E-learning implementation using user experience questionnaire

Pandu, Ahmad Nurul Fajar
Information Systems Management Department, BINUS Graduate Program-Master of Information Systems Management, Bina Nusantara University Jakarta, Indonesia

E-mail: pandu.r@binus.edu, afajar@binus.edu

Abstract: Online learning system or commonly called e-Learning which is commonly applied to the world of education, is now increasingly used in companies with diverse business fields. The concept of e-Learning is a transformation of conventional learning into digital form. The concept of e-Learning is now widely known and can be accepted in the community as evidenced by the many applications in the world of education and business. The aim to be achieved in this study is to implement e-Learning to PT MRK Diagnostics and find out whether or not there are inhibiting factors in implementing e-Learning to PT MRK Diagnostics. The method used to obtain recommendations after using e-Learning uses the User Experience Questionnaire (UEQ) method to find out the impression of using e-Learning that affects employee performance. Edmodo e-Learning has positive impression values in the Attractiveness (1,950), Perspicuity (2,100), Efficiency (1,775), Dependability (1,575), Stimulation (1,125), and Novelty (0.875) groups.

1. Introduction
Medical equipment is one of the important components in addition to health experts and medicines in health support facilities. Medical device technology is growing rapidly as the development of IT technology both from simple technology to high technology is used in health care facilities, personal health services, as well as in households. The increasing need for medical equipment in Indonesia itself has not been matched by the development of domestic medical devices. The ease of entering and entering the era of globalization is now one of the causes of the health equipment market in Indonesia is dominated by medical equipment products abroad. E-Learning is a new way of delivering material both teaching and learning and knowledge sharing that uses internet electronic media as a learning system [1]. E-Learning has a very broad understanding that makes some experts try to describe their opinions. There are 4 e-Learning activity models, namely individualized self-paced e-Learning offline, individualized self-paced e-Learning online, group based e-Learning synchronously, and the last group based e-Learning asynchronously[2].

Employee / employee performance in general is a work manifestation carried out by employees which is usually used as a reference for evaluating employees within an organization or company. Good employee performance is a step towards achieving the goals of an organization or company so that it is necessary to strive to improve the performance of these employees [3]. To be able to find out the high and low performance of a person, then a performance measurement is needed. Performance measurement is a tool to improve the quality of decision making and accountability [3].
2. Literature Review

There are several methods in performance appraisal, namely the assessment of past and future oriented methods [4]. In a framework proposed by [there are four pillars in the knowledge management architecture. User Experience Questionnaire (UEQ) is a method that has been used to measure FRAT-up which is a measuring tool to measure the likelihood of a person falling and also used SCHELE which is an e-learning provided by the Faculty of Computer Science at the University of Indonesia [3]. This method uses a questionnaire to gather feedback from e-Learning users, with questionnaire items that can make respondents think for a long time to fill out questionnaires, but this method cannot be used for a study with in-depth material. [3].UEQ enables a rapid assessment of interactive user experience.

The questionnaire scale is designed to handle the impression of a comprehensive user experience. Questionnaire format that supports user responses to immediately express feelings, impressions, and attitudes that arise when using a product [5]. Attitudes toward measuring user experience are more positive than those identified in interviews and there are nuanced views on the measurement details [6]. UEQ contains 6 scales of a total of 26 items, including the following [6] :

1. Attractiveness, General impression of users on products, likes or dislikes. Size items include : annoying / enjoyable, good / bad, unlikable / pleasing, unpleasant / pleasant, unattractive / attractive, unfriendly / friendly.
2. Efficiency, The possibility of using the product quickly and efficiently and an organized interface. Size items include : fast / slow, efficient / inefficient, practical / impractical, organized / cluttered.
3. Perspicuity, Ease of understanding product usage and getting used to it. Size items include : understandable / not understandable, easy to learn / difficult to learn, easy / complicated, clear / confusing.
4. Dependability, Feelings of users in interaction control, security and expectations. Size items include : predictable / unpredictable, supportive / obstructive, secure / not secure, meets expectation / does not meets expectation.
5. Stimulation, What is interesting and fun from the use of the product, the motivation of the user wants to use it more. Size items include : valuable / inferior, exiting / boring, interesting / not interesting, motivating / demotivating.
6. Novelty, Product design that is innovative and creative and attracts user attention. Size items include: creative / dull, inventive / conventional, usual leading edge, innovative / conservative.

3. Research Method

The factors examined consisted of twenty-six (26) items from six (6) scales contained in UEQ (Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty). In addition to using UEQ, using a Likert Scale to assess its effectiveness based on indicators of inhibiting factors namely Investment, Culture, Technology and Infrastructure and Material Design. The place to implement e-Learning is done at PT MRK Diagnostics, one of the PMA Private companies engaged in medical devices. The subjects of the research were PT MRK Diagnostics field employees in this case the technicians and health analysts of PT MRK Diagnostics.

The development of facilities that utilize IT at PT MRK Diagnostics continues to experience development with the proven application of e-Learning using Edmodo. Edmodo is a free e-Learning facility in online learning that can be accessed through http://www.edmodo.com/. In the application of e-Learning, a good and easy to understand interface is needed. Evaluations carried out on PT MRK Diagnostics field employees in this case are applications or commonly called health analysts. The interface in Edmodo should be as user friendly as possible, in addition to making it easier for the user to use, a good and good display certainly gives a good impression to users who use the e-Learning Edmodo.

There are several features in Edmodo to support learning / sharing on PT MRK Diagnostics. The features in Edmodo classify features based on the access of the instructor's and student's users, following the features embedded by Edmodo Examples of training at PT MRK Diagnostics, conducted direct learning / training with face to face and interspersed with light evaluation. For an evaluation of how far
to master the material, given an advanced task given online at Edmodo e-Learning. After the questionnaire was disseminated, respondents who took part in training in Jakarta were given a filling time of about 30 minutes after using e-Learning Edmodo where filling was done on the last day of training. Whereas for those located outside Jakarta, a maximum of 24 hours of time for the results can be returned to the author where the filling is done after the respondent tries to directly use Edmodo e-Learning. The following are the results of filling out the questionnaire with 10 respondents:

Figure 1. Response from all respondents

In figure 1 above shows the overall answers of 10 respondents with a total of 26 questions and a rating scale of 1 to 7. From the results above, then it will be converted per item where the value of +3 becomes the limit of the best value and the value of -3 becomes the worst value, the following values have been converted:

Figure 2. Convert values from respondent’s answers

Figure 3. Scale of each respondent
From the conversion values above in Figure 2, we will get the average values of each respondent, the average values obtained are Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty, and the conversion of the average value obtained Figure 3. Based on Figure 3 the results of each respondent obtained by using the conversion value where the value of +3 became the limit of the best value and the value of -3 being the worst value. At first glance, the results above show that there is no very negative assessment of the use of Edmodo e-Learning.

4. Result and Discussion

Based on the data of 10 answers from respondents that have been compiled, the calculation of mean, variant and standard deviation is carried out. Each of these questions is color coded according to the group, namely Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The results can be seen in the following Figure 4.

| Item | Mean | Variance | Std. Dev. | No. | Left | Right | Scale |
|------|------|----------|-----------|-----|------|-------|-------|
| 1    | 2.3  | 0.7      | 0.8       | 10  | annoying | enjoyable | Attractiveness |
| 2    | 2.5  | 0.3      | 0.5       | 10  | not understandable | understandable | Perspicuity |
| 3    | 1.3  | 1.1      | 1.0       | 10  | creative | dull | Novelty |
| 4    | 1.8  | 0.8      | 0.9       | 10  | easy to learn | difficult to learn | Perspicuity |
| 5    | 0.9  | 1.0      | 1.0       | 10  | valuable | inferior | Stimulation |
| 6    | 0.4  | 0.7      | 0.7       | 10  | being | existing | Stimulation |
| 7    | 1.3  | 1.2      | 1.0       | 10  | not interesting | interesting | Stimulation |
| 8    | 0.5  | 0.7      | 0.7       | 10  | unpredictable | predictable | Dependability |
| 9    | 0.2  | 0.5      | 0.5       | 10  | fast | slow | Efficiency |
| 10   | 0.6  | 0.8      | 0.8       | 10  | incentive | conventional | Novelty |
| 11   | 0.7  | 0.8      | 0.8       | 10  | obstructive | supportive | Dependability |
| 12   | 0.3  | 0.5      | 0.5       | 10  | good | bad | Attractiveness |
| 13   | 0.8  | 0.5      | 0.5       | 10  | complicated | easy | Perspicuity |
| 14   | 0.7  | 0.8      | 0.8       | 10  | unreliable | pleasing | Attractiveness |
| 15   | 0.5  | 0.5      | 0.5       | 10  | usual | leading edge | Novelty |
| 16   | 0.4  | 0.5      | 0.5       | 10  | unpleasant | pleasant | Attractiveness |
| 17   | 1.2  | 1.1      | 1.0       | 10  | secure | not secure | Dependability |
| 18   | 1.1  | 0.9      | 0.9       | 10  | motivating | demotivating | Stimulation |
| 19   | 0.4  | 0.6      | 0.6       | 10  | meets expectations | does not meet expectations | Dependability |
| 20   | 0.2  | 0.4      | 0.4       | 10  | inefficient | efficient | Efficiency |
| 21   | 2.5  | 1.0      | 1.0       | 10  | clear | confusing | Perspicuity |
| 22   | 0.7  | 0.8      | 0.8       | 10  | impractical | practical | Efficiency |
| 23   | 0.2  | 0.5      | 0.5       | 10  | organized | cluttered | Efficiency |
| 24   | 0.3  | 0.7      | 0.7       | 10  | attractive | unattractive | Attractiveness |
| 25   | 0.5  | 0.7      | 0.7       | 10  | friendly | unfriendly | Novelty |

Figure 4. Average, Variant, and Standard Deviation

Figure 5 Average of impressions
After the average, variant and standard deviation have been found, the value is then processed into a graphical form which shows the average value in each question in negative, zero and positive positions. After obtaining the value per item, the following is a display for the average of the above scale seen from the group (Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty) shown in Figure 5.

| UEQ Scales     | Value |
|----------------|-------|
| Attractiveness | 1.950 |
| Perspicuity   | 2.100 |
| Efficiency    | 1.775 |
| Dependability | 1.575 |
| Stimulation   | 1.125 |
| Novelty       | 0.875 |

**Figure 6.** Average of rating scale

In Figure 6 shows the average value of all questions on UEQ seen from the group (Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty). In Figure 7 shows a graph of the average value of the questions according to the group (Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty). The average value of impressions with a range of values of -0.8 and 0.8 is the normal evaluation value, >0.8 is a positive evaluation value, while the value < -0.8 is a negative evaluation value. So it can be concluded that Edmodo e-Learning has a positive impression value, seen based on figure 6 has values 0.8 in the Attractiveness (1,950) group, Perspicuity (2,100), Efficiency (1,775), Dependability (1,575), Stimulation (1,125), and Novelty (0.875).

**Figure 8.** Appraisal conclusion chart

In the graph above which is shown in Figure 8, it can be seen from each group the conclusion of the average value. The details of why Attractiveness is of excellent value, Perspicuity is of good value, and so on, can be seen in Figure 9.
5. Conclusion
Based on research that has been done both from the results of implementation, testing and observation can be concluded that: Average value of questions according to the group (Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty). The average value of impressions with a range of values of -0.8 and 0.8 is the normal evaluation value, >> 0.8 is a positive evaluation value, while the value < -0.8 is a negative evaluation value. So it can be concluded that Edmodo e-Learning has a positive impression value, seen based on the table of values above 0.8 in the Attractiveness (1.950) group, Perspicuity (2.100), Efficiency (1.775), Dependability (1.575), Stimulation (1.125), and Novelty (0.875). Based on the results of a good evaluation through a questionnaire with the UEQ method there are a few shortcomings such as internet access and supporting infrastructure for those who have work outside Jakarta. Whereas from the user interface side, all respondents did not have problems in accessing and understanding the content presented because the user interface on Edmodo was almost similar to Facebook's social media so it was easy to use and familiar. In addition, Edmodo e-Learning also supports various files so companies can provide various types of files as needed.

References
[1] Ryann K. Ellis. (2009). A Field Guide to Learning Management System.
[2] Laugwitz, B., Held, T., & Schrepp, M. (2008). Construction and Evaluation of a User Experience Questionnaire. HCI and Usability for Education and Work, 63–76. http://doi.org/10.1007/978-3-540-89350_9_6
[3] Santoso, H. B., Yugo, R., Isal, K., Basaruddin, T., Sadita, L., Depok, J., …Schrepp, M. (2014). Research-in-Progress: User Experience Evaluation of Student Centered e-Learning Environment for Computer Science Program, 52–55.
[4] Rivai, Veithzal. 2005. Manajemen Sumber Daya Manusia Untuk Perusahaan, Dari Teori Ke Praktek. PT. Rajagrafindo Persada: Jakarta.
[5] Nawaz, A., Helbostad, J. L., Chiari, L., Chesani, F., & Cattelani, L. (2015). User Experience (UX) of the Fall Risk Assessment Tool (FRAT-up). 2015 IEEE 28th International Symposium on Computer-Based Medical Systems, 1, 1–4. http://doi.org/10.1017/CBO9781107415324.004
[6] Effie Lai-Chong Law Paul van Schaik, Virpi Roto; Attitudes towards user experience (UX) measurement; International Journal Human Computer Studies 72 (2014) 526 541.