

The Implementation of Unified Theory of Acceptance and User of Technology (UTAUT) Model to Analyze the Acceptance of Lecturers in Using e-Learning

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Abstract—Indisputably rapid education development and technology advancement correspondingly require that all subjects in the education world, such as: higher education, position themselves properly. The progression of information technology advancement in higher education is supposed to contribute in better teaching, better learning activities, specifically in an integrated teaching-learning system, commonly known as e-learning. Although SHARE-IT, as a formal web-based e-learning developed by ITS as a support to academic student & lecturer interaction, has been adopted since 2006, many departments in ITS have not embraced it, even does not recognize it in their academic activities. Such a fact definitely signals that the level acceptance of SHARE-ITS by its users is truncated. The research was to identify factors affecting the acceptance of SHARE-ITS with UTAUT Model in the perspective of lecturers using the e-learning. The research model was evaluated by means of SmartPLS software.

Based on the results of the research, it found the factors affecting the level of acceptance of SHARE-ITS adoption by lecturer and addressed recommendations for better level of adoption. The research findings, among other things, showed: facilitating conditions positively affecting to the behavior of SHARE-ITS adoption among the lecturers and behavioral intention positively affecting to the behavior of SHARE-ITS adoption among the lecturers. Both factors proved to be important to consider as they affected the adoption behavior and behavioral intention of the lecturers to adopt SHARE-ITS.

Keywords—E-learning; behavioral intention, higher education; technology adoption; user acceptance; UTAUT.

I. INTRODUCTION

Indisputably rapid education development and technology advancement correspondingly require that all subjects in the education world, such as: higher education, position themselves properly. It is certainly related with better

academic quality improvement and serves as a strategy to strengthen competitive advantage in order to successfully compete with other higher education [1]. The implementation of information technology advancement high education can support better academic activities through integrated teaching-learning system commonly known as e-learning. E-learning is an approach adopted by Sepuluh Nopember Institute of Technology Surabaya (ITS) and developed mainly to provide a support to academic activities by both the students and lecturers in ITS [3]. The subject attendant file showing the students registering as members of SHARE-ITS e-learning was supplied by Mister Qomarudin, as a member of P3AI. It shows that the adoption of SHARE-ITS since 2006 is only found in 12 of totally 27 departments in ITS listing their subjects in SHARE-ITS [4].

There are some factors affecting such a low level of e-learning adoption, among other things: organization characteristics, business process, organization behavior and user characters, collectively requiring e-learning separate and tailored implementation methods to ensure effective, efficient and acceptable e-learning methods satisfying its users and enhancing their organizations [5]. The low level of acceptance by lecturers to adopt SHARE-ITS certainly lead to e-learning minor benefits to support academic activities in ITS. When more deeply observed, it is found that lecturer factually become one of essential elements affecting the successful adoption of e-learning [6]. A lecturer is a human domain affecting successful e-learning adoption. Such a low level of acceptance is certainly inconsistent with the primary objectives of SHARE-ITS development as an effective and efficient academic media for both the students and the lecturers [6].

The purpose of the research is to have better understanding to acceptance to SHARE-ITS adoption by the lecturers in

Sepuluh Nopember Institute of Technology (ITS). The research adopted Unified Theory of Acceptance and Use of The Technology (UTAUT) Model, developed by Venkatesh, et al [7]. UTAUT Model is widely adopted in academic settings by many researchers to evaluate e-learning acceptance. In the research [8] it is found that the level of acceptance to UTAUT model was 75% compared to the one of TAM model that is empirically more often adopted.

II. LITERATURE REVIEW

A. Previous Research

A research on acceptance of e-learning with UTAUT Model was conducted by Prastiwi (2014). It was to detect inter-related factors influencing the level of acceptance of e-learning as teaching-learning academic activities among freshmen in Budi Luhur University Jakarta. The research instruments comprised 6 variables of predictors comprising: Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Attitude toward Using e-learning and Acceptance to use e-learning and 2 variables of Moderators comprising gender and faculty. The UTAUT model test results showed that the Performance expectancy, Effort Expectancy and Social Influence brought positive and significant impact to Attitude Toward Using E-Learning among freshmen in Budi Luhur University. The Facilitating condition did not have positive and significant impact to acceptance to use e-learning, while attitude toward using e-learning system impacted positively, but insignificantly, to acceptance to use e-learning. The Gender had significant impact to effort expectancy and social influence, affecting acceptance to use e-learning. The Faculty brought significant impact to effort expectancy, facilitating condition and social influence affecting acceptance to use e-learning [9].

