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What Influence Malaysian Teachers' Satisfaction towards the FROG Virtual Learning Environment? A Structural Equation Modelling

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Abstract: The purpose of this paper is to determine teachers' perceptions towards factors that influence their satisfaction towards a learning management system in Malaysia. A survey which involved 350 teachers from three states and the focus of the study was to investigate factors that influence satisfaction towards the FROG Virtual Learning Environment (VLE) in the teaching and learning among the Champion Secondary Schools teachers. The factors were computer anxiety, computer attitude and internet self-efficacy, training, technical support, school management perceive, usefulness, perceived ease of use, flexibility and interaction in studying FROG VLE's characteristics. The study was based on a quantitative method with correlational research design. The study involved 350 respondents who were selected using the proportionate stratified cluster sampling. There were four significant paths in influencing satisfaction which are the internet self-efficacy, computer attitude, training, and flexibility.

Keywords: FROG VLE, satisfaction, teachers, Malaysia

1. Introduction

The Malaysian Education Policy Review conducted by UNESCO (2013) reported Malaysia as lagging behind in terms of technology integration in education in comparison to many other countries in the region. Improving and empowering teachers and school leadership was given top priority under the Malaysian Education Blueprint 2013-2025 (MEB). Educators including school principals need to realise the importance of equipping themselves with new technologies in the 21st learning environments (Afshari, Bakar, Luan & Siraj, 2012). MEB is a detailed plan of actions that maps out the education landscape for the next 13 years (2013-2025). Under the MEB, 1BestariNet Project was initiated in order to leverage on the Internet and technology use to bridge the digital divide between the rural and urban schools. A single virtual learning platform known as the FROG Virtual Learning Environment (FROG VLE), and a high-speed 4G connectivity were provided to all the schools in Malaysia. This virtual learning platform linked the six million school children from 10,000 schools in the area of 329, 847 km with 4.5 million parents and teachers (Hew & Kadir, 2016).

2. Literature Review

Implementation of any virtual learning environment (VLE) can be expensive to any organisations due to the relatively low adoption rate among users. This is because there is a low widespread change in pedagogic practices despite the varied functionality afforded by the VLE (Becker & Jokivirta, 2007). Concerns are being raised regarding the economic cost of implementing and maintaining the infrastructure in order to sustain the integration of technology into the classrooms (Dutta & Bilbao-Osorio, 2012). Given the increasing availability and reliance of technology in the modern world, there is a dire need to understand factors that can help lead us to sustain and increase its adoption (Yee, Luan, Ayub & Mahmud, 2009). Reasons as to why it worked or failed to work need to be understood.

Numerous past research have revealed that satisfaction is among the most important factor in the success of system implementation (Martin-Rodriguez & Fernandez-Molina, 2014) for reason being that it ensures continued usage of the system (Joo & Choi, 2016). For this reason, it would make sense that when teachers are satisfied with the FROG VLE, they will continue using it even after its initial implementation. Teachers shared vision and commitment for the initial uptake of innovative learning technology and continuation of e-learning initiatives in schools are critically needed.

2.1 Rationale of the Study

Despite the massive expenditure and enthusiasm by the MOE, a report by the Auditor-General's (A-G) report (National Audit Department, 2014) revealed that usage of the FROG VLE by teachers, students and parents was between 0.01 and 4.69 percent while daily utilisation of the VLE by teachers was found to be between 0.01 and 0.03 percent. This seems to suggest that the VLE is underused or unused by most of the teachers.

As past studies have found that satisfaction does influence teachers' continuation of web-based learning system usage (Al-Busaidi & Al-Shihi, 2012; Sun, Tsai, Finger, Chen & Yeh, 2008) and has been used as a dependent variable in e-learning research (Teo, 2014; Teo & Wong, 2013), it must also be considered in our local context. At the same time, variables like computer attitude (Yu & Yang, 2006), computer self-efficacy (Chen, Yeh, Lou & Lin, 2013), computer anxiety (Ozkan & Koseler, 2009), perceived usefulness (Teo, 2014), perceived ease of use (Teo, 2014), interaction (Martin-Rodriguez, Molina, Alonso & Gomez, 2014), flexibility (Ho, Nakamori, Ho & Lim, 2016), management support (Ho, Nakamori, Ho & Lim, 2016), training (Aggelidis & Chatzoglou, 2012), and technical support (Ozkan & Koseler, 2009) have been found to influence satisfaction towards a learning management system. Past researchers have revealed that satisfaction is among the most important factors in the success of system implementation and it is influenced by the different facets of user satisfaction that can be attributed to various dimensions: teachers' factors, system design and environmental factors (Wang & Bagakas, 2003). Given the high stakes in e-learning and the growing reliance on technologies in education, there is a dire need for a research to be done in Malaysia to probe the determinants of satisfaction that would entice teachers to accept and continue to use FROG VLE in their teaching and learning processes. Only when teachers are using the FROG VLE can we expect a change in the teaching and learning environment.

