Post Review of E-Education System Performance
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Abstract: - An institution which provides e-education system is central to its ability to gain competitive advantage. High performance of e-education system will increase the organizational value in general and to ensure that, performance review is essential. The purpose of this study is to review the performance e-education system in Malaysia by using an appropriate framework as a basis. The objectives are inclusive of measuring the success and effectiveness of the implemented e-education system. Quantitative and qualitative method is use in this study to assess the implemented e-education system. This study had shown the implementation performance of e-education system with 75% rate of success and effectiveness. It is also concluded that the positive result gained from the survey is supporting the IS continuance which is very important variable in evaluating the e-education system.

Key-Words: - Perceived organizational benefits, expected confirmation, system effectiveness, system evaluation, IS continuance, perceived usefulness.

1 Introduction
E-education is an online or electronic education through Internet connection and getting popular in higher institution and organizations. It was proposed by Flowers [1] that e-education is a need in technology education since this online education can overcome some traditional barriers related to time, cost and place. To the organizations and institutions of higher learning, they can utilize e-education strategies to facilitate processes of developing a knowledge worker or students while embarking on globalization.

There are lots of money, time and effort invested in order to implement the e-education system. Significant investment has been made in order to implement the e-education system [2]. One of the goals of these expenditures was improved productivity in the institutions and increases the achievement of students and generally the achievement of the institutions. However, little works has been done determining whether these expenditures on the e-education system implementation is success or not and has it led to the performance improvement or in other word, either is it effective or not [3].

The post- review on performance of e-education system or any large system is a must activity to be carried as there was no consistent trend showing positive returns [4] from spending in information technology system or in the case e-education system to the productivity or the effectiveness of the system. The main reason why the review should be in place is to identify either the implemented system is actually meeting up the goals and objective of the proposed system. Hence, the purpose of this paper is primarily to present the post-review of e-education system performance in Malaysia by using an appropriate framework as a basis.

2 Post Review of E-Education System Performance
The e-education has virtually unlimited potential to expand educational horizons [5] and empower people to take practically as much as they want and need, put everyone in charge of their own learning and growth [6]. With help from ICT, the e-education also become tools and enablers to make learning more interesting, stimulating, motivating and meaningful to students [7]. Using electronic resources is no longer a new way of accessing information. It was a change in education that demands a new approach to some aspects of students learning [8]. E-education system refers to information system that supports online education that uses electronic delivery of education services which rely on Internet and its related technologies [9]. E-education courses are delivered through web interface and this allows peoples in remote location able to learn variety of courses. It is
important in line with making the higher education possible for more people in current rapid economical and societal changes [10-11]. However, some effort is required at the beginning of the program to make the new students and instructor familiar with the online tools and aware of the features [12].

Regarding the post performance review, Rosenberg [13] writes that evaluation of e-education is ensuring that business can have a high quality learning program that is not taking too long to deploy, available at the right time and delivered at an optimum cost. Other than that, Jolliffe et. al [14] highlight that evaluation of e-education should includes learners’ belief to overall effectiveness of the learning event or the learning material being used. With relates to this also, it is a need for the system to be reviewed thoroughly. Also emphasized by Saadiah et. al [15] that the study of e-education system based on educational technology is not reflecting the realities in the implementation of e-education system today. In addition, Illera and Escofet [16] highlight that the evaluation based on overall development of the e-education project from the initial goal that were set has been undertaken over the last few years. In addition, the effectiveness of the implemented system is not being intensively analyzed and this could lead the reduction of user’s interest and also increase the possibility for system failure in a long term.

The aims of the study are to review and measure the performance and success rate of e-education system post implementation. Review or evaluation is important in every system implementation and in this context, for the survival of e-education system. E-education performance is crucial to be reviewed and planned properly as the review will enable the implementer to answer the organization questions and to validate whether the objectives of the implementation are met.

In reviewing the system post implementation, there are several approaches to measure the performance. It is important to recognize the review goal and the criteria to review. For this study, two important criteria are selected, the success and the effectiveness. Success measurement looks at the system performance and acceptance while Information System success is a measure of degree to which the person reviewing the system believe that the stakeholders is better off [17]. On the other hand, the effectiveness of the system requires judgment at how well the system is performing relative to its objective and the defined criteria. Referring to McGraw-Hill Dictionary of Scientific & Technical Terms [18], effectiveness is measure of the extent to which a system may be expected to achieve a set of specific mission requirements expressed as a function of availability, dependability, and capability. Performance management is a continuous cycle, and performance evaluation is the end points, as well as the beginning because the system’s performance is the source for planning future system improvement.