B. Unified Theory of Acceptance and User of Technology (UTAUT)

UTAUT Model is a theory of acceptance advocated by [7] and developed from combination of 8 theories of IT Adoption comprising the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT) and Social Cognitive Theory (SCT).

UTAUT theory is formulated with 4 core determinants to intention and adoption of information technology and 4 moderators to main relationship. The 4 moderators consist of gender, age, experience and voluntariness of use. The following is a conceptual UTAUT Model that is also adopted in this research:

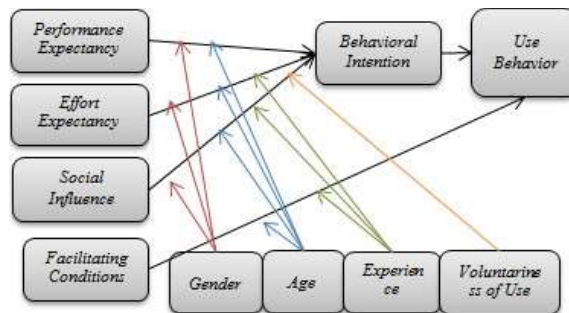


Figure 1. Conceptual Model using UTAUT

Performance Expectancy is defined as level of trust of an individual to the extent of system adoption helps users to improve their job performance [7]. The performance expectancy cited in this research represents whether SHARE-ITS adoption affects productivity, effectiveness and quality of outputs attained by lecturers in their lecturing activities.

Effort Expectancy represents the level of ease in relation with the system adoption and reducing efforts (energy and time) of an individual in undertaking his jobs [7]. The Effort Expectancy cited in this research is SHARE-ITS Adoption that is supposed to enhance efficiency and ease among lecturers in undertaking their lecturing activities.

Social Influence is defined as an extent when an individual perceives that others have influences to convince him that he is to adopt the new system. The social Influence referred in this research is SHARE-ITS adoption in accomplishing lecturing activities among the lecturers and affecting social status in their departments.

Facilitating Conditions is a level of trust of an individual towards technical and organizational infrastructure availability for supporting the system [7]. The Facilitating Condition quoted in this research refers to SHARE-ITS Adoption to drive efficient academic activities of lecturers when supports, i.e.: supporting human resources or facilities contribute s in the SHARE-ITS adoption.

Behavioral Intention is defined as level want and intention of the users to adopt the system time to time [7]. The Behavioral Intension cited in this research refers to the level of wants and intention of lecturers to consistently adopt SHARE- ITS ensure effectiveness and efficiency in their lecturing activities.

Use Behavior is defined as intensity and or frequency of the users in utilizing information technology. The behavior of the information technology users much relies on their evaluation over the system [7]. The Use Behavior mentioned in this research suggests the level of intensity or frequency of lecturers in using SHARE-ITS to support their lecturing activities. The frequency of SHARE-ITS use depends much on how lecturers evaluate and perceive the SHARE-ITS that they use.

III. RESEARCH METHODOLOGY

A. Planning Phase

It is the first phase in the research methodology and comprises 4 processes: research model designing, research variable designing, research information exploration designing and questionnaire testing.

The research methodology formulation is supposed to identify a method of research object identification is going to be adopted. It serves as a platform for analyzing each data and model testing in the research. This thesis research will adopt quantitative approach to analyze data based on the research questions. The data are explored through surveys by distributing research questionnaire to respondents and analyzed quantitatively and statistically through scientific calculations based on the responses to questionnaire given by the sample respondents. This quantitative analysis method is restrictedly used for processing the responses from the respondents.

The conceptual model of the research is formulated based on UTAUT Acceptance Model as it conforms with the preliminary research needs in the line with the level of acceptance of SHARE-ITS by users. The research hypothesis is formulated to identify the relationships between dependent variables and independent variables as strengthened by moderating variables and based on the set conceptual model. The variables, indicators and statements are established based on the UTAUT Acceptance Model that consist of dependent variables, independent variables and moderating variables. Each of the dependent variables and independent variables has indicators adoptable to formulate statements. The formulations of variables, indicators and statements are based on the research Venkatesh et al (2003).

