Primary School Science Teachers' Attitude Towards Using Virtual Learning Environment (VLE) In Teaching Science

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Abstract

The aim of this study is to identify the attitude of science teachers towards the usage of Frog VLE in teaching and learning primary science. The sample consisted of 148 science teachers in Cameron Highlands and Taiping (45 male and 103 female). Data is collected by questionnaire which contains 40 questions with 5 Likert scale. The independent t test and One-way ANOVA is used to answer the research questions. Findings indicated that the science teachers in Cameron Highlands and Taiping have neutral attitude towards the usage of Frog VLE in teaching primary science. There are no any significant differences in the attitude towards Frog VLE among science teachers between male and female. Teachers with less experience (younger teacher) have greater attitude compared to old teachers. Science teachers with higher professional grade have greater attitude compared to the teachers with lower professional grade. Hence, science teachers are encouraged to attend courses and develop skills in using Frog VLE to increase their attitude in usage of Frog VLE in teaching science.

Keywords: science teacher, IT, science education, Frog VLE.

Introduction

In the current globalised era, teaching approach in Malaysia changed from teacher centred to student centred learning mechanism. Teacher centred is mainly focused on content whereas student centred learning gives autonomy to students to seek knowledge and construct meaning from gained information and previous experience (Kasim, 2014). Many programmes had been introduced in order to utilize ICT in education such as Smart School Roadmaps and Policy on Education 2010. Integration of ICT into very idea of teaching and learning always places pedagogy over technology (Majumdar, 2006).

In the Malaysian Education Blueprint 2013- 2025 stated about the globalised online learning which explains teacher's role in integrating ICT in teaching and learning process. It is clear that Malaysian government emphasise the innovation in ICT to improve teaching and learning processes.

Teachers usually face some difficulties in delivering and conducting a lesson which is suitable for these three group of students. One way to solve such situation is create interactive multimedia based instructional materials where learner is given control to review the topic at their own pace. Students will get the chance to learn the same subject, same topic but with different pace using ICT. Students can learn better with technology environment as they are very interested in technology applications in this era. With the presence of ICT in education, teachers and students can explore wider knowledge without bound in limited curriculum and resources. Students able to find more information about a subject.

Technology innovations in education lead to the application of new methods and instruments in teaching and learning process. Frog virtual learning environment is one of the method introduced to fulfil the needs in education in Malaysia based on Malaysian Education Blueprint. Frog virtual learning environment is a teaching method under "1 Bestari Net Project". It uses high speed wireless broadband, Yes 4G. It is introduced to schools by MoE in 2011 (National Audit Department, 2014).

VLE is a network provides access to learning resources, online storage and communication tool first developed in UK. Teachers, parents and students are users of VLE. Teaching and learning, collaboration among learners and educators, administrative functions can be done through VLE. It can be accessed in schools and from anywhere else with internet connection. VLE is important for learners to share ideas and resources.

Virtual Learning Environment (VLE) is a system for delivering learning materials to students via the web. These systems include assessment, student tracking, and collaboration and communication tools. In Malaysia, the program called Frof Virtual Learning Environment (Frog VLE) is emphasised by Ministry of Education to be implemented in the teaching and learning process at school. Frog VLE. Frog VLE is a pedagogical component in teaching and learning which initiated by 1BestariNet. Frog VLE is developed for the use of students, teachers and parents in Malaysia to improve the education as a step of succeed the Vision 2020. It is a platform where students can do online studies, parents monitor their children's studies and teachers to encourage students' learning at home and also all the time.

Attitude is the way of thinking and feeling about certain thing which is reflected by a person's behaviour. The attitude can be positive, neutral and negative. The positive attitude is showing interest, motivation and agree with certain things. Negative attitude is showing the unhappiness, disagree and have feeling of against to certain things. Neutral is a feeling where do not have either positive or negative feelings.

There is a relationship between attitude and effort. Attitude is significantly associated with the effort taken by individuals (Lilian, 2012). In this research, positive attitude towards Frog VLE indicates that the teachers likely and highly motivated in using Frog VLE in making science lesson a success. Teachers with positive attitude collaborate with colleagues to enhance the usage of Frog VLE, maximise the usage and have the tendency to use during science lesson. Conversely, negative attitude towards Frog VLE is the unlikely feelings and less motivated to implement Frog VLE in science. Teachers with negative attitude feel Frog VLE is time consuming, not beneficial, not confident and refuse to use it during lesson. Neutral attitude shows towards Frog VLE indicates that teachers do not find Frog VLE is beneficial or unbeneficial. 5 Likert scale is divided into three to find the attitude of teachers. The mean score of 1 to 1.7 is considered to be negative attitude, 1.8 to 3.4 is considered as neutral attitude and 3.5 to 5 is considered positive attitude.

