

## Students' Perception towards the Use of Frog VLE Based on Rogers' Diffusion of Innovation Theory

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### ABSTRACT

In the Malaysia Education Blueprint or PPPM 2013-2025, Frog VLE Application is a new application introduced by the Ministry of Education Malaysia as a new approach to education at all schools. Therefore, this study is conducted to identify whether there is a significant correlation between the advantages, compatibility, complexity and observation of Roger's Diffusion of Innovation theory with the perceived usefulness of Frog VLE and the perceived ease of use of Frog VLE based on TAM Model in teaching and learning. Respondents were comprised of 30 Form 5 Science students and 30 Form 5 Arts students from a secondary school in Tangkak District. The research instrument used was a questionnaire consisting of 24 questions related to the relationship between DOI Roger theory and TAM model on the application of Frog VLE. The data were analysed quantitatively using the Statistical Package for the Social Sciences (SPSS Version 20.0) which involved the use of descriptive, and Pearson's correlation methods. The findings showed that the significant correlation between DOI Roger theory and TAM model on the application of Frog VLE application was at moderate level.

### Keywords

Virtual Learning, Frog VLE, Technology Acceptance Model (TAM), Roger's Diffusion of Innovation

### Introduction

Malaysia Education Blueprint seeks to bridge the Digital Gap between access to ICT facilities and the mastery of ICT skills among students and teachers. In fact, Ministry of Education has worked hard to ensure adequate infrastructure, tools, software and training to be given to schools in the less ICT exposure areas (Junus, 2013). In addition, schools are linked with access to School net broadband Internet. Access centres have also been constructed in some rural and remote schools. Accordingly, the first wave of Malaysia Education Blueprint began in 2013 to 2015, when the ministry focused on enhancing ICT based on 1BestariNet.

Under this project, it was expected that ten thousand primary and secondary schools across the country would be equipped with 4G Internet & Virtual Learning Environment (VLE) by the end of 2013. In Malaysia, virtual learning for primary school students is a new learning concept but in other countries such as the United Kingdom, Ireland, United States, Hong Kong and Singapore VLE have long been set up and practised (Khasiman, 2013). With the cooperation of YTL Communication, the Ministry of Education Malaysia (MOE) has allocated more than 1 million Ringgit Malaysia to obtain Frog VLE license until 2015 from the company that developed this platform in the United Kingdom (Junus, 2013).

Frog VLE is not only accessible to computers, but can also be accessed by using any electronic devices that have Internet networks such as cell phones and tablets. This government initiative will make Malaysia the first country in the world equipped with 4G mobile Internet access and existing VLE in all schools throughout Malaysia. Therefore, this topic is important and relevant to study on the students' perception towards the use of Frog VLE.

### Purpose of the Study

Technology that is used to relay and convey information to many people regardless of distance is known as the Information and Communication Technology (Wise, et, al.). The use of ICT by educators in teaching and learning can improve the quality and effectiveness of teaching and learning (Cox, 2012) by motivating and engaging students during the process of learning. However, in Malaysia, teaching and learning are still carried out formally and conventionally by educators in the classroom (Ida, 2013; Ebrahimi and Jiar, 2018). Finding shows that teaching and learning process without using ICT result in less engagement from the students. Hence, Malaysia Education

Blueprint is enhancing ICT in ten thousands of primary and secondary schools across the country to promote student-centred learning environment where students can have more active participation in learning rather than more listening without understanding of the topic discussed (Noor, 2013). Now that the Frog VLE has been implement for 5 years since 2013, new research should be carried out to get the clear feedback from students towards the use of Frog VLE.

## Conceptual Framework

Technology Acceptance Model (TAM) is a model that is often used by researchers to analyse and address the correlation between acceptance and intention besides understanding the factors which influence the perception towards computer technology that was introduced by Davis in 1986. Factors such as Perceived of Ease of Use is defined as the stage in which a person believes that using a particular application will help to reduce his burden (Davis, 1989) while Perceived of Usefulness means the benefits gained when using technology. Additionally, Roger's Diffusion of Innovation Theory (DOI) explains how, why and what new ideas and technologies are spread through social culture. DOI is one of the latest technology acceptance models to survey the virtual learning in teaching & learning (Davis, 1989).

