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Principal E-Leadership Practices and Teacher Attitude toward Using the Frog VLE

E-Kepimpinan Pengetua dan Sikap Guru terhadap Penggunaan Frog VLE

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Abstract

This study investigates the relationship between principal e-leadership practices and teacher attitude toward using the Frog VLE a virtual learning platform and the moderating effect of secondary school teachers' demographic characteristics in Klang district, Selangor. This is a non-experimental research using a cross-sectional survey technique through administration of a questionnaire. A total of 351 sets of the questionnaires were collected. The findings of this study indicated that the teachers in the study showed medium level of attitude and they perceived that their principals demonstrating medium level of e-leadership practices. It is confirmed that there is statistically significant weak but positive correlation between principal e-leadership practices and teacher attitude toward using Frog VLE. Gender, age, computer experiences and teaching experience are not the significant moderator of the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE.

Keywords: *e-leadership practices, attitude toward using Frog VLE, virtual learning platform, demographic characteristics, secondary school*

Introduction

The advancement of ICT in knowledge economy has triggered the need for systemic changes in public schools (Flanagan & Jacobsen, 2003). A successful technology integration transformation in school is vital for teachers to fit themselves in a situation where their students are 21st-century learners who are capable, independent technology users and can create inspiring digital masterpieces (Blair, 2012). This is further supported by Moyle (2010) states *"learning with technologies raises the right issues and should provoke valuable dialogue among those seriously concerned about educational reform"* (pg. vi). There was a general consensus on the issue regarding Malaysia education reform. A report published by the ASLI-CPPS, PROHAM, & KITA-UKM in the year 2012 states *"the last education reform under the Razak Report 1956 is outdated and does not reflect the current educational needs of a new generation of young people in the 21st century"* (p.3). Thus, a tremendous amount of money has been invested by the Malaysia government in educational reform and implementation of ICT in school.

In 2012, Malaysia Education Blueprint 2013-2025 was introduced to develop a new education vision in Malaysia's education system. In accordance with the

government's vision of giving quality internet-enabled education for all, Ministry of Education Malaysia (MOE) had initiated a project known as 1BestariNet to equip all 10,000 schools in Malaysia with the Internet-based Virtual Learning Environment (Frog VLE). The 1BestariNet Project was an initiative undertaken by the MOE and completed in association with YTL Communications Sdn. Bhd. to substitute and upgrade ICT availability in schools (National Audit Department, 2014). Hiong & Umbit (2015) stated that 1BestariNet project not simply served as a noteworthy impetus for internet penetration in Malaysia, however, increases national income of the country as well.

Under the project, schools will be equipped with an integrated solution allowing teaching, learning, collaboration and administrative functions to take place through the Internet-based Virtual Learning Environment (Frog VLE) and a high-speed connectivity. The usages of Frog VLE in all Malaysian schools are now under tremendous pressure to improve. Principals' e-leadership and teachers' attitude toward using Frog VLE is a research avenue which must be extensively explored with the anticipation that the findings will enhance existing practices or increase the usage of Frog VLE. Specifically, this proposed study examined the relationship between secondary school principals' e-leadership practices with teachers' attitude toward using the Frog VLE in the Klang district, Selangor. Teachers' demographic characteristics such as gender, age, computer experiences and teaching experiences were chosen as moderating variables.

Statements of problem

Under the 1BestariNet project, the government will fork out a total of RM3 billion over 15 years to pay for the 4G network infrastructure and the maintenance of the Frog VLE (Malay Mail Online, 2014). However, according to the 2013 Auditor-General's Report, Series 3, the level of VLE usage by teachers, students and parents were very low which is in the range of 0.01% to 4.69% (Ministry of Finance., 2014). This indicates that there appears to be an unexplained gap between the high levels of expenditure on educational technology and the expected return in the usage of Frog VLE. Despite greater access to ICT in schools, there is still a wide gap between technology presence and use in the classroom and schools (Cuban, Kirkpatrick, & Peck, 2001; Fong, Ch'ng, & Por, 2013; Lim, Zhao, Tondeur, Chai, & Tsai, 2013).

Giving an answer to that, principals and teachers in the school are believed to have the most responsibility in ensuring high usage of Frog VLE. Mishra, Henriksen, Boltz, & Richardson (2016) stated that ICT-enabled economy is creating a new context for leadership where long established theories of leadership may be necessary but it is not sufficient for successful leadership practices in ICT-mediated environments. The migration of leadership to e-leadership has been considered necessary in shielding any reform endeavors (Avolio & Kahai, 2003). Furthermore, Husing et al. (2013) noted that in order to be competitive in today's global digital economy, a

new type of leadership known as e-leadership is becoming essential to organizational innovation and competitiveness. Thus, it is now vital that the school principal effectively leads the school through a process that is mediated by ICT and be an e-leader that influence people to carry out the mission and vision of the school (Chang, 2012).