Problem Statement

Malaysian Ministry of Education, 2014 (MoE), (p.213), VLE usage by teachers, students and parents was very low, that is, between 0.01% and 4,69%. This shows that there is not expected return from the government's investment in that project. Many courses and guidelines given to teachers to improve and increase the usage of VLE in schools. In spite of completing the Frog VLE training, a number of teachers failed to use it in their daily teaching and learning process. (Hussein, 2015). Teachers play important role in implementing VLE in schools. They are the instructors in classroom. Their motivation and guidance affecting the usage of VLE among students. It is important to study the factors affecting the use of Frog VLE among science teachers in Pahang and Perak, so that they can show positive attitude towards the usage of Frog VLE. This study aimed to know the perception of teacher's in Frog VLE.

According to the results of research done by Barker & Gossman (2013), virtual learning environment has a positive impact on students learning. It increases the students' motivation to learn, promotes communication and collaborative learning. ICT have a profound impact on the process of learning in higher education by offering possibilities for learners and teachers which have an impact on students' performance and achievement (Yousseff, 2008).

Research Questions

According to the problem statement and aims, researcher fixed some research questions as followed:

What are the attitudes of science teachers in using VLE?

What are the differences of the science teachers' attitude in using VLE according to their gender?

What are the differences of the science teachers' attitude in using VLE according to their experience?

What are the differences of the science teachers' attitude in using VLE according to their qualifications?

Research Methods

A descriptive research methodology was used for this research. In this research, researcher used quantitative research. A survey was conducted to a selected sample from the population of science teachers in Cameron Highlands and Taiping.

Population and research sampling

Science teachers from Cameron Highlands and Taiping are involved in this research. According to the information gained from district education office in Cameron Highlands and Taiping, there are 25 primary schools in Cameron Highlands and 27 primary schools in Taiping. There are 235 teachers teaching science in the year of 2017. There are 80 teachers in Cameron Highlands and 155 in Taiping. The sample consisted of 148 science teachers in Cameron Highlands and Taiping (45 male "30%" and 103 female "70%"). Teachers are divided into three groups according to the age group. The following three group established: less than 30 (age 1), 31 to 45 (age 2), more than 45 (age 3). According to their teaching experience, four groups were established as follows: less than 5 years (TE1), 6-10 (TE2), 11-20 (TE3), more than 20 (TE4). Teachers with the experience of 1-5 years are the most which is 45.9%. They are the newly posted teachers after training. Only 14.9% of the teachers from the sample have experience of more than 20 years. They are nearly retired. 20.3% of the primary science teachers are teaching science for 6 to 10 years. Teachers who have teaching experience of 11 to 20 years is 18.90%.

Research Instrument

In this research questionnaire is used as instrument to collect primary school science teachers' response. The questionnaire contains 40 questions with 31 positive items and 9 negative items. The evaluation of the negative items is in reverse order. 5 Likert scale is used in the questionnaire. Likert scale questions comprised five points ranking which are 5 (strongly agree), 4 (agree), 3 (neutral), (2 disagree), 1 (strongly disagree).

A pilot test is done on 50 respondents who were teaching science in primary school. 30 of them are in Cameron Highlands and 20 in Taiping. The 18 male teachers form 36% of the sample and the 32 female participants form 64% of the sample. The result of Split-half reliability test and Cronbach's alpha is the measurement of reliability was calculated for the scales for the items. The split half reliability test result is 0.960 for the first twenty questions, 0.845 for the last twenty items and Cronbach's alpha is 0.954 for the attitude towards usage of Frog VLE. The Spearman Brown coefficient is 0.901. The results of reliability test show the Cronbach's alpha value of 0.954. The instrument has a good reliability and can be used to measure primary science teachers' attitude towards usage of Frog VLE in Science teaching and learning.

Results

Research question 1: science teachers' attitude in using VLE

Descriptive statistics has been used to reflect science teachers' attitude towards usage of Frog Virtual Learning Environment. The mean score less than 1.7 is considered to be negative attitude, 1.8 to 3.4 is considered as neutral attitude and 3.5 to 5 is considered positive attitude.