## Research Objective

The objectives of this study are to:

- i. Determine the correlation between the advantages with the students' *Perceived of Usefulness* and *Perceived of Ease-of-Use* of Frog VLE.
- ii. Determine the correlation between the compatibility with the students' *Perceived of Usefulness* and *Perceived of Ease-of-Use* of Frog VLE.
- iii. Determine the correlation between the complexity with the students' *Perceived of Usefulness* and *Perceived of Ease-of-Use* of Frog VLE.

## Methodology

This study is a quantitative study that can give a general understanding based on research objectives. The data and information were collected through a questionnaire to answer the questions related to the students' acceptance perception towards the use of Frog VLE. For this study, a set of questionnaire for students was developed for collecting information on the use of Frog VLE application at schools. The use of questionnaire to the students has provided extensive information as the questionnaire can be administered to a large number of survey respondents within a short period of time. The population involved was the students of a secondary school in Tangkak District. Samples consisted of 30 Form Five Science students and 30 Form Five Arts students of the chosen School. Gender, age, and ethnic variables were not taken into account in this study. The sample for this study consisted of students who had Frog VLE accounts and had been exposed by virtual learning through the Frog VLE programme. The total items of the questionnaire were 24 items and the questionnaire was modified from the study conducted by Mazlan (2014).

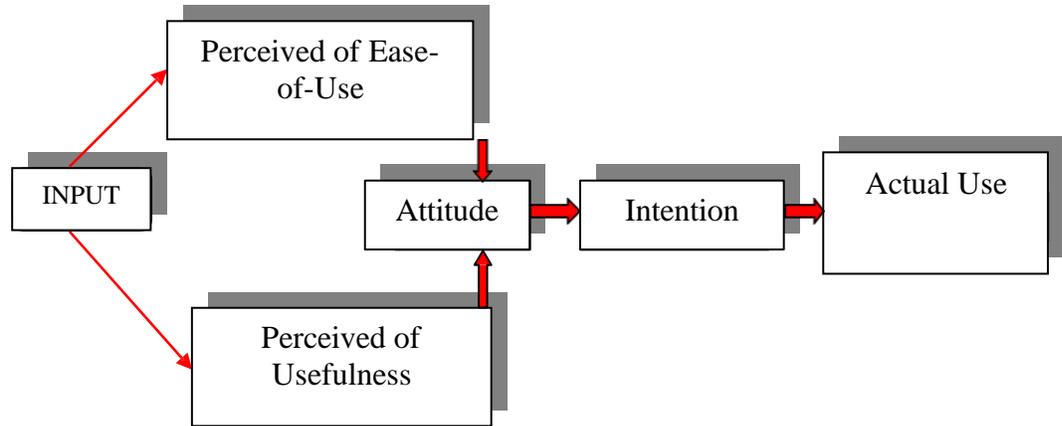


Figure 1.

### Research Findings

The researcher identified mean for Roger’s DOI constructs and TAM model constructs by using descriptive statistics.

**Table 1.** Mean of Advantages, Compatibility, Complexity, Observation, Perceived of Usefulness and Perceived of Ease of Use of Frog VLE

| No | Construct                | Mean | Standard Deviation |
|----|--------------------------|------|--------------------|
| 1  | Advantages               | 3.37 | 0.780              |
| 2  | Compatibility            | 3.52 | 0.676              |
| 3  | Complexity               | 3.38 | 0.804              |
| 4  | Observation              | 3.15 | 0.880              |
| 5  | Perceived of Usefulness  | 3.27 | 0.880              |
| 6  | Perceived of Ease of Use | 3.17 | 0.905              |

Frequency analysis showed that mean of advantages construct was at the moderate level which was 3.37 with the standard deviation of 0.780. Furthermore the mean of the compatibility construct was at the high level, which was 3.52 with the standard deviation of 0.676. In addition, the mean of complexity construct was at moderate level, which was 3.38 with a standard deviation of 0.804. Related to this, the mean of observation construct was at the high mean value which was 3.14 with the standard deviation of 0.996. Meanwhile, the mean of Perceived of Usefulness was at the moderate level of 3.27 with standard deviation of 0.880. Finally, mean of Perceived of Ease-of-Use construct was at the moderate level with a value of 3.17 and a standard deviation of 0.905. In summary, the five constructs recorded a moderate mean level and only one construct reached a high level of mean which was the compatibility construct with the mean higher than 3.50 level which was 3.52.