However, without teachers' genuine efforts, it does not seem possible to effectively integrate technology in school. Most studies suggested positive attitudes of teachers as part of prominent components to the success implementation of ICT in school (Afshari, Bakar, Luan, Samah, & Fooi, 2009; Demirci, 2009; Harrison & Rainer, 1992; Teo, 2008; Williams, 2015; Yildirim, 2000). In other words, if teachers see no need to change, they will not use ICT in the classroom or carry out their daily routine work through Frog VLE. Teachers need to understand that technologies will benefit them in order to use the technology tools (Becta, 2004). Indeed, introducing new technology tools or virtual learning environment is not sufficient to promote action. Teachers need to perceive that the application of the new virtual learning environment is feasible and desirable. Hence, it is the interest of this study to find out the level of teachers' attitudes toward using the Frog VLE in secondary public school in Klang district.

On the other hand, many studies focus on implementation and usage of Frog VLE in Malaysian schools (Ana Haziqah, 2014; Ching, 2014; Chua & Chua, 2017a; Hiong & Umbit, 2015; Junus, 2013; Kamaruddin, 2014; Kaur & Hussein, 2015; Mohamad Ali, 2015) but only Chua & Chua's (2017a) study relate to the role of a school leader in implementing Frog VLE effectively. In addition, most of the academic literature on virtual learning environment is from Higher Education institution (Fan, Chen, Wang, & Chen, 2014; Hiong & Umbit, 2015; Jameson, 2013; Liaw & Huang, 2003; Liaw, Huang, & Chen, 2007; Wong & Hanafi, 2007). This dearth of information concerning the use of virtual learning environment in higher education aroused interest in the researcher to embark on this study in lower level education institution such as secondary schools. This is further supported by Ofsted Survey (2009), it showed that secondary schools surveyed on VLE were less concerned and the use of VLE in secondary schools was limited. The researcher foresees that there is a need to study the implementation of virtual learning environment specifically Frog VLE in secondary schools.

Furthermore, there are relatively little understanding in e-leadership and the literature in this field is scarce (Avolio, Sosik, Kahai, & Baker, 2014; DasGupta, 2011; Hambley, O'Neill, & Kline, 2007; Hanna, 2007; Jameson, 2013). We are clear about the role of principal leadership and teachers' attitude toward increasing the usage of ICT in school but what we need to clarify here is regarding the direct relationship of principals' e-leadership to point as a central role to be played in overall teachers'

attitude toward using the Frog VLE. Since there is no research on principals' e-leadership to point as a central role to be played in overall teachers' attitude toward using the Frog VLE in Malaysia context, this study investigates the relationship between principal e-leadership practices and teacher attitude toward using the Frog VLE in Klang district, Selangor secondary school.

Kusano et al. (2013) and Williams (2015) stated that gender, computer experiences, teaching experiences and age variables are some of the important predictors of end user's attitudes toward using educational technology innovations. Previous studies have indicated that there is significant correlation between teachers use of ICT in school with demographic variables such as gender (Cakir, 2014; Hung & Hsu, 2007; Kusano et al., 2013; Li & Kirkup, 2007; van Braak, Tondeur, & Valcke, 2004), age (Abedalaziz, Jamaluddin, & Chin, 2013; Cakir, 2014; Cavas, Cavas, Karaoglan, & Kisla, 2009; Hung & Hsu, 2007), computer experience (Cavas et al., 2009; van Braak et al., 2004) and teaching experiences (Albirini, 2006; Becker, 1999; Christensen, 1997; Kusano et al., 2013; Sadik, 2006). It has been difficult to demonstrate consistent results with regard to the demographic variables (gender, age, teaching experiences, and computer experiences) as antecedents to teachers' attitude toward using ICT in school and the amount of research on the proposed moderators (gender, age, teaching experiences, and computer experiences) on the relationship between principals' e-leadership practices and teachers' attitude has been rather limited. Hence, it is important to examine the moderating effect of gender, age, teaching experiences and computer experiences on the relationship between principals' e-leadership practices and teachers' attitude toward using Frog VLE.

Research objectives

This study aims to investigate teachers' perception of the level of principal e-leadership practices and teacher attitude toward using Frog VLE in Klang district secondary schools. The objectives of this study are as follows:

1. To identify the level of school principal e-leadership practices toward using the Frog VLE in Klang district secondary schools.
2. To identify the level of teacher attitude toward using the Frog VLE in Klang district secondary schools.
3. To identify the relationship between principals' e-leadership practices and teachers' attitudes toward using the Frog VLE in Klang district secondary schools.
4. To assess the moderating effect of teacher demographic variables such as gender, age, teaching experiences and computer experiences on the relationship between principals' e-leadership with teachers' attitudes toward using the Frog VLE in Klang district secondary schools.

Conceptual framework

Transformational leadership theory was used to study the effects of leader behaviour on followers' empowerment, performances, commitment and motivation (Mees, 2008). Transformational leaders connect with the goals of followers, energize their enthusiasm, raise their motivations and build their desire for collective individual mastery over the capacities needed to accomplish such goals (Leithwood & Jantzi, 2006). Building upon Leithwood & Jantzi's (2006) transformational leadership model it is assumed that principal e-leadership practices will have an effect on teachers' attitudes toward using the Frog VLE. Furthermore, there is evidence showed that there is a link between principals' e-leadership practices and teachers' attitude toward using the ICT (Aarons, 2006; Adegbesan, 2013; Avolio et al., 2000; Avolio et al., 2009; Fan et al., 2014; Hambley et al., 2007; Kelloway et al., 2003; Kim, 2011; Kursunoglu & Tanrıogen, 2009; Lai & Yin, 1997; Liaw et al., 2007; Ling & Ibrahim, 2013; Mees, 2008; Ottestad, 2013; Preston et al., 2014; Ran, 2008).