3 Research Model

The research model in Fig. 1 was adopted from [15]. The model has four main variables which are e-education system success model which comprise of Perceived Organizational Benefit, Perceived Usefulness, Expected Confirmation and Organizational IS Continuance.

![Fig 1 E-Education System Success Model](image)

Explained by [9], ‘perceived organizational benefits’ refer to either the anticipated or achieved advantages that the technology can or has provided the organization. Then, ‘perceived usefulness’ refers to the degree to which a person believes that using a system would enhance his or her performance. The third variable, ‘expected confirmation’ refers to the evaluation process, which is a cognitive exercise made up of a
combination of the experience of interacting with a technology and the resulting satisfaction or dissatisfaction associated with usage of the technology or the consumption of the product (information) of the technology. The final variable, ‘organizational IS continuance’ refers to stakeholders’ perceptions of the extent of organizational commitment or organizational decision towards continuing use of the system; and extent of its institutionalization in the organization.

4 Methodology
In order to achieve a valid and reliable result, the study method requires set of procedures or methodology adoption. The chosen method for this study is the quantitative and qualitative method which comprises of questionnaire survey and interview. The interview is conducted to gather in depth information to support and find justification of the given answers in the questionnaire.

A developed and tested questionnaire by [9] was chosen as a survey instrument. As the study is focusing on the online education system, the questionnaires also conducted through the same medium. For this, the web-based online tool has been developed and published in the web. All the target respondents were emailed out the link to the survey website. However, some respondents were self administered and informal interviews were conducted. The respondents are indentified through business contacts and searching through a web site of the institutions whom having the e-education or e-learning system implemented. It is well understood that the e-education system between organizations is not exactly the same. However to facilitate for this study, the assumption being made that the system is involved all the stakeholders in the organizations. Therefore, the sampling is selected randomly from more than 25 identified organizations and the responds received within the given time then used in the data analysis.

5 Results and Discussions
This section discussed the result from the post review performance survey of e-education system based on the completed online questionnaire. Data analysis for the discussion was generated using Rasch Measurement Model that allow in measuring the success rate and the effectiveness of the implemented system.

5.1 Respondent’s Profile
The respondents’ profile gathered is more on the demographic background of the respondents. The information’s are inclusive of role in the e-education system, type of organization and how long the organization has implemented the e-education system.

<table>
<thead>
<tr>
<th>No</th>
<th>Category</th>
<th>Criteria</th>
<th>#Respondent</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organization type</td>
<td>Government agency</td>
<td>3</td>
<td>50</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quasi-government agency</td>
<td>3</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higher Learning Institution</td>
<td>33</td>
<td></td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private Organization</td>
<td>11</td>
<td></td>
<td>22%</td>
</tr>
<tr>
<td>2</td>
<td>Length of implementation</td>
<td>More than 1 year, Less than 3 years</td>
<td>6</td>
<td>50</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More than 3 years</td>
<td>44</td>
<td></td>
<td>88%</td>
</tr>
<tr>
<td>3</td>
<td>Role in the e-education system</td>
<td>Lecturer/ Instructor</td>
<td>27</td>
<td>50</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administrator</td>
<td>11</td>
<td></td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Others</td>
<td>12</td>
<td></td>
<td>24%</td>
</tr>
</tbody>
</table>

Table 1  Respondent’s profile

Total number of respondents is 50 out of 500 mails sent. Respondents were contacted through email and phone calls and all are responded through an online survey form. There are 19 entities inclusive of higher
learning institutions and other organizations participated in the survey. Summary of the respondents are depicted in Table 1.

Higher Learning Institution is the higher contributor (34%) compared to other institution/organization (34%). This shows that most of the organizations that implement the e-education system are the higher learning institution and their population in the e-education system is much more compared to other organization. Another factor that might contribute to this is because there is more willingness from Higher Learning Institution as a part of education body to participate in the survey compared to other organizations that is more on service and profit oriented. Most of the e-education system has been implemented more than 3 years (88%) while only 12% is implemented more than 1 year but less than 3 years. This indicates that there is a maturity level of the system when they were mostly in place and in use for more than 3 years. Other than that, more than half of the respondents are from lecturer (54%) and the remaining are 22% administrator and others is 12% inclusive of users, program coordinator and management team.