Table 4.5

Mean scores for the domains in usage of Frog VLE

Domain	Mean	SD	Attitude
1. Frog VLE is used in instructional	3.30	0.57	neutral
2. Confidence in using Frog VLE	3.20	0.66	neutral
3. Encouragement from colleagues	3.31	0.80	neutral
4. Frog VLE socialization	3.09	0.49	neutral
5. Frog VLE relative advantage.	3.43	0.71	neutral
6. Complexity in using Frog VLE	3.12	0.63	neutral
7. Barriers in using Frog VLE	3.23	0.67	neutral
Total	3.27	0.53	neutral

All the items indicate that the science teachers in Cameron Highlands and Taiping have neutral attitude in using Frog VLE in teaching science for all the domains. Primary school science teachers have slightly negative attitude in using Frog VLE to improve socialization among teachers and students.

Research question 2: The differences of attitude in using VLE according to the gender.

An independent sample t-test was conducted to compare primary school science teachers' attitude towards usage of Frog VLE for male and female (Table 4.6).

Table 4.6

Independent sample t-test: Attitude towards usage of Frog VLE by gender

Domain	Mean		SD		df	t-test	Sig.
	Male	Female	Male	Female			
1	3.26	3.32	0.60	0.56	146	-0.55	0.24
2	3.14	3.23	0.64	0.67	146	-0.74	0.54
3	3.29	3.32	0.83	0.80	146	-0.22	0.57
4	3.02	3.12	0.41	0.52	146	-.1.07	0.06
5	3.35	3.46	0.76	0.69	146	-0.87	0.70
6	3.07	3.14	0.71	0.60	146	-0.60	0.34
7	3.17	3.25	0.72	0.65	146	-0.72	0.29
TOTAL	3.22	3.29	0.54	0.53	146	-0.74	0.49

As table 4.6 indicates, there was no significant difference in the teachers' attitude in domains and in general for the total according to their gender. These results suggest that both male and female have the same attitude towards the usage of Frog VLE in teaching science for primary children.

Research question 3: The differences of attitude in using VLE according to science teachers' experience.

A one way ANOVA was conducted to explore the attitude of primary schools science teachers on the usage of Frog VLE in teaching science according to their experience level. The result is presented in Table 4.7.

Table 4.7

ANOVA Table: Science teachers' attitude on usage of Frog VLE according to their experience.

		Sum of Squares	df	Mean Square	F	Sig.
1	Between Groups	2.47	3	0.82	2.63	.052
	Within Groups	44.79	143	0.31		
	Total	47.26	146			
2	Between Groups	3.35	3	1.12	2.66	.051
	Within Groups	60.64	144	0.42		
	Total	64.00	147			
3	Between Groups	8.58	3	2.86	4.75	.003
	Within Groups	86.63	144	0.60		
	Total	95.20	147			
4	Between Groups	2.23	3	0.74	3.19	.026
	Within Groups	33.63	144	0.23		
	Total	35.86	147			
5	Between Groups	4.39	3	1.46	2.99	.033
	Within Groups	70.39	144	0.49		
	Total	74.78	147			
6	Between Groups	3.18	3	1.06	2.74	.046
	Within Groups	55.74	144	0.39		
	Total	58.92	147			
7	Between Groups	3.67	3	1.22	2.83	.041
	Within Groups	62.37	144	0.43		
	Total	66.04	147			

There was not a significant difference of experience level of primary science teachers on their attitude towards Frog VLE in domain 1 at $p < .05$ level for the three condition [$F(3, 143) = 2.631$, $p = 0.052$].

There was not a significant difference of experience level of primary science teachers on the attitude towards Frog VLE in domain 2 at p< .05 level for the three condition [F (3, 144) = 2.655, p= 0.051].

There was significant effect of attitude towards usage of Frog VLE in teaching science for primary children in domain 3 at the p< .05 level for the three conditions [F (3, 144) =4.751, p = 0.03. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for less 5 years experience (M= 3.53, SD= .767) was significantly different than the experience of 11-20 years (M= 3.04, SD= .827) and more 20 years of experience (M=2.93, SD= .942). However, the experience of 6-10 years (M= 3.35, SD= .589) did not significantly differ from the less 5 years, 11-20 years and more than 20 years.

There was significant effect of attitude towards usage of Frog VLE in teaching science for primary children in domain 4 at the p< .05 level for the three conditions [F (3, 144) =3.186, p = 0.026. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for less 5 years experience (M= 3.01, SD= .573) was significantly different than the experience of 11-20 years (M= 3.34, SD= .545). However, the experience of 6-10 years (M= 3.03, SD= .292), more than 20 years (M= 3.07, SD= .234) did not significantly differ from the experience of less than 5 years.