The subjects of the research were baccalaureate program lecturers in Sepuluh Nopember Institute of Technology (ITS), Indonesia. To ensure questionnaire evaluation accuracy, it requires certain respondent minimum limit as advocated in theory of Slovin. The results of the sample measurement based on number of ITS lecturers involved in the population is 152 that have used SHARE-ITS and the level of sample accuracy by 90% is 60 respondents.

$$n = \frac{152}{1 + 152 \times (0,1)^2} = 60 \text{ (after rounded)}$$

The prepared questionnaires will be distributed to lectures using SHARE-ITS appointed as respondents both on-line and off-line. In the questionnaire testing involves 30 respondents responding 41 items of questions used in the research:

Table 1 – List of Questions

I perceive that SHARE-ITS:	
1	akes my lecturing activities easier .
2	is relevant to be adopted for certain subjects only.

3	improves my lecturing productivity .
4	brings benefits in my lecturing activities.
5	gives value added to for me as a lecturer.
6	offers new experience in my lecturing activities.
7	is the only e-learning compatible with my electronic equipment
8	improves my lecturing performance (for instance : online quizzes that make me easy to evaluate the achievement of my students).
9	crafts my lecturing quality better .
10	facilitates me to be more creative in managing the content in electronic lecturing (For instance : adding structured lecturing, such as : uploading video in SHARE-ITS).
11	does not affect my lecturing performance .
12	Is confusing when used .
Using SHARE-ITS, it:	
13	enables me to complete some lecturing activities more effectively (For instance : making problem solving exercises, delivering lecturing materials, etc.)
14	is more efficient for integrating academic activities between the students and lecturers (for instance : the students are capable of learning the lecturing materials uploaded in SHARE- ITS, such as : PPT, video, etc.) more deeply.
15	enables me to complete my academic assignments more rapidly.
16	enhances the success opportunities for my students .
17.	makes my lecturing activities more complicated .
18.	Brings benefits to better image towards my department.
I can easily :	
19.	learn how to operate SHARE-ITS.
20.	operate some features in the SHARE-ITS.
21.	use SHARE-ITS in my lecturing activities.
I use SHARE-ITS due to :	
22.	my own will .
23.	influence from someone (For instance : working peers).
24.	many working peers using it.
25.	expectation of my department to me to use SHARE-ITS.
26.	expectation of institution, via P3AI, to me to use SHARE-ITS.

27.	functions of SHARE-ITS in accordance with the needs in my lecturing activities.
28.	special instructions or order from the Head of my department.
29.	adoption of SHARE-ITS in other departments motivating me to use it.
30.	my determination to keep using SHARE-ITS in the future if my department supports it.
31.	Institution does not expect me to use SHARE-ITS in my lecturing activities.
I am comfortable to use SHARE-ITS since :	
32.	There is someone in my department helping to use SHARE- ITS.
33.	The administration officer always helps me when facing difficulty to use SHARE-ITS.
34.	The Head of Departments fully supports the use of SHARE-ITS in my lecturing activities.
35.	I have competence to use SHARE-ITS.
36.	I have opportunities to use SHARE-ITS.
37.	I have skills in information technology.
38.	Trainings in using SHARE-ITS provided by P3AI make me have additional skills to use SHARE-ITS.
I believe that:	
39.	My skill in information technology serves as an important factor in using SHARE-ITS
40.	It is difficult to change to lecturing system supported by SHARE-ITS
41.	The training for using SHARE-ITS by P3AI is important for supporting my competence.

B. Implementation Phase

Use Instrument testing is first conducted in this phase. The testing is supposed to identify the extent of accuracy, validity and reliability of the measurement instruments. It is conducted by testing the reliability and validity using SPSS software. The results of the testing showed that all items in the statements are valid and reliable. Next, it proceeds with descriptive statistical analysis to represent the results of questionnaire data processing descriptively.