According to the results of the survey, Roger's Diffusion of Innovation Theory (construct of DOI, 1983) with TAM (Davis, 1989) is a major factor in influencing attitudes and intention of using technology. Consequently, respondents' acceptance and use of Frog VLE applications are studied based on the four major constructs of advantages, compatibility, complexity and observation with the Perceived of Usefulness and the Perceived of Ease-of-Use of the Frog VLE application directly affecting the attitudes and intention of an individual to use Frog VLE application. The correlation between the benefits of a technology system and its usability with the behaviour, purpose or necessity, and the actual use of the user on such a system affects the acceptance of a technology (Lin, 2013).

Overall, from the Pearson Correlation result (Table 2), it can be seen that, there is a significant correlation either with moderate correlation or strong correlation between the four constructs of advantages, compatibility, complexity and observation with the Perceived of Usefulness and the Perceived of Ease-of-Use of Frog VLE. Roger's Diffusion of

Innovation Theory can help in understanding how individuals form the attitudes and technologies used in the context of virtual learning (Lee, et al., 2003). The moderate and strong Pearson correlation meant that 85% of respondents in the study school had begun using the Frog VLE application during the teaching and learning process in doing assignments given by teachers, as shown in Table 3.

According to Norini (2013), the assignment component allows teachers to assign, review, comment, and send assignments to students. This is proven by 61.67% of skilful students who used Frog VLE application for 1 to 3 months, as shown in Table 2.

**Table 2.** Frog VLE using experience based on students' stream

| <b>Frog VLE used Experience</b> | <b>Students' stream</b> | <b>Frequency ( f )</b> | <b>Total</b> | <b>Percentage ( % )</b> | <b>Total</b> |
|---------------------------------|-------------------------|------------------------|--------------|-------------------------|--------------|
| 1 - 3 Months                    | Science                 | 14                     | 37           | 23.35                   | 61.67        |
|                                 | Arts                    | 23                     |              | 38.35                   |              |
| 4 - 6 Months                    | Science                 | 9                      | 11           | 15.00                   | 18.33        |
|                                 | Arts                    | 2                      |              | 3.33                    |              |
| More than 6 Months              | Science                 | 7                      | 12           | 11.67                   | 20.00        |
|                                 | Arts                    | 5                      |              | 8.33                    |              |
| <b>Total</b>                    |                         | <b>60</b>              |              | <b>100.00</b>           |              |

**Discussion**

Findings showed that Frog VLE has been used by students and teachers in academic activities because items that achieve moderate and high mean average range are all in academic activities such as studying outside the classroom (Item 3 of Advantages Construct), get material for learning (Item 4 advantages construct), doing the assignment (Item 2 of Compatibility Constructs), get information (Item 4 of Compatibility Constructs) and share information (Item 2 of Observation Construct). Therefore, apart from Roger's DOI theory, there are also external factors that affect respondents in using Frog VLE. Factors such as academic factors, social influencing factors and habit factors also affect the use of Frog VLE application (Ibrahim, 2016).

Furthermore, the results of the research showed that there were moderate and strong correlation between the four constructs of advantages, compatibility, complexity and observation with the Perceived of Usefulness and the Perceived of Ease-of-Use of Frog VLE application. It also predicts that this situation will increase the use of more components of Frog VLE in the nearer future, if action is taken and besides we can spread the knowledge of using Frog VLE applications, utilizing Frog VLE components will be taken more actively and energetically. In summary, the results from the study conclude that TAM is a very accurate model to be used in predicting the acceptance of technology among teachers and students in Malaysia (Luan & Teo, 2009).

Finally, this finding is consistent with previous studies of Roger's DOI theory and TAM model that emphasizes the use of technology influenced by the constructs of the advantages, compatibility, complexity, ease-of-use and usefulness of the technology. The responsible parties and the government to offer a good, conducive and advanced technology especially in education in this technology and globalization era, should always improve implementing the Frog VLE application to school. Consistency with the government's vision of Frog VLE's main vision of the project is to provide new education and innovation in Malaysia and to bridge the digital divide between urban and rural students (Frog Asia, 2012). This is because previous studies also showed that students' academic achievement improves with blended learning methods such as in the classroom and virtually was more than what is expected (Deperlioglu & Kose, 2013).