Thus, based on previous research and theory, the conceptual framework of this study is built and is depicted in Figure 1. This study aimed at examining the relationship between principal e-leadership practices (independent variable) and teacher attitude toward using the Frog VLE (dependent variable) and the moderating effect of secondary school teachers' demographic characteristics (gender, age, computer experiences and teaching experience).

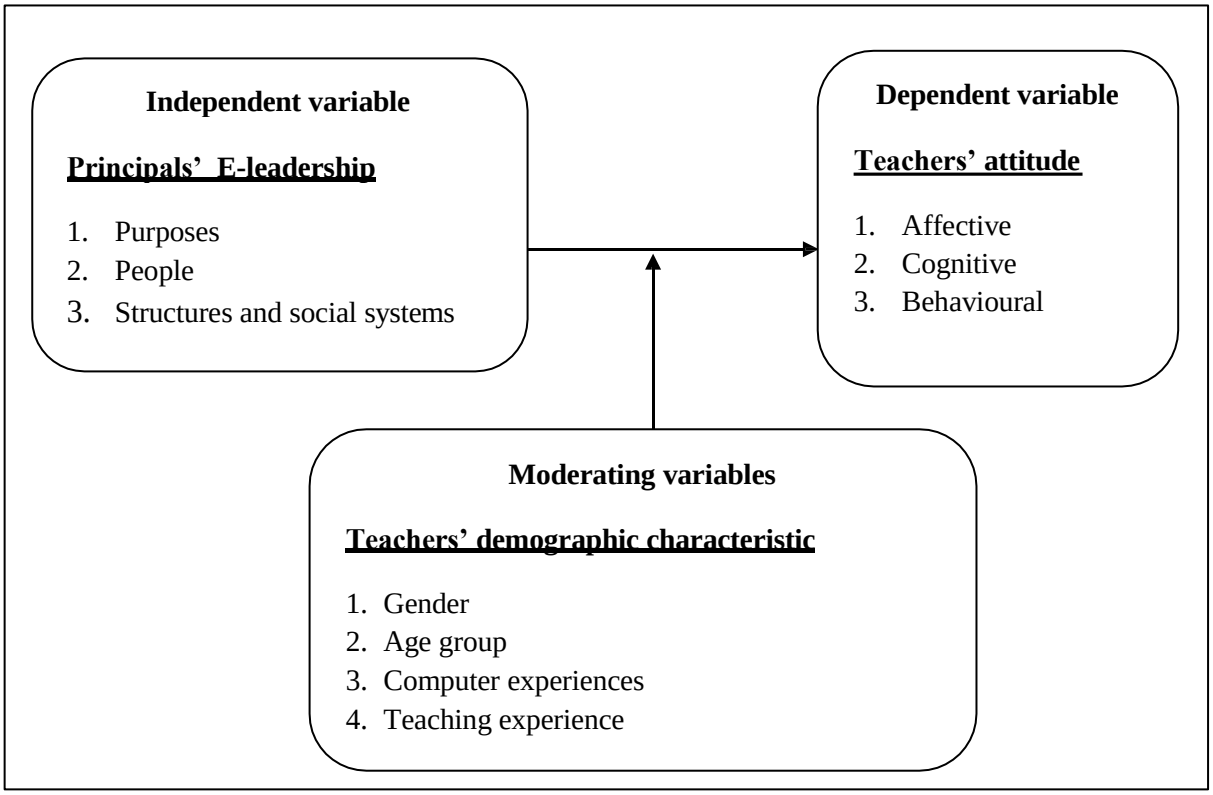


Figure 1: Conceptual Framework of the Study

Methodology

Research design

The core purpose of this study is to investigate the relationship between teachers' perception of principal e-leadership practices and teacher attitude toward using Frog VLE in Klang district secondary schools. The independent variable of this study is principals' e-leadership practices based on three different dimensions such as purposes, people and structures and social systems whereas the dependent variable of the study is teachers' attitude toward using the Frog VLE that describe the three aspects such as affective, cognitive and behavioural. Teachers' demographic characteristics such as gender, age, computer experiences and teaching experiences are the moderating variables. This is a non-experimental research using a cross-sectional survey technique through administration of the questionnaire.

Population and Sample of the study

The target population for this study was comprised of all daily public secondary school teachers in Klang district, Selangor, Malaysia. 34 daily public secondary schools in Klang district will be the target population of this study with a total of 3931 teachers. A total of 454 teachers from 34 daily public secondary schools in Klang district were randomly selected to participate in this study and a total of 383 subjects responded to the study with a response rate of 84.4%. Based on Krejcie & Morgan's (1970), the minimum number of respondents needed for this study at 95% confidence level is 351 teachers. Hence, only 351 questionnaires collected were randomly selected using select cases program in SPSS for analysis.