2.2 Objective and Hypotheses of the Study

Given the aforesaid context and the dearth of information on studies related to FROG VLE in Malaysian schools, it is therefore, pertinent that a study on factors that influence satisfaction towards the FROG VLE be conducted in Malaysian schools. The independent variables used in this study are based on previous studies which include perceived usefulness, perceived ease of use, interaction, flexibility, computer attitude, computer anxiety, internet self-efficacy, technical support, training and school management. The following hypotheses were formulated as shown in Table 2.

Table 2: Hypotheses of the study

H_1 Computer Attitude has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning	H_6 Interaction has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning
H_2 Internet Self-Efficacy has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning	H_7 Flexibility has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning
H_3 Computer Anxiety has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning	H_8 School management support has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning
H_4 Perceived Usefulness has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning	H_9 Training has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning
H_5 Perceived Ease of Use has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning	H_{10} Technical support has a significant influence on teachers' satisfaction towards the FROG VLE in teaching and learning

3. Methodology

3.1 Sampling and Instrumentation

The population in this study are teachers from the 27 Champion FROG VLE secondary schools located in the southern region from the states of Negeri Sembilan, Melaka and Johor. The FROG VLE Champion schools are schools listed in Malaysia as the benchmarked schools, acting as mentors to the others (Hew & Kadir, 2016). These schools were selected so as to ensure that all the teachers involved in the study are using the FROG VLE in their classrooms. There are 155 secondary schools in the whole of Malaysia which are listed in the Champion list. The sample consists of 350 teachers; 25 males and 60 female teachers in Negeri Sembilan, 24 males and 60 females in Melaka while 49 males and 132 female teachers from Johor which are proportionally represented according to the population studied.

The questionnaire comprised 132 items on a 5-point Likert scale with 1 representing "strongly disagree" and 5 representing "strongly agree" for positive items (and vice versa for negative items). Table 3 shows the internal consistency of the instrument. Cronbach's alpha coefficient was utilised to determine reliability of the questionnaire. The Cronbach's alpha ranged from .98 to .92 which revealed that the internal consistency estimation appeared adequate and above the cutoff value of .70 (Nunnally, 1978).

Table 3: Internal consistency of items for actual study

Scale	Cronbach's alpha
Peceived Usefulness	.98
Flexibility	.97
Perceived Ease of Use	.96
Interaction	.96
Computer Attitude	.92
Internet Self-Efficacy	.96
Computer Anxiety	.97
School Management	.92
Technical Support	.95
Training	.96
Satisfaction	.98

4. Model Fit

Structural equation modeling (SEM) was performed to test the fit between the research model and the obtained data through AMOS software Version 22. SEM is suitable for theory testing and confirmation where there are strong theoretical foundations and hypotheses that are driven by model fitness. Table 3 shows the level of acceptable fit and the fit indices for the proposed research model. In the case of x^2, it has been found to be sensitive to sample size differences, especially for cases in which the sample size exceeds 200. As such, this anomaly is assumed to be applicable in the present study with a sample of 350. However, the results of the other fit indices shows a good fit for the proposed research model.

Table 3: Fit Indices of the proposed research model

Fit Index	Recommended Level of Fit	Proposed Research Model
x^2	P value > .05	1678.276
x^2/df	< 5	1.9
GFI	> 0.90	.826
CFI	> 0.90	.956
NFI	> 0.90	.912
TLI	> 0.90	.950
RMSEA	$0.05 \leq \text{RMSEA} \leq 0.10$	.051

Figure 1 shows the resulting path coefficients of the proposed research model. Four out of the ten hypotheses were supported by the data. The results showed:

1. significant influence of computer attitude on teachers' satisfaction towards the Frog VLE (ß = 0.08, p < 0.05);
2. significant influence of internet self-efficacy on teachers' satisfaction towards the FROG VLE (ß = 0.11, p < 0.05);
3. no significant influence of computer anxiety on teachers' satisfaction towards the FROG VLE (ß = -0.04, p > 0.05);
4. no significant influence of perceived usefulness on teachers' satisfaction towards the FROG VLE (ß = 0.13, p > 0.05);
5. no significant influence of perceived ease of use on teachers' satisfaction towards the FROG VLE (ß = -0.04, p > 0.05);
6. no significant influence of interaction on teachers' satisfaction towards the FROG VLE (ß = 0.03, p > 0.05);
7. significant influence of flexibility on teachers' satisfaction towards the FROG VLE (ß = 0.16, p < 0.05);
8. no significant influence of school management on teachers' satisfaction towards the FROG VLE (ß = -0.11, p > 0.05);
9. significant influence on training on teachers' satisfaction towards the FROG VLE (ß = 0.48, p < 0.05);
10. no significant influence of technical support on teachers' satisfaction towards the Frog VLE (ß = 0.02, p > 0.05).

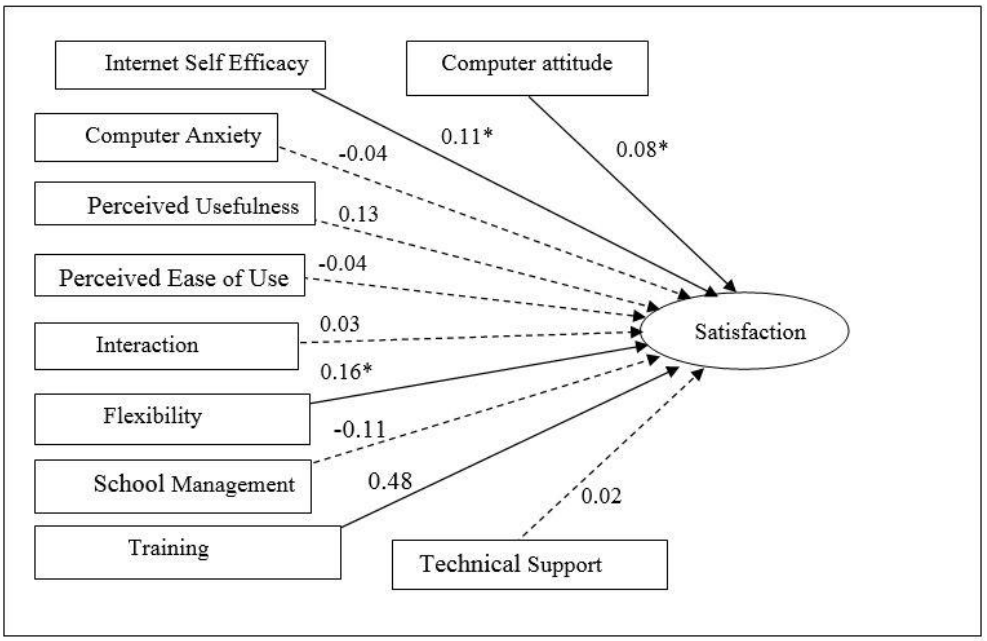

Figure 1: Path Coefficients of the proposed research model

5. Discussion

The resulting model is an adequate fit to the investigated factors that are believed to influence satisfaction since 86% of the variance in satisfaction was explained by the four constructs (computer attitude, internet self-efficacy, flexibility and training).

Training was found to have a significant effect on satisfaction. This suggests that with training, teachers are more likely to be satisfied towards the FROG VLE. This finding is similar to those of Khasawneh and Yaseen (2017) who found a strong correlation between training and satisfaction. The results also suggest that internet self-efficacy has a significant influence on satisfaction. This implies that with more confidence and believe towards their own capabilities in handling usage of working on the internet, teachers will be more satisfied towards the FROG VLE. Flexibility is also significant in this study. Arbaugh (2002) found flexibility as one of the main factors that influence learner satisfaction

in an online learning environment. Results from the analysis also seem to suggest that Computer Attitudes has an influence on satisfaction towards Frog VLE. This is in line with the findings by Sun, Tsai, Finger, Chen and Yeh (2008) who found that it is an important element in predicting satisfaction among e-learner volunteers. Perceived usefulness does not have a direct effect on teachers' satisfaction towards the FROG VLE. This contradicts the studies by Stockless (2018), and Chen (2010) who found that perceived usefulness influenced their respondents' satisfaction. Perceived ease of use is found to be insignificant in this study. This contradicts many previous studies which suggest otherwise like in Arbaugh and Duray (2002) and Wu, Hsia, Liao and Tennyson (2008). The results also indicated that Interaction was not significant to influence satisfaction towards the FROG VLE. This is in direct contrast to the findings by Ramayah and Lee (2012) who found interaction to be an antecedent of satisfaction towards online instructional courses. Computer Anxiety was not found to have a significant effect on satisfaction. With the many ICT projects by the MOE over the past nearly thirty years, they have enabled our teachers to be competent in at least the basic ICT skills, thus leading them to overcome their anxiety. Lastly, school management and technical support are not significant in the analysis. This contradicts Thurmond, Wambach, Connors and Frey (2002) who in their studies claimed that environmental factors were highly predictive on whether or not users were satisfied with the web-based lessons.

6. Conclusion

The challenge in the ICT scenario in Malaysian education system is to get teachers to want to use FROG VLE considering the large amount of money spent. As this study seemed to suggest, stakeholders especially the MOE need to pay more attention to teachers' Internet Self-efficacy, Computer Attitude, Training and Flexibility as these have been found to play more important roles in influencing teachers' satisfaction.

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