A MODEL FOR ASSESSING THE IMPACT OF SYSTEM QUALITY AND SATISFACTION ON CONTINUING TO USE E-LEARNING SYSTEM.

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ABSTRACT: *E-learning is a future educational channel that will be a substitute for the traditional learning system, because it has the ability to overcome the spatial and temporal limitations faced by the traditional learning system. E-learning has recorded rapid growth in recent years due to its importance and impact in the private and public sectors. However, the success of the e-learning field has to depend on certain characteristics that without doubt will improve the prospects of flourishing in this area. Importantly, this research focuses on system quality, because this plays a crucial role to satisfy users in general. Quality is a determining factor for the success of any e-learning project and the real success is based on sustained usage. If the quality of the e-learning system is poor, this will discourage users from adopting or using the system. In some cases the users reject the system after using it for a trial period, and this experience discourages the user from continuing to use the system. Basically, there are several characteristics and functionalities that can have an impact on user satisfaction as they use the e-learning system. These characteristics and functions contribute particularly to the quality of the e-learning system and in general the quality of the whole system, because these characteristics are related to the system quality and user perspective. The characteristics which should be taken into consideration include usability, reliability and efficiency, which were chosen from common models that included these aspects. Moreover, these characteristics include sub-characteristics as follows: usability (learnability, understandability, operability, attractiveness, and navigation), reliability (fault tolerance, maturity, recoverability, and consistency) and efficiency (time behaviour, resource utilization) which are considered as real challenges.*

Keywords: E-learning systems, system quality factors, usability, reliability, efficiency, satisfaction, continue to use.

1.0 INTRODUCTION

Recently, the quality of e-learning systems is one of the important topics in education. Quality is considered a crucial issue for education in general, and for e-learning in particular [1]. The e-learning system is becoming necessary in teaching, especially to access teaching materials for long-distance learning. A huge number of existing e-learning systems still face the problem of satisfying the quality required by stakeholders [2]. Improving and assuring quality is critical to the success of any educational organization involved in the use of e-learning systems [3].

There are many software quality models that draw the foundation for developing an appropriate model for e-learning. A quality model is defined as set of attributes and the correlated relationship between them, which provide the basis for specifying the quality requirements and evaluating the product quality [4]. These reachable quality models are defined as twenty-eight models include, but are not limited to McCall, Boehm, FURPS, Dromey, QMOOD, ISO 9216 and etc.

The investigation of these quality models includes the comparison of the available quality attributes which are considered as attributes for system quality. Thirty-five common attributes have been found in twenty-eight quality models. The common attributes that found in the majority of these models are identified as usability where the frequency was 27, reliability was 25, and efficiency was 23 Straight. These attributes were mainly categorized for the system quality from the prospective of the end user, which they play a very important role in building user satisfaction to continue using the e-learning system.

2.0 PROPOSED FRAMEWORK

Based on the comparison, five characteristics, usability, reliability, efficiency, maintainability, and portability are found to be the most common in those models, indicating that they are important characteristics. These characteristics must be within the developer requirements in the design of any system. As the study goal is targeted on characteristics in terms of the end-users as learners, the focus was put on the relevant characteristics of the end users only. Because of that, maintainability is ruled out as it deals specifically with the business owner and project manager, and portability which is within the jurisdiction of a project manager. Thereby, this study only looks further onto the top three characteristics which are usability, reliability, and efficiency with their sub attributes which have been mentioned previously.

2.1 System Quality

System quality plays an important role in the success of an overall software system. It is considered as a very important aspect for developers, users, and project managers. System quality is the extent to which an industry define a set of desirable features that should be incorporated into the product in order to enhance its lifetime performance [5]. Moreover, according to the Information System Model, system quality is a critical success attributes which influences on user satisfaction and intention to use[6].

2.1.1 Usability

Usability is one of the most important attributes for all software quality models. It is one of the crucial attributes in the development of successful collaborative software applications [7]. Usability plays a significant role towards the success of e-learning applications [8].

2.1.2 Reliability

Reliability is considered as one of the most important attributes of software quality [9].The reliability is a set of attributes that relate to the capability of the software to maintain its level of performance under stated conditions for a stated period of time. The system also must have the ability to reestablish its level of performance and continue to produce the same results [10].

2.1.3 Efficiency

Efficiency is one of the attributes that was accounted very important attributes of software quality. Efficiency is the capability of the software product to provide appropriate performance, relative to the amount of resources used under stated conditions [Papanikolaou, K ,2008[10].