There was significant effect of attitude towards usage of Frog VLE in teaching science for primary children in domain 6 at the p< .05 level for the three conditions [F (3, 144) =2.239, p = 0.046. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for 6-10 years experience (M= 3.33, SD= .411) was significantly different than the experience of more 20 years (M= 2.83, SD= .711). However, the experience of less than 5 years (M= 3.13, SD= .654), 11 to 20 years (M= 3.11, SD= .655) did not significantly differ from the 6-10 years of experience.

There was significant effect of attitude towards usage of Frog VLE in teaching science for primary children in domain 5 at the p< .05 level for the three conditons [F (3, 144) =2.993, p = 0.033.

There was significant effect of attitude towards usage of Frog VLE in teaching science for primary children in domain 7 at the p< .05 level for the three conditons [F (3, 144) =2.825, p = 0.041.

It can be concluded that the less the experience level, the more the attitude of science teachers in using Frog VLE in teaching science for primary kids.

Research question 4: The differences of attitude in using VLE according to science teachers' professional grade.

A one way ANOVA was conducted to explore the attitude of primary schools science teachers on the usage of Frog VLE in teaching science according to their professional grade. The result is presented in Table 4.9.

Table 4.9

ANOVA Table: Attitude of teachers according to their professional grade

		Sum of Squares	df	Mean Square	F	Sig.
A	Between Groups	2.39	2	1.19	3.83	.024
	Within Groups	44.87	144	0.31		
	Total	47.26	146			
B	Between Groups	2.72	2	1.36	3.21	.043
	Within Groups	61.28	145	0.42		
	Total	64.00	147			
C	Between Groups	6.31	2	3.15	5.14	.007
	Within Groups	88.90	145	0.61		
	Total	95.20	147			
D	Between Groups	0.48	2	0.24	0.99	.376
	Within Groups	35.38	145	0.24		
	Total	35.86	147			
E	Between Groups	3.44	2	1.72	3.50	.033
	Within Groups	71.34	145	0.49		
	Total	74.78	147			
F	Between Groups	5.20	2	2.60	7.02	.001
	Within Groups	53.72	145	0.37		
	Total	58.92	147			
G	Between Groups	3.23	2	1.61	3.73	.026
	Within Groups	62.81	145	0.43		
	Total	66.04	147			

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 1 at the p< .05 level for the three conditions [F (2, 144) = 3.832, p = 0.024. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 44 to 52 (M= 3.48, SD= .420) was significantly different than the professional grade of DG 29 to 38 (M= 3.01, SD= .867). However, the professional grade of DG 41/42 (M= 3.32, SD= .502) did not significantly differ from the professional grade of DG 44 to 52 and DG 29 to 38.

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 2 at the p< .05 level for the three conditions [F (2, 145) = 3.212, p = 0.043. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 44 to 52 (M= 3.43, SD= .608) was significantly different than the professional grade of DG 29 to 38 (M= 2.92, SD= .943). However, the professional grade of DG 41/42 (M= 3.21, SD= .587) did not significantly differ from the professional grade of DG 44 to 52 and DG 29 to 38.

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 3 at the p< .05 level for the three conditions [F (2, 145) = 5.143, p = 0.007. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 41/42 (M= 3.38, SD= 0.774) and DG 44 to 52 (M= 3.48, SD= .0.595) was significantly different than the professional grade of DG 29 to 38 (M= 2.81, SD= .968).

There was not a significant difference of professional grade of primary science teachers on their attitude towards Frog VLE in domain 4 at p< .05 level for the three condition [F (2, 145) = .985, p= 0.376].

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 5 at the p< .05 level for the three conditions [F (2, 145) = 3.498, p = 0.033. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 41/42 (M= 3.47, SD= 0.702) was significantly different than the professional grade of DG 29 to 38 (M= 3.06, SD= .844). However, the professional grade of DG 44 to 52 (M= 3.56, SD= .506) did not significantly differ from the professional grade of DG 41/ 42 and DG 29 to 38.

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 6 at the p< .05 level for the three conditions [F (2, 145) = 7.015, p = 0.001. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 41/42 (M= 3.14, SD= 0.594) and DG 44 to 52 (M= 3.43, SD= 0.563) was significantly different than the professional grade of DG 29 to 38 (M= 2.73, SD= .720). The professional grade of DG41/42 did not significantly differ from professional grade of DG 44 to 52.