Accordingly, the findings of the Advantages, Compatibility, Complexity and observation Correlation with the Perceived of Usefulness and the Perceived of Ease-of-Use is shown in Table 3.

**Table 3.** DOI Construct Correlation with the Perceived of Usefulness and the Perceived of Ease-of-Use

| <b>Construct</b> |                     | <b>Perceived of Usefulness</b> | <b>Perceived of Ease of Use</b> |
|------------------|---------------------|--------------------------------|---------------------------------|
| Advantages       | Pearson Correlation | .645**                         | .632**                          |
|                  | Sig. (2-tailed)     | .000                           | .000                            |
|                  | N                   | 60                             | 60                              |
| Compatibility    | Pearson Correlation | .562**                         | .605**                          |
|                  | Sig. (2-tailed)     | .000                           | .000                            |
|                  | N                   | 60                             | 60                              |
| Complexity       | Pearson Correlation | .667**                         | .795**                          |
|                  | Sig. (2-tailed)     | .000                           | .000                            |
|                  | N                   | 60                             | 60                              |
| Complexity       | Pearson Correlation | .670**                         | .862**                          |
|                  | Sig. (2-tailed)     | .000                           | .000                            |
|                  | N                   | 60                             | 60                              |

The correlation between the constructs of advantages, compatibility, complexity and observation with the Perceived of Usefulness and the Perceived of Ease-of-Use of the Frog VLE application was in the value level of (r) 0.51-0.70 except the correlation mean of the observation constructs with the Perceived of Usefulness and the Perceived of Ease of Use of Frog VLE applications where the value (r) 0.862 \*\* is located at a strong correlation range of 0.71-0.90. Finally, the distribution of respondents based on component of Frog VLE application that has been used is shown in Table 4.

**Table 4:** Distribution of respondents based on component of Frog VLE application that has been used

| <b>Component of Frog VLE application</b> | <b>Distribution of Respondents Based on Students' Stream</b> | <b>Frequency (f)</b> | <b>Total</b> | <b>Percentage (%)</b> | <b>Total</b> |
|--|--|----------------------|--------------|-----------------------|--------------|
| Assignments                              | Science  | 30                   | 51           | 50.00                 | 85           |
|  | Arts   | 21                   |              | 35.00                 |              |
| The Voice                                | Science  | 3                    | 10           | 5.0                   | 16.7         |
|  | Arts   | 7                    |              | 11.7                  |              |
| Forum                                    | Science  | 6                    | 7            | 10.00                 | 11.7         |
|  | Arts   | 1                    |              | 1.7                   |              |
| The Pond                                 | Science  | 2                    | 3            | 3.4                   | 5.0          |
|  | Arts   | 1                    |              | 1.7                   |              |
| Frog Store                               | Science  | 2                    | 9            | 3.4                   | 15.0         |
|  | Arts   | 7                    |              | 11.7                  |              |
| Frog Community / Pools                   | Science  | 3                    | 10           | 5.0                   | 16.7         |
|  | Arts   | 7                    |              | 11.7                  |              |
| Resource Manager                         | Science  | 1                    | 2            | 1.7                   | 3.4          |
|  | Arts   | 1                    |              | 1.7                   |              |
| Others                                   | Science  | 0                    | 2            | 0.00                  | 3.4          |
|  | Arts   | 2                    |              | 3.4                   |              |

## Conclusion

Overall, these four constructs have significant correlation with perception of ease-of-use and perception of usefulness of Frog VLE application. The study proved that perceptions of usefulness and perceptions of ease of use are seen as important factors affecting attitudes towards using technology. Thus, Frog VLE application would be used more widely if it is designed to be more user friendly for the teachers and students. It is because finding shows that there are only 50% of the respondents who consider Frog VLE application is convenient. It is supported by TAM Model which proved that individual's perception towards new ideas or innovations will influence the attitude and intention of using technology and the Rogers' Diffusion of Innovation Theory (DOI) which is one of the latest technology acceptance theory used by the researcher to explain the meaning of how the new ideas and technologies are spread through a social culture.

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