Classically, assumption test is adopted to get assurance that, in estimating, the regression equation consistent and not bias. Accordingly, testing on classical assumptions is applied to identify whether or not there is any bias [10]. The classical assumption test is completed by testing the normality, multicollinearity and heteroscedasticity. The results of test on all data show that the data are good and descent.

The next step in the implementation phase is conducting inferential analysis. In this analysis, the model is tested using SmartPLS software. In the testing, the measurement of outer model and inner model is analyzed. The measurement to outer model is to identify the validity and reliability of items of indicator statements in a variable, by identifying the values of convergent validity, discriminant validity, composite validity, and average variance extracted (AVE). The result of convergent validity test is valid when the value of loading factor in all indicator items is greater than 0.7. The result of discriminant validity test on each variable is good, as each variable has the highest loading factor in the inter correlation between variables compared to the one of correlations between variables. The result of composite reliability test on each variable is good. This is to the value of composite reliability of all variables is greater than 0.7, while the value of cronbach’s alpha of the same is greater than 0.6. The final testing is Average Variance Extracted (AVE). It shows that AVE value of each variable is good, as it is greater than 0.5. Accordingly, it is conclusive that all variables in this research are valid and reliable in representing the scores of original data.

The completion of the measurement of outer model is followed with the one of inner model. The results of the inner model measurement show that not all variable relationships have positive regression coefficient and the significance is greater than 1.68. There are three variable relationships with positive regression coefficient with level of significance greater than 1.68. It shows that the relationship between independent variables and dependent variables is positive. The following is the R-square resulted by SmartPLS:

Table 2 – Result of R-Square (Processed by SmartPLS, 2015)

R Square of Latent Variable	
Variable	R Square
B1	0.919
UB	0.721

Based on the above Table, it shows that the value of R-Square in dependent variable, i.e.: behavioral intention, is greater than 0.919. It shows that the variability of behavioral intention can be explained by the independent variables, i.e.: performance expectancy, effort expectancy, and social influence by 91.9%. The R-Square value of variable of use behavior is greater than 0.521. It shows that the variability of the use behavior can be explained by the independent variable of facilitating conditions by 72.1%.

IV. RESEARCH AND DISCUSSION

A. Hypotheses Test

It is to identify whether the hypotheses formulated based on the conceptual model are rejected or accepted. It is conducted by observing that value of path coefficient resulted

from bootstrapping process in the structural model. The following are the hypotheses proposed in the research:

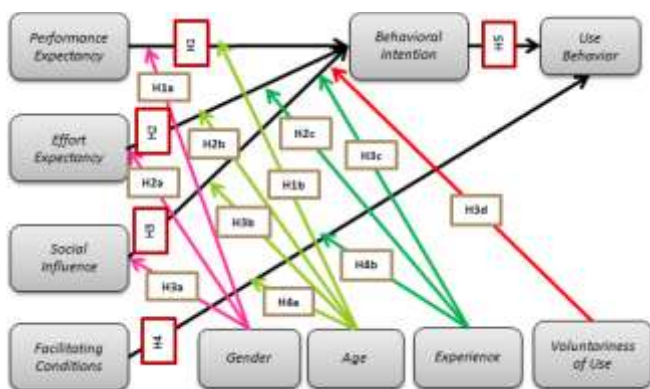


Figure 2. Research Hypotheses (Researcher, 2016)

A hypothesis is acceptable when having positive loading factor and its T-statistical value is greater than of T-table value (T-Table = 1.68).

The following are results of hypothesis test:

Table 3 : Values of Path Coefficients (Processed by SmartPLS, 2016)

Hypotheses	Loading Factor	T-Statistical	Remarks
PE → BI	0.164	0.747	Influencing & Insignificant
Gender.PE → BI	0.149	0.754	Influencing & Insignificant
Age.PE → BI	-0.084	0.351	Not Influencing & Insignificant
EE → BI	-0.039	0.242	Not Influencing & Insignificant
Gender.EE → BI	-0.092	0.605	Not Influencing & Insignificant
Age.EE → BI	-0.058	0.328	Not Influencing & Insignificant
Experience.EE → BI	0.028	0.191	Influencing & Insignificant
SI → BI	0.049	0.409	Influencing & Insignificant
Gender.SI → BI	0.056	0.524	Influencing & Insignificant
Age.SI → BI	0.062	0.277	Influencing & Insignificant
Experience.SI → BI	0.049	0.223	Influencing & Insignificant
Voluntariness of Use.SI → BI	0.076	0.506	Influencing & Insignificant
FC → UB	0.398	2.187	Influencing & Significant
Age.FC → UB	0.258	1.456	Influencing & Insignificant
Experience.FC → BI	-0.179	0.830	Not Influencing & Insignificant
BI → UB	0.464	3.156	Influencing & Significant

With reference to the above table, it shows that there are only 2 acceptable hypotheses that are influencing & significant, i.e.: the ones explaining relationship between FC-UB and BI-UB relationships.

B. Influence of Variables of Facilitating Conditions to Use Behavior

Based on the results of inferential analysis it is found that the variables of facilitating conditions positively and significantly affected behavioral intention as the facilitating conditions affects the use behavior with loading factor of 0.398 (positive) and the value of T-Statistical is 2.187* (T-statistical > T-Table). The estimate value is adopted to explain that there is a positive relationship between facilitating conditions and use behavior, while the value of T-statistical that is greater than the one of T-Table is used to explain the significant relationship between facilitating conditions and use behavior. It is conclusive that facilitating conditions has **positive and significant relationship** with the use behavior.

C. Effect of Variable of Behavioral Intention to Use Behavior

Based on the results of inferential analysis it is found that the variables of behavioral intention positively and significantly affected use behavior as the behavioral intention affects the use behavior with loading factor of 0.464 (positive) and the value of T-Statistical is 3.156* (T-statistical > T-Table). The estimate value is adopted to explain that there is a positive relationship between behavioral intention and use behavior, while the value of T-statistical that is greater than the one of T-Table is used to explain the significant relationship between behavioral intention and use behavior. It is conclusive that behavioral intention has positive and significant relationship with the use behavior.

D. Influence of Moderate Variables to Independent and Dependent variables

Based on the results of the hypothesis test, it shows that all independent variables controlled by the moderate variables are rejected. In this research, the independent variables comprise performance expectancy, effort expectancy, social influence and facilitating conditions and the dependent variables consist of behavioral intention and use behavior that are all not affected by moderate factors encompassing adopted gender, age, experience, and voluntariness of use.

V. CONCLUSION

Based on the results of the research on implementation of UTAUT Model to identify the factors affecting the acceptance of SHARE-ITS by lecturers, it is concluded as follows:

1. Based on the implementation of UTAUT Model acceptance with the proposed conceptual model of the research and calculation by means of SmartPLS application, it is found that the factors affecting the

acceptance of SHARE-ITS by lecturers are as follows:

- Facilitating conditions affected positively and significantly to use behavior with estimate value of 0.398 and T-Statistical value of 2.187*.
 - Behavioral intention affected positively and significantly to use behavior with estimate value of 0.464 and T-Statistical value of 3.156*.
2. Based on the result of model test, it is found that the R-Square on BI variable is 0.919, and on UB variable is 0.521 based on goodness of fit. It indicates that the test result is well accepted.
 3. Based on the results of inferential analysis using SmartPLS, it is found that:
 - Based on the results of hypothesis test, it is found that lecturers agree if the facilitating conditions are factors to be improved as they affect the success of the lecturers when using SHARE-ITS.
 - Based on the results of hypothesis test, it is found that lecturers agree if behavioral intention is one of factors to be improved as it affects the success of the lecturers when using SHARE-ITS.
 - In this research the independent variables (performance expectancy, effort expectancy, social influence and facilitating conditions) and dependent variables (behavioral intention and use behavior) do not affect moderate variables (gender, age, experience, and voluntariness of use), at all.
 4. To improve the acceptance by lecturers to SHARE-ITS in their lecturing activities it is recommended to improve it. Based on the results of discussion, it is identified that there are 7 proposals from open questions indicated on the questionnaire, comprising recommendations, problems and supports to SHARE-ITS.
 5. The following are recommendations for relationship improvement in this variable:
 - Providing training and socialization about SHARE-ITS to lecturers. The present training programs provided by P3AI needs to be completed with additional training program, specifically training on multimedia content production. Such training is the product of