There was significant effect of professional grade on primary science teachers' attitude towards usage of Frog VLE in teaching science for primary children in domain 7 at the p< .05 level for the three conditions [F (2, 145) = 3.726, p = 0.026. Post hoc comparisons using Scheffe test indicated that the mean score for teachers' attitude for professional grade of DG 44 to 52 (M= 3.53, SD= .653) was significantly different than the professional grade of DG 29 to 38 (M= 2.96, SD= .734). However, the professional grade of DG 41/42 (M= 3.22, SD= .637) did not significantly differ from the professional grade of DG 44 to 52 and DG 29 to 38.

It can be concluded that the primary school science teachers have higher attitude correspond with the higher professional grade, which is higher qualification.

Conclusion

Primary science teachers have neutral attitude towards the usage of Frog VLE in teaching science. Teachers do not understand the importance of implementing Frog

VLE in teaching and learning science. They could not understand the reason the government introduced Frog VLE in education.

Male and Female primary school's science teachers have the same attitude towards usage of Frog VLE in teaching science. Both male and female science teachers show neutral attitude towards Frog VLE.

Primary science teachers with less experience have greater attitude towards usage of Frog VLE in teaching science. This teachers with less experience are young teachers with the higher competency in ICT as ICT being a part of their education and life. Teachers with less than 5 years of experience have greater attitude on usage of Frog VLE especially in the domain 3 (encouragement from colleagues) compared to the teachers with 11 to 20 years and more than 20 years of experience. In the domain 4 (Frog VLE socialization), science teachers with less than 5 years of experience have more attitude than teachers with 11 to 20 years of experience.

Science teachers in primary school with higher professional grade have greater attitude compared to the teachers with lower professional grade. The teachers with higher professional grade are more qualified and most of them awarded for their performance in the professional. They have the intention to learn new programs and try to adapt themselves to the changes in the education.

Discussion

This study shows that science teachers have neutral attitude towards the usage of Frog VLE which is an element of ICT. This is different from other studies such as the results found by (Mai, 2015) (Angadi, 2013) (Singh, 2012), which stated that science teachers have positive attitude towards ICT. Hussein (2015) stated in the research on Frog VLE that only small number of teachers have positive attitude towards the usage of Frog VLE and the workload, time consumption and the slow internet access are might be the reasons for the teachers' negative attitude.

This study shows that male and female have same attitudes toward Frog VLE. Similar results shown in the research done by (CAVAS, 2009) stated that male and female have same perception on ICT. The results discussed by (Beacham, 2012) in the research on student teachers attitude and beliefs towards using ICT, stated that male had significantly greater positive attitudes towards ICT than female student teachers. It is because male teachers have more experience on ICT whereas female teachers are more anxious and lack of confident in using ICT. Female teachers facing difficulties in handling technical errors during the usage of ICT. Another research which showed the same results is the research done by (Singh, 2012) in India on attitude of teachers towards ICT and he stated that the mean score of males is higher than the females. It means male have greater positive attitude than female teachers.

The study done by (CAVAS, 2009) (Komis, 2006) (Beacham, 2012) (Singh, 2012) on science teachers' attitude toward ICT in education, they found that science teachers

shows the same results found in this research. It stated that science teachers have positive attitude because almost 65% of the teachers are young individuals with the age of below 35. The young teachers might have higher experience with ICT as they use it during their education and training.

Teachers with higher professional grade shows positive attitude towards usage of Frog VLE compared to the lower professional grade teachers (ungraduated teachers). It is because the science teachers with higher professional grade attends more courses and training on ICT as they are increasing their qualification in teaching profession (CAVAS, 2009), (Fu, 2013).

In an overall view, it can be concluded that all primary science teachers in Cameron Highlands and Taiping have neutral attitude in using Frog virtual learning environment in teaching science. There is no differences between the attitude in using VLE in teaching science between male and female primary science teachers. Primary science teachers from younger generation have more positive attitude towards Frog VLE compared to the teachers from older generation. Teachers with higher qualification (professional grade) have more positive attitude towards using Frog VLE in teaching science compared to the lower qualification.

Suggestion

Based on the findings from this research, researcher would suggest the following:

Teachers should increase their attitude towards Frog VLE by optimising its benefits in teaching and learning process.

Primary science teachers should attend the courses related to Frog VLE to increase their skills on it.

Headmasters should encourage science teachers to use Frog VLE in teaching science.

Ministry of Education to organise more courses and workshops on Frog VLE for the primary science teachers.

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