3.2 Data Analysis & Discussion
The response data were analyze using Rasch Measurement Model and are presented in table 2 and Fig. 2. Table 2 shows the summary of the survey for the post review for e-education system, measured by the person and items or the questionnaire. The first item to look at is the reliability measurement, represented by Cronbach Alpha value. Reliability refers to the degree of consistency with which instances are assigned to the same questionnaire by different respondents or observer [19]. In this result summary, the Cronbach Alpha value is equal to 0.97 and the person reliability equal to 0.95 shows that the respondents involved in the survey is very reliable and the survey is acceptable. In Rasch model, the value ranges from 0.60 to 1.40 is set as accepted value [20]. The reliability of the data is very important and become a pre-requisite before any further analysis and conclusion to be made or else the interpretation will be inaccurate and so do the conclusion.

Table 2 also shows the value of reliability, mean and others where the result was found to be statistically significant at the $p=0.01$. The $\text{Mean}_{\text{person}}$ is 1.10 logit where this positive means show that the survey result is positive towards the objective. The Item reliability is 0.87 which is also very high and valid to measure the success and the effectiveness of the system. $\text{Mean}_{\text{item}}$ is set at 0.00 logit, as zero value to start the scale of measurement for the e-education system success and effectiveness. Hence, the Rasch probability formula will be used to calculate the percentage, either it meets the benchmark of good implementation or not. With regards to the international quality standard, the benchmark for good implementation or good practice is set at 2 σ (sigma) or equivalent to 75% of positive agreement. The calculation of probability is as follow:

$$\text{Probability of agree } P(\theta) = \frac{\exp(1.10\theta)}{1 + \exp(1.10\theta)} = 0.75$$

The probability of agree shows that the post implementation performance of e-education system is high (75%). This measurement led to the success and effective result of the e-education system implementation which meet the two sigma (2σ) level. It has been standard and recognized worldwide that 2σ is benchmark of a good practice or good performance.

Fig. 2 shows the item map of item where each of the questions is represented by a keyword to ease of identification and reference in analysis. There are 45 questions which consists of 24 questions from category Perceived Organizational Benefits, 4 questions from category Perceived Usefulness, 4 questions for category Expected Confirmation and balance 13 questions are related to Organizational IS Continuance category. For the first category, all the keyword of the items started with ‘OB’. Similar to that, Perceived Usefulness category start with ‘PU’ keyword, Expected Confirmation start with ‘EC’ keyword and Organizational IS Continuance start is ‘IS’.

The item map in Fig. 2 shows that out of 45 items, 35% are located above $\text{Mean}_{\text{item}}$, 33% is still within the standard deviation value and while the remaining 2% is outside the standard deviation. The standard deviation of the measurement ruler is 1.12 logit from the $\text{Mean}_{\text{person}}$ value that is 1.10 logit as per shown in table 2. There is one item that is holding the 2% and is item is the question that asking if the respondent would like to
discontinue using the e-education system. This means that most of the respondents are willing to continue using the system; ideally to support that e-education system is effective and successfully implemented.

The result from the analysis is important to report of success or post implementation performance results to a variety of audiences, from stakeholders to local and state departments of education and the community at large. Based on the feedback asking the respondents about their opinion, factors that contribute to improvement to e-education system post implementation performance are like support from senior management, commitment from faculty staff to use the system, user friendly system and comprehensive contents is a must. Other than that, support staff with credibility of the software development and problem solving is also essential.

![Table 2 Summary of Collected Data](image)

![Fig. 2 Item Map](image)

**6 Conclusion**
E-education system has become popular and implemented in almost all higher institutions and many organizations. However, with lack of measurable outcomes after the implementation, organization will not know how success the project has been delivered that meeting to their objectives. This study has reviewed 50 respondents from 19 institutions and organizations and found the positive feedback on the implemented e-education system especially in higher learning institution. The analysis showed that the implementation of e-
education system is successful and effective. This is proven by the statistical analysis which the percentage of success and effectiveness is 75% with high reliability of person and item. With the finding, it is confirmed that the performance of post implementation on e-education system in Malaysia is good, success and effective. At the same, the e-education system also confirmed to be effective and support for the continuance use of the Information System. With regards to the concern that level of acceptance or post review performance might vary for different organization, further study is warranted to confirm these findings specifically by the institutions or organizations. With the extensive review of post implementation performance of e-education, the e-education will survive better in a long term and continue to contribute the benefits to the organizations and community.

References: