The Influence of E-learning Design with Ease of Use as a Factor of Increasing Student Achievement: A Literature Review

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Abstract. The use of e-learning in the teaching and learning process at university is believed to increase learning outcome. This enables students in remote area to have learning materials as qualified as that of their counterpart in developed countries. However, although the use of e-learning considerably increases, the application of the e-learning at school is somehow complicated. Besides the financial reasons, the design and student’s perception towards the device has been the problem for its effectiveness. This research is aimed at finding the factors influencing students’ perception toward e-learning by adopting TTF (Task Technology Fit). After analyzing the data with SEM (Structural Equation Modelling) it is found that the variable of easiness in using the e-learning has significant effect on e-learning design and students’ enthusiasm in using it with Z value 1,008 and social trust has the lowest effect i.e. Z value 0,127.

1. Introduction

The rapid development of information technology brings great impact to the pattern of relations between individuals, between communities, even between countries [1]. In Indonesia, internet service is already widely enjoyed by the public. Based on the results of a survey conducted by the Association of Internet Service Providers Indonesia (APJII) said that the growth of Internet usage of Indonesia continues to increase, especially compared with the results of APJII research on the same thing in 2012. In research on the profile of Indonesian internet users in 2012, APJII reported penetration of user’s internet in Indonesia is 24.23%. While the survey in 2014 shows the penetration of Indonesian internet users is 34.9%, in 2016 internet users have reached 132.7 million [2].
Fig. 1 Countries with The Largest Internet User in Asia [3]

From Fig 1. it can be seen that Indonesia is in the top three in the Asian zone in terms of the number of internet users and continues to grow rapidly every year. The results of research conducted Marketers with research institute Mark Plus Insight which was launched in November 2013 on Indonesian internet users said that Indonesia's Internet users in 2013 reached 74.57 million people. According to the Ministry of Communications and Informatics (Depkominfo) in 2014 said that Indonesian internet users have reached 82 million users [4].

Fig. 2 Indonesian Internet Users in 2013 [2]

Utilization of information technology has penetrated various fields, not least education field. Utilization of information technology (internet and information system) become very needed to improve efficiency and productivity for management of education management. Success in improving efficiency and productivity will also determine the viability of educational institutions. In other words, delaying the application of information systems within educational institutions means delaying education performance in the face of global competition [2][5]. The results of the APJII [2] survey show that the higher the level of education, the more often the intensity of internet usage. Internet users with recent high school, diploma, undergraduate and postgraduate education are the largest Internet users.
Increased use of the internet along with increased education, this is influenced by the need especially in obtaining information from online sources. While the background of the work sector of internet users today is at most 28.1% of the trade sector, 25.5% consultant services and 12.7% education [7]. It is clear that the education sector also badly needs good personal internet connectivity related to the high demand of internet users in improving the flow of information.

2. Literature Review

Implementation of information systems has been widely done in the field of education. A very important point to do to measure the role of information systems is to conduct an evaluation seen from the components of information systems. This is done to get a good performance in an information system development, it is done to support the success of technology. Research related to the evaluation of e-learning user acceptance has been done using HOT-FIT method [8][9] the research explains that the exact relationship between Human, Organization, and Technology has a strong, positive (positive) relationship to Net Benefit (the benefits or benefits of applying information systems).

HOT-FIT is one of the theoretical frameworks used to evaluate information systems in education. The three factors in the HOT-FIT method are related in the eight dimensions of relation on the success of e-learning information system, namely System Quality, Information Quality, Service Quality, System Use, User Satisfaction, Organizational Structure, Organizational Environment and Net Benefits. This evaluation method clarifies all the components contained in the information system itself, namely human (human) which assesses the system of information in terms of use (system use) associated with who uses, training, hope, and acceptance or reject the system. Second is an organization that assesses a system of organizational structure and organizational environment related to planning, management, system control, superiors support, and financing. And third is technology (technology) which assesses the quality of the system, the quality of information and quality of service.

The lack of implementation of information systems due to the development of existing information systems are not in accordance with the needs. This is due, because it is not known exactly how the role of information systems to the organization. Successful use of information systems in an organization itself can be seen from the aspect of user satisfaction. User satisfaction is derived from the ease of user information system (user friendly) perceived by the user. The aspect of user satisfaction can be measured through the evaluation of system acceptance by using several models such as Task Technology Fit (TTF), Unified Theory of Acceptance and Usage of Technology (UTAUT), Technology Acceptance Model (TAM) and so on. Evaluation of information system using TAM method has been done, one of them is done on e-learning of RSBI Jombang. The result with users agree on the implementation of e-learning information system is simple and user friendly, and useful to improve students' ability to absorb the lesson [10].
Technology Acceptance Model (TAM) is the theory of information systems that make models about how users receive and use technology. This method proposes that when users are offered to use a new system, a number of factors influence their decisions about how and when to use the system, especially in terms of usefulness (users believe using this system will relieve it of difficulty, in the sense that the system is easy to use). The weakness of the TAM method is to provide only very general information or results about the interest and behavior of system users in receiving information technology systems. User behavior is not controlled by behavioral controls that explain why a person has different interests and behaviors in the same situation. Generally, TAM models are less able to fully explain the causation of variables in the model.

Evaluation of information systems can also be done with the use of Technology Task Fit (TTF) method. Associated with TTF and user acceptance at online auctions, Chang examines employment in web-based auction processes, some referring to appropriate software for online auctions, customer perceptions, customer perceptions of the intentions of using tools, and customer acceptance levels [11]. The results show the attitude of online customer operators and consumers positively affect the attitude of the use of technology agents. Consumers hope that technology agents promote efficiency and ease of online customer interaction, while operators expect agents to set up personalized and marketing services to consumers. This TTF method uses two components that interact, namely the task to be done as well as the technology used to help carry out its duties. The weakness of the TTF method is that information technology will only be used if its functionality and benefits are available to support user activity. Without describing how behavior and social influences that support user activity.

Social effects that support user activity can be identified using the Unified Theory of Acceptance and Usage of Technology (UTAUT) method, as has been done by Rika to measure the successful implementation of Enterprise Resources Planning in CPI companies [12]. This study found that the variables affecting the success of ERP implementation are performance expectancy, effort expectancy, social influence, managerial intervention, and JDE team quality (JDE team quality). This UTAUT method aims to explain the intent of the user to use the information system as well as the behavior of subsequent use. This theory states that the four key factors (performance expectancy, effort expectancy, social influence, facilitating conditions) are the direct determination of the intentions of use and behavior [13]. In the UTAUT method there are four key moderators, namely gender, age, experience, voluntariness of use, performance expectancy, effort expectancy, social influence, and facilitating conditions related to intention behavior that eventually result in behavior use. Behavior use becomes the measurement of user acceptance of a system.

The incorporation of UTAUT and TTF models has been done to determine the factors influencing the acceptance as well as the use of Custom Relationship Management (CRM) system in Taiwan's distribution service industry [14]. In this study, the influence of Behavioral Intention from the use of CRM system influenced by three key factors, namely Performance Expectancy, Effort Expectancy, Social Expectancy, and Task Characteristics and Technology Characteristics from TTF to Task-Technology Fit have indirect effect on Behavioral Intention. Ultimately, the determination of user behavior on the CRM system (User Behavior) will be influenced by Behavioral Intention factors and Facilitating Conditions.
Research to test the previous integration of UTAUT and TTF has also been done by Dishaw [15] with student respondents from several marketing research classes, systems of analysis, programmers, and operations management. The research was done by using the model individually and merging the two models, the result of the combination of both models resulted in a more in-depth explanation in knowing the user's behavior to use information system.

The combined model of UTAUT and other TTFs was developed by Zhou [16] in his research on UTAUT and TTF integration to explain the adoption of mobile banking users. Merging these two methods was chosen for several reasons. First, research conducted on the adoption of mobile banking users has been focused on user perceptions of technology and rarely considering the effects of task conformance and technology. Second, the study found that the suitability of tasks and technology not only affects user adoption but also affects the expected performance. This shows the importance of considering task and technological equilibrium factors. Third, compared to individual TTFs and UTAUT models, the combined model explains a more varied user adoption behavior. This shows the merging of the two models.
This study uses the model, which used Zhou's model consisting of eight variables and developed with the addition of perceived usefulness constructs, perceived ease of use, computer self-efficacy, and intention of use developed by Juan Carlos Roca [17], because it is considered to have a positive influence on the level of user adoption. This combined model is chosen because this model can provide an explanation of the level of user acceptance of the technology from the user (user), social environment and technology. The model involves twelve variables consisting of task characteristics, technological characteristics, task technology fit, performance expectancy, effort expectancy, social influence, facilitating conditions, perceived usefulness, perceived ease of use, computer self-efficacy, intention of use (intention to use), as well as user adoption (user acceptance).
3. Hypotheses

The hypothesis in this study consists of several hypotheses, namely task characteristics, technological characteristics, expected performance, expected level of ease, social influence, existing facility conditions, user acceptance, and suitability of tasks and technology, perceived usefulness, user perception, computer skills and intentions to use. The hypothesis of this research is:

H1: task characteristics have a positive effect on task conformance and e-learning technology.
H2: characteristics of e-learning technology have a positive effect on the suitability of tasks and technology.
H3: suitability of tasks and e-learning technology has a positive effect on user acceptance.
H4: expected level of ease has a positive effect on user acceptance of e-learning.
H5: The expected performance of e-learning usage has a positive effect on user acceptance.
H6: expected level of ease has a positive effect on the expected performance of e-learning usage.
H7: social influences have a positive effect on the acceptance of e-learning users.
H8: existing facility conditions have a positive effect on user acceptance of e-learning.
H9: The characteristics of e-learning technology have a positive effect on the level of ease that users expect.
H10: suitability of tasks and technology has a positive effect on the performance that users expect.
H11: The perception of ease of use will have a positive effect on the perceived usefulness of e-learning.
H12: Perceived perceptions have a positive effect on behavioral intentions for using e-learning.
H13: Computer skills will have a positive effect on the ease of e-learning perception.
H14: User intent to use e-learning has a positive effect on user acceptance.

The data collected through the questionnaire will be analyzed. After all the data collected, the next stage of the researchers performs data analysis by calculating the percentage value of the descriptive data of respondents and perform some test results of data from the variables obtained. The analysis phase
is done by hypothesis testing using SEM technique. This study uses SmartPLS software for hypothesis testing. Individual reflexive sizes are said to be high if they correlate higher by 0.7 with the constructs (latent variables) you want to measure. However, for the initial stage of development of scale measuring the loading factor value of 0.5 to 0.6 is considered sufficient [3]. While the reliability test is used for scale measurement at different times, locations and populations. Construct reliability is measured by two criteria: Composite Reliability and Cronbach Alpha (Internal consistency reliability) of the indicator block that measures the construct. The construct is declared reliable if the value of Composite Reliability > 0.7 and Cronbach Alpha above 0.6 so it is still acceptable [1].

4. Result and Discussion
This research uses Structural Equation Modeling (SEM) based on variant that is with Partial Least Square (PLS). In the measurement model analysis (Outer Model) is done by using two tests, namely test validity and reliability test. Validity test consists of Convergent Validity and Discriminant Validity. While the reliability test is expressed in the calculation value of Composite reliability and Cronbach's Alpha. While the reliability test is done to know the consistency of the regularity of the measurement results of an instrument.

Table 1. Loading Factor

| No. | Code  | Loading Factor | Information |
|-----|-------|----------------|-------------|
| 1   | KTU1  | 0.916          | Valid       |
| 2   | KTU2  | 0.905          | Valid       |
| 3   | KTU3  | 0.937          | Valid       |
| 4   | KTE1  | 0.757          | Valid       |
| 5   | KTE2  | 0.831          | Valid       |
| 6   | KTE3  | 0.900          | Valid       |
| 7   | KTE4  | 0.847          | Valid       |
| 8   | KTT1  | 0.836          | Valid       |
| 9   | KTT2  | 0.907          | Valid       |
| 10  | KTT3  | 0.722          | Valid       |
| 11  | KDH1  | 0.898          | Valid       |
| 12  | KDH2  | 0.910          | Valid       |
| 13  | KDH3  | 0.952          | Valid       |
| 14  | KDH4  | 0.876          | Valid       |
| 15  | TKD1  | 0.897          | Valid       |
| 16  | TKD2  | 0.785          | Valid       |
| 17  | TKD3  | 0.848          | Valid       |
| 18  | PS1   | 0.824          | Valid       |
| 19  | PS2   | 0.932          | Valid       |
| 20  | KF1   | 0.908          | Valid       |
| 21  | KF2   | 0.938          | Valid       |
| 22  | KF3   | 0.860          | Valid       |
| 23  | PP1   | 0.946          | Valid       |
| 24  | PP2   | 0.966          | Valid       |
| 25  | PP3   | 0.928          | Valid       |
| 26  | PKP1  | 0.843          | Valid       |
| 27  | PKP2  | 0.826          | Valid       |
| 28  | PKP3  | 0.867          | Valid       |
| 29  | PKP4  | 0.865          | Valid       |
| 30  | PKP5  | 0.832          | Valid       |
| 31  | PKP6  | 0.849          | Valid       |
| 32  | KD1   | 0.867          | Valid       |
| 33  | KD2   | 0.918          | Valid       |
| 34  | KD3   | 0.880          | Valid       |
| 35  | KD4   | 0.897          | Valid       |
| 36  | KD5   | 0.766          | Valid       |
| 37  | KMK1  | 0.875          | Valid       |
| 38  | KMK2  | 0.914          | Valid       |
| 39  | KMK3  | 0.806          | Valid       |
Table 1 shows the loading factor measurements for convergence validity testing. The table shows that all loading factor values > 0.5. After doing the test the validity of the reliability test again. Reliability test is done to know consistency regularity measurement result of an instrument. The reliability test in PLS is done through two criteria: Composite Reliability and Cronbach's Alpha. A construct is considered reliable if the value of Composite Reliability > 0.7 and Cronbach's Alpha > 0.6.

Table 2. Composite Reliability and Cronbach's Alpha

| Construct | Value of Composite Reliability | Value of Cronbach's Alpha |
|-----------|-------------------------------|---------------------------|
| KTU       | 0.942                         | 0.909                     |
| KTE       | 0.902                         | 0.854                     |
| KTT       | 0.864                         | 0.760                     |
| KDH       | 0.950                         | 0.930                     |
| TKD       | 0.882                         | 0.798                     |
| PS        | 0.872                         | 0.720                     |
| KF        | 0.929                         | 0.886                     |
| PP        | 0.944                         | 0.920                     |
| PKP       | 0.938                         | 0.922                     |
| KD        | 0.938                         | 0.917                     |
| KMK       | 0.900                         | 0.834                     |
| NP        | 0.944                         | 0.920                     |

Based on the value of Composite Reliability and Cronbach's Alpha, it can be seen that all constructs of this research model have Composite Reliability value > 0.7 and Cronbach's Alpha > 0.6. This states that the entire construct in the study has good reliability. Hypothesis testing is done by using value (t-value) which compared with t-table value. Hypothesis is accepted if the value of t-table, and the hypothesis is declared rejected if the value of t value < value t table [18] with the significance of the path coefficient test.

Table 3. Hypothesis Testing Results

| Hypothesis | Path | t value | t table | Information |
|------------|------|---------|---------|-------------|
| H1         | KTU → KTT | 2.998   | 1.66    | Accepted    |
| H2         | KTE → KTT | 7.270   | 1.66    | Accepted    |
| H3         | KTT → PP  | 2.389   | 1.66    | Accepted    |
| H4         | TKD → PP  | 0.112   | 1.66    | Rejected    |
| H5         | KDH → PP  | 0.492   | 1.66    | Rejected    |
| H6         | TKD → KDH | 3.042   | 1.66    | Accepted    |
| H7         | PS → PP   | 2.236   | 1.66    | Accepted    |
| H8         | KF → PP   | 3.811   | 1.66    | Accepted    |
| H9         | KTE → TKD | 8.630   | 1.66    | Accepted    |
| H10        | KTT → KDH | 2.398   | 1.66    | Accepted    |
| H11        | PKP → KD  | 12.584  | 1.66    | Accepted    |
| H12        | KD → NP   | 13.043  | 1.66    | Accepted    |
| H13        | KMK → PKP | 7.066   | 1.66    | Accepted    |
| H14        | NP → PP   | 0.551   | 1.66    | Rejected    |

Table 3 shows that there are three t-value hypotheses below the value of t-table 1.96 i.e. expected level of ease, expected performance, and user intentions. Thus, user acceptance in e-learning is influenced by the suitability of tasks as well as technology, social influence as well as condition of existing facilities.

5. Conclusion
The level of ease that is expected in e-learning cannot be perceived by the user because it is based on the interface design of e-learning is still not user friendly so this is causing users to feel the difficulty. The expected performance has not met the expectations of users, because e-learning cannot help the learning service process. This is because the performance of e-learning has not been maximized so that respondents feel unsure that e-learning is performing well so that raises the fear there will be error on the system. The results of statistical data analysis on the acceptance of e-learning can be concluded that the implementation of e-learning has not been as expected and there are still difficulties. The success of applying e-learning is only influenced by three factors that is conformity factor of task and technology with t-value level 2,389, social influence factor with t-value value 2,236, facility condition with t-value 3,81

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