Instrumentation

A questionnaire will be developed by the researcher as an instrument to obtain information needed for the study because this study applied quantitative research method to explain the relationship between variables. The survey questionnaire used in this study consisted of three section that corresponds to the demographic characteristics of a teacher such as gender, age, computer experiences and teaching experience (Section A) and two main variables namely principals' e-leadership practices (Section B) and teachers' attitude toward using Frog VLE (Section C). There was a total of 28 items for Section A (4 items), B (13 items) and C (11 items).

The instrument used in this study was adapted from various established findings based on quantitative research and developed by the researcher by referring to various studies. By referring to Heck & Hallinger (1999)(purposes, people and structures and social systems leadership categories), Jameson (2013) (e-leadership framework), Leithwood & Jantzi (2006) (school specific model of transformational

leadership practices), Leithwood, Seashore Louis, Anderson, & Wahlstrom (2004) (transformational leadership theory) and Politis & Politis (2011) (e-leadership construct) work, researcher developed a 13 items questionnaire to investigate the relationship between principals' e-leadership practices. E-leadership construct of principals is measured from 3 different dimensions, namely, 'purpose, 'people', and 'structures and social systems'.

Teachers' attitude toward using Frog VLE scale was adapted from Albirini's (2006) 'Teachers' attitudes toward ICT in education' questionnaire which will be measured according to teachers self-rated based on the three components of teachers' attitude items, namely, affective, cognitive and behavioural.

The instrument developed was pilot tested by 34 teachers from one secondary school in Petaling Jaya, Selangor. They were chosen randomly to do the pilot test and they were not a part of the final study. The data was analyzed using Statistical Package for the Social Sciences (SPSS) software (version 21.0) to calculate the Cronbach's Alpha coefficient. Results indicated that Cronbach Alpha for the principals' e-leadership dimensions was in the range of .780 to .807 and teachers' attitude toward using Frog VLE dimensions were in the range of .760 to .883. Hence, in can be concluded that the instrument developed for this study showed a very good level of internal consistency reliability.

Analysis of Data

Statistical Package for Social Sciences (SPSS) version 21.0 and Smart PLS 2 are used to analyze the numerical data collected from the respondents in this study quantitatively. Generally, three different statistical analysis procedures would be carried out to answer each of the research questions. The first two research questions to be answered by descriptive statistics in term of mean and standard deviation. Research question three is to be answered by the inferential statistic in term of Spearman's -rho tests which help to identify the relationship between variables. Lastly, structural equation modeling (SEM) procedures with Smart PLS 2 were carried out to assess the moderating effect of teacher demographic variables such as gender, age, teaching experiences and computer experiences on the relationship between principals e-leadership with teachers attitudes toward using the Frog VLE in Klang district secondary schools.

Besides, SEM analysis was performed to run normality test and to test the validity and reliability of the model. Firstly, the convergent validity and discriminant validity for all variables in the model were examined and followed by examining the composite reliability and Cronbach's alpha internal consistency reliability of the variables.

Findings

Preliminary Analysis of Data: Normality Test for the Data Distribution

Multivariate normality test for principal e-leadership practices and teacher attitude toward using Frog VLE of the study is conducted through SEM and is reported in Table 1.

Table 1: Value of the Multivariate Critical Ratio for Each Variable

Variable	Univariate Normality		Multivariare c.r.
	Skewness	Kurtosis	
Attitude	-.220	.116	64.625
Affective	-.012	.324	17.236
Cognitive	-.390	.602	38.271
Behavioural	-.010	-.252	12.893
E-leadership	.023	-.355	53.595
Purpose	-.610	.110	24.978
People	.053	-.828	38.214
Structure and Social System	.177	-.626	22.182

Table 1 indicated that the data for the variables principals' e-leadership practices and teachers' attitude toward using Frog VLE are normally distributed for univariate normality (skewness and kurtosis values) which is in the range of -1.96 to +1.96 (Chua, 2013). However, the value of the multivariate critical ratio for each variable and each dimension was above 8.00 which is in the range of 12.893 to 67.508 showed that the data are not normally distributed for multivariate normality. In order to achieve multivariate normality, all the items in a proposed model that involved in an analysis need to achieve the benchmark for multivariate normality where the value of the multivariate critical ratio needs to be less than 8.00 (Chua & Chua, 2017a). Hence, all the items as proposed in the model of this study do not achieve the benchmark for multivariate normality. According to Chua & Chua (2017b), PLS-SEM is a non-parametric model testing analysis where the data of the items collected for the analysis does not need to be normally distributed. Thus, in this study, the data can be presented descriptively using the mean score (univariate normality achieved) but the data cannot be analyzed using parametric tests (multivariate normality does not achieve). Non-parametric tests were used to analyze the data.

Preliminary Analysis of Data: Validity and Reliability of the Variables

According to Chua & Chua (2017b), validity and reliability of the variables (constructs) in the model using PLS-SEM analysis should be established prior to

further data analysis. In order to achieve convergent validity, the loadings of the items for each variable should be greater than .50 and the average variance extracted (AVE) for the variable should be greater than .50 (Hair, Hult, Ringle, & Sarstedt, 2016). Besides, the authors added that in order to achieve reliability, both the values of composite reliability and Cronbach's alpha should be greater than .70. The output of the validity and reliability analysis for the variables principal e-leadership practices and teachers' attitude toward using Frog VLE are presented in Table 2. The results show that both principal e-leadership practices and teachers' attitude toward using Frog VLE achieved their construct validity. In addition, both values of composite reliability and Cronbach's alpha internal consistency reliability are greater than .70, the reliability of principal e-leadership practices and teacher attitude toward using Frog VLE is achieved.

Table 2: Validity and Reliability of the Variables

Latent variables	Items	Convergent validity		Reliability	
		Loading	AVE	Composite Reliability	Cronbach's Alpha Reliability
Attitude	C1	0.561***			
Affective	C2	0.833***	.6630	.8517	.7364
	C3	0.826***			
Cognitive	C4	0.764***			
	C5	0.871***	.6814	.9186	.8812
	C6	0.839***			
	C7	0.868***			
Behavioural	C8	0.834***			
	C9	0.863***	.6429	.8780	.8141
	C10	0.675***			
	C11	0.832***			
E-Leadership	B1	0.828***			
Purpose	B2	0.771***			
	B3	0.852***	.7034	.9220	.8946
	B4	0.840***			
	B5	0.898***			
People	B6	0.824***			
	B7	0.906***			
	B8	0.888***	.6875	.9357	.9074
	B9	0.848***			
Structure and	B10	0.694***			
Social System	B11	0.762***			
	B12	0.844***	.6098	.8620	.7840
	B13	0.815***			

*** significant at p< 0.01.

Discriminant validity can be identified by assessing the inter-correlations among the variables in a reflective model (Garson, 2016). According to Chua & Chua (2017b), in order to achieve discriminant validity of a construct, the inter-correlations among the variables in the model should be smaller than .90. With the value of inter-correlations among the variables in the model smaller than .90 indicated that there is no overlapping of concept and the variables do not have a significant multi-collinearity problem (Bryne, 2010). As illustrated in Table 3 and Table 4, all the indicators in measuring principal e-leadership practices and teacher attitude toward using Frog VLE do not have significant multicollinearity problem. Thus, the discriminant validity of all the items in measuring principal e-leadership practices and teacher attitude toward using Frog VLE is achieved.

Table 3: Inter-correlations of Teacher Attitude toward Using Frog VLE

Variable	Affective	Attitude	Behavioural	Cognitive
Affective	1.0000			
Attitude	0.8910	1.0000		
Behavioural	0.6609	0.8370	1.0000	
Cognitive	0.7198	0.8922	0.5618	1.0000

Table 4: Inter-correlations of Principal E-Leadership Practices toward Using Frog VLE

Variable	People	Purpose	Structure and Social System	E-Leadership
People	1.0000			
Purpose	0.4886	1.0000		
Structure and Social System	0.8086	0.5215	1.0000	
E-Leadership	0.8977	0.7846	0.8929	1.0000

Results

The levels of school principal e-leadership practices toward using the Frog VLE

The descriptive analysis results in term of mean and standard deviation are reported in Table 5. The summated scale of 0 to 10 was used to assess the level of principals' e-leadership practices and teacher attitude toward using Frog VLE. The interpretation for level according to mean is divided into low, medium and high with an equal interval.

Table 5: Mean, Standard Deviation and the Level of Principal E-Leadership toward Using Frog VLE (N=351)

Dimension	Mean	Standard Deviation	Level
1) Purpose	7.13	1.66	High
2) People	4.09	2.46	Medium
3) Structure and Social System	4.76	1.91	Medium
Overall	5.32	1.73	Medium

As illustrated in Table 5, the overall mean of principal e-leadership practices toward using Frog VLE is 5.32. This could be interpreted that majority of the respondents perceived that their principals demonstrated medium level of e-leadership practices in Klang district secondary schools. Results indicated that there is only one dimension out of three dimensions of principal e-leadership practices have a higher mean than the overall mean (M=5.32, S.D.=1.73) which are the dimension purpose (M=7.13, S.D.=1.66). On the other hand, dimension people (M=4.09, S.D.=2.46) and structure and social system (M=4.76, S.D.=1.91) have a lower mean than the overall mean. Purpose dimension has a mean that is interpreted as high level, however, both people and structure and social system dimension have a mean that is interpreted as medium level.

The levels of teacher attitude toward using the Frog VLE

The descriptive analysis yield results are presented in Table 6.

Table 6: Mean, Standard Deviation and the Level of Teacher Attitude toward Using Frog VLE (N=351)

Dimension	Mean	Standard Deviation	Level
1) Affective	5.88	2.04	Medium
2) Cognitive	5.72	2.04	Medium
3) Behavioural	5.12	2.16	Medium
Overall	5.57	1.80	Medium

Referring to Table 6, the overall mean for teacher attitude toward using Frog VLE is 5.57. This could be interpreted as medium level of teacher attitude toward using Frog VLE in Klang district secondary schools. The results of the analysis for each of the teacher attitude toward using Frog VLE dimensions indicated that all the three dimensions namely, affective (M=5.88, S.D.=2.04); cognitive (M=5.72, S.D.=2.04); and behavioural (M=5.12, S.D.=2.16) showed medium level of mean.

Relationship between principals' e-leadership practices and teachers' attitudes toward using the Frog VLE

Since the data collected does not achieve in terms of multivariate normality, the data cannot be analyzed using parametric tests. Hence, Spearman's -rho tests were performed to identify the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE.

Table 7: Spearman's Rho Correlation Analysis between Principal E-Leadership Practices and Teacher Attitude toward Using Frog VLE

Variable		Teacher Attitude toward using Frog VLE
Principal E-Leadership Practices	Spearman's rho Correlation	.411**
	Sig. (2-tailed)	.000

** Correlation is significant at the 0.01 level (2-tailed)

As illustrated in Table 7, there is statistically significant positive correlation (r=.411, p<.01) between principal e-leadership practices (M=5.32, S.D.=1.73) and teacher attitude toward using Frog VLE (M=5.57, S.D.=1.80). The correlation coefficient of r=.411 indicated that the correlation strength between principal e-leadership practices and teacher attitude toward using Frog VLE is weak.

Moderation effects of selected demographic variables on the relationship between principals' e-leadership and teachers' attitudes toward using the Frog VLE

Moderating variable is the variable that affects the direction or the strength of the relation between an independent variable and a dependent variable (Baron & Kenny, 1986). PLS-SEM was used to perform the moderation analysis in this study. It was utilized to test the direct and moderating relationship between principal e-leadership practices (independent variable), teacher attitude toward using Frog VLE (dependent variable); and teachers' demographic characteristics such as gender, age, computer experiences and teaching experiences (moderating variable).

First, a total effect model is presented by showing there is significant total effect of principal e-leadership practices on teacher attitude toward using Frog VLE using bootstrapping. Figure 2 indicated that principal e-leadership having a significant total effect on teacher attitude toward using Frog VLE. Then, a moderation model includes the moderating variable is presented and the significance of the direct and moderating effect is then checked using bootstrapping. The moderating effect is

measured through t-statistics as PLS-SEM generates t-statistics for significance testing between interaction effect of the moderator and the independent variables on the dependent variables. If the interaction effect is significant, the moderator has a significant moderating effect on the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE. Hence, it could be concluded that the moderating effect exists and the moderator could be confirmed as a significant moderator. The analysis yield results as shown in Table 5.

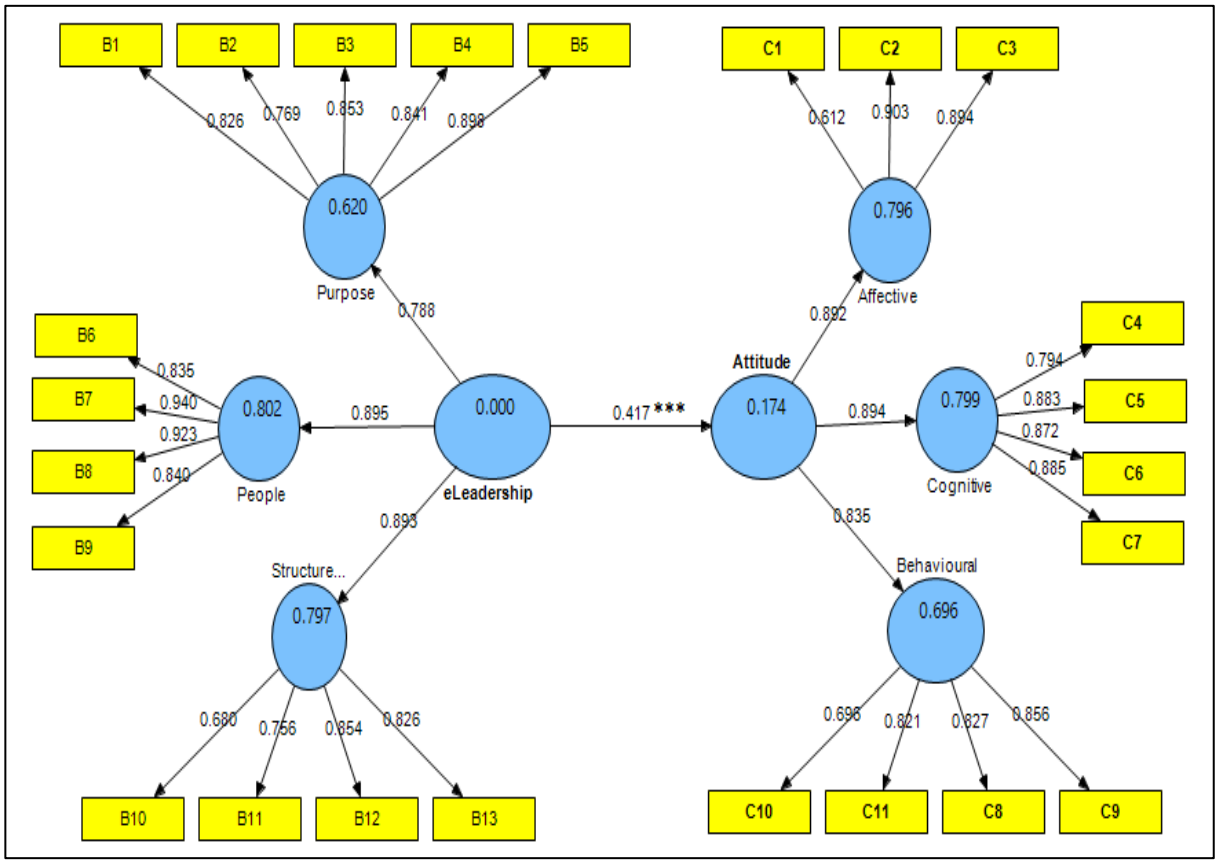
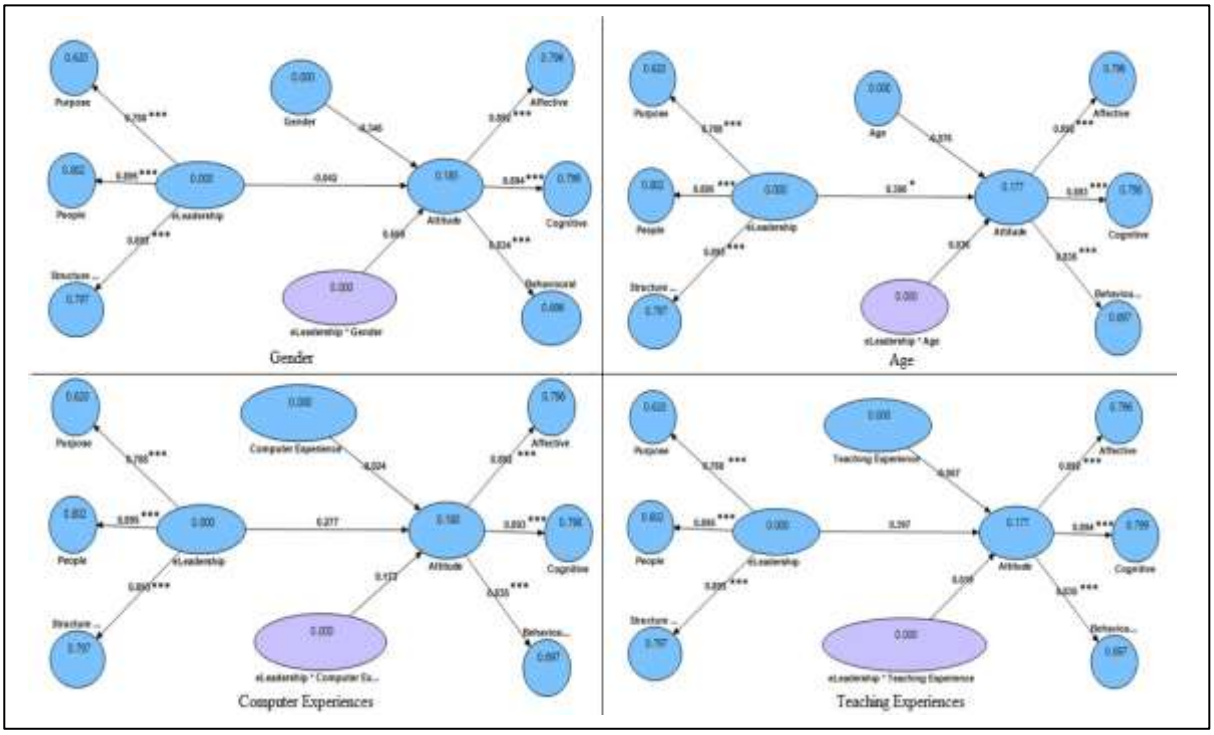


Figure 2: Total Effect Model of Principal E-Leadership Practices on Teacher Attitude toward Using Frog VLE

Table 5: T-statistics of Gender, Age, Computer Experiences and Teaching Experiences as Moderator Variable on the Relationship between Principal E- Leadership Practices and Teacher Attitude toward Using Frog VLE

Regression Path			T-statistics (Bootstrapping value)	Result
E-leadership *Gender	→	Attitude	0.9492	Not Significant
E-leadership *Age	→	Attitude	0.1444	Not Significant
E-leadership* Computer Experience	→	Attitude	0.4143	Not Significant
E-leadership * Teaching Experience	→	Attitude	0.0632	Not Significant

Based on Table 5, it showed that the interaction between principals' e-leadership practices and gender, age, computer experiences and teaching experiences were not statistically significant. This indicated that there were no statistically significant differences of gender, age, computer experiences and teaching experience on the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE. Hence, gender, age, computer experiences and teaching experience are not the significant moderator of the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE. Moderation model for gender, age, computer experience and teaching experience on the relationship between principal e-leadership practices and teacher attitude toward using Frog VLE are depicted in Figure 3.



Note: *Significant at p<.05; **Significant at p<.01; ***Significant at p<.001

Figure 3: Moderation effects of demographic variables

Discussions

"A school's internal administration is no longer a closed-circuit system but rather a dynamic educational ecology" (Chang, 2012, p.337). Schools can no longer ignore the influence of technological development outside of the school. In particular, schools in the digital age can no longer face the rapidly changing world with an attitude that hopes to preserve the past. Similarly, the role of the principal has also changed as the arrival of ICT has affected the roles and responsibilities of school principals in huge ways (Ibrahim et al., 2013). The findings of the present study indicated that teachers perceived that their principal demonstrated medium level of e-leadership practices.

This finding reflected that the respondents have higher expectations from their school principals as an e-leader. According to Adu & Olatundun (2013); Blau & Presser (2013) and Vázquez Cano (2013), successful e-leaders are those who able to delegate responsibilities and enhance collaboration between followers. It is thus suggested that school leaders need to bear some responsibility for enhancing the usage of Frog VLE through principal-teacher collaboration.

Technological advancement has put on greater pressure on the shoulder of teachers to engage with various types of technology tools in preparing, delivering and conceptualizing their ways of instruction (Teo, 2015). However, without teachers' genuine efforts and positive attitude it does not seem possible to effectively integrate ICT in school (Celep & Tülübaş, 2014). The findings indicated that teachers in Klang district, Selangor secondary schools showed medium level of attitude toward using Frog VLE. This was supported by both Chai et al. (2009) and Tezci (2010) indicated that teachers in their study demonstrated medium level of attitude toward the computer. Furthermore, the findings of this research confirm those of Afshari et al. (2009), Albirini (2006), Cakir (2014), Celep & Tülübaş (2014), Demirci (2009), Harrison & Rainer (1992), Kandasamy & Shah (2013), Teo (2008), Williams (2015), Yildirim (2000), and Yunus (2007) on computers and the Internet. These researches concluded that teachers had positive attitudes toward using educational technology innovations. On the other hand, the findings of this research are contradicted to Samuel & Zaitun (2007) findings which indicated that teachers possessed negative attitudes and they were generally unwilling to integrate ICT tools into the classroom.

Leaders is a crucial starting point to change the context where there is a chance that they can change a person's belief and behaviour (Fullan, 2003). In simple words, principals' leadership is the key factor to influence teachers' attitudes and is a success factor to increase the usage of Frog VLE as a tool to help teachers to carry out their daily practices. The Spearman's rho correlation analysis showed that there is statistically significant weak but positive correlation between principal e-leadership practices and teacher attitude toward using Frog VLE. The significant positive correlation is consistent with the previous studies (e.g., Aarons, 2006; Adegbesan, 2013; Goos & Bennison, 2008; Kelloway et al., 2003; Kim, 2011; Kursunoglu & Tanrıogen, 2009; Lai & Yin, 1997; Liaw et al., 2007; Ling & Ibrahim, 2013; Ottestad, 2013). This can be explained by Leithwood & Jantzi (2006) transformational leadership theory which indicated that leadership is a social influence process that has an impact on followers' attitudes, behaviours and performance.

Lastly, the present study showed that demographic variables such as gender, age, computer experiences and teaching experiences are not statistically significant moderators on the relationship between principal e-leadership practices and teachers' attitudes toward using the Frog VLE in Klang district secondary schools. This reflected that teachers' perception about whether their principals are able to demonstrate

e-leadership practices to inculcate positive attitudes toward using the Frog VLE among the teachers are not affected by their demographic characteristics such as gender, age, computer experiences and teaching experiences. This is supported by Leong's et al. (2016) findings stated that teachers' gender, age and computer experiences are not the moderators on the relationship between principal technology leadership practices and teacher acceptance and use of school management system. On the other hand, several literature indicated that there is statistically significant difference between teachers' perceptions of principals' leadership with their teaching experience (Chang, Chin, & Hsu, 2008; Orr, 1990; Tahir, Rahman, Yassin, & Ling, 2010), gender (Orr, 1990; Tahir et al., 2010; Wanlabeh, 2011) and age (Chang et al., 2008; Orr, 1990; Tahir et al., 2010; Wanlabeh, 2011) which showed contradicting findings from this study.

Conclusion

The findings of this study showed that teachers in the Klang district secondary schools showed medium level of attitude and perceived that their principals demonstrated medium level of e-leadership practices. The findings also confirmed that there is statistically significant positive correlation between principal e-leadership practices and teacher attitude toward using Frog VLE. Besides, teacher demographic characteristics such as gender, age, computer experience and teaching experience are not the moderators. This present study has numerous implications and contributions to the body of knowledge on technology integration and pedagogical innovations.

Finally, further research in e-leadership practices and teachers' attitudes are recommended to be conducted in other locations to provide clearer pictures of the relationship between these variables as the findings of this study are limited to the characteristics of the samples from Klang district secondary schools and the virtual learning platform known as Frog VLE.

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