2.2 Satisfaction

User satisfaction is the measurement of the successful collaboration among an information system and its learners. It is the range to which learners believe the information system meets their desires. If a system meets the requirements of the users, their satisfaction with the information system will be improved. On the other hand, if the system does not provide essential information, they will become dissatisfied [11]. There are many studies that have found a positive relationship between system quality with user's satisfaction in e-learning systems.

2.3 Continue to use

Continue to use is an indicator used to capture the factors that influence a favorite behavior[12]. The successful of any e-learning system depends on two things, the acceptance of satisfaction and continue to use. Therefore, it was necessary to find out the relevant factors that predict student's continued use of e-learning [13]. Moreover, the intention to use is an essential attributes that defines whether users will really utilize the system or will not really utilizing the system [14]. There are many studies that have found a positive relationship between user's satisfaction with continued usage intention of e-learning systems.

3.0 Survey Analysis

The demographics of the respondents are the majority of the 236 respondents (57.8 %) were female while 172 respondents (42.2%) were male. As for the age of the participants, more than three-quarters of the 334 respondents were from 24 years or younger (81.9%) while 60 respondents (14.7%) were 25 years to 34 years, and 14 respondents (3.4%) were from 35 years to 54 years. As for the education level of the participants, more than half of the 274 respondents (60.5%) had bachelor degrees 87 respondents (21.3%) were diploma holders while 41 respondents (10.0%) were Master's degree holders, and 33 respondents (8.1%) were Ph.D. degree holders. As for experience with technology, 245 respondents (60%) had above 3 years, 103 respondents (25.2 %) had from 1-3 years, while 60 respondents (14.7%) had less than 1 year.

3.1 Data Analysis

In the process of collected data analysis, the structural equation model (SEM) procedure was followed, which was suggested by Anderson and Garbing [15]. This model consists of two major parts that are measurement and structure model. Where was using the measurement model to examine the reliability and discriminant validity which detailed it in table 2, where were all latent variables in the survey had high construct reliability. The composite reliability of this study ranging between 0.8038 and 0.9345. While, the items loading for the 54 items ranged from .0708 (OQ2) to 0.936 (CQ2). All of the items surpassed the .7 guideline. A common measure to establish convergent validity on the construct level is the average variance extracted (AVE). The measurement model's convergent validity is assessed by examining its average variance extracted (AVE) value, which should be higher than (0.5). All constructs have AVE value acceptable which was ranging from 0.5783 to 0.8263.

The sub-attributes of usability can explain around 51.01% of the variance in usability, moreover, sub-attributes of reliability can explain around 38.40% of the variance in reliability, while, sub-attributes of efficiency can explain around 61.10% of the variance in efficiency. Therefore, the usability, efficiency, and reliability can explain around 43.10% of the variance in system quality, while system quality can explain about 57.70 % of variance in satisfaction, and the last value of satisfaction can explain about 55.34% of the variance in continue to use the explained all the variances are high a bit of medium.

Where, all of the values greater than 0.33 and less than 0.67. The attributes of system quality are usability, reliability and efficiency, which has an impact on system quality as follow; usability small effect at 0.05, reliability medium effect at 0.16, and efficiency small effect at 0.04. The main objective of this analysis is the demonstration of the three additional dimensions as a complete measurement model. The result of hypothesizes testing showed significant support for twelve of hypothesis in this study, and four of hypothesis are not significant.

4.0 DISCUSSION AND CONCLUSION

The purpose of this study was to test the top three attributes of system quality with their sub-attributes in public university in Malaysia. The study also examined the relationships between the system quality and user satisfaction, and the impact of user satisfaction on usage continuance. The model adopted in this study explain that sub-attributes of usability can explain around 51.01% of the variance in usability, moreover, sub-attributes of reliability can explain around 38.40% of the variance in reliability, while, sub-attributes of efficiency can explain around 61.10% of the variance in efficiency, Therefore. the usability, efficiency, and reliability were positively related to system quality explaining the around 43.22% of the variance in system quality , while system quality was positively related to satisfaction explaining about 57.70 % of variance in satisfaction , and the last value of satisfaction was positively related to continuing to use explaining about 55.34% of the variance in intention to use.

In conclusion, this study involved the system quality factors, specifically within the end-users' factors, which found that usability, reliability, and efficiency affected the system quality. Moreover, system quality is a significant attribute influencing user satisfaction in using an e-learning system. User satisfaction was also found to be significant in affecting users' intention to use. The obtained results of this study will assist developers to develop e-learning systems by adopting these factors which finally affect the user satisfaction in the aspect of continue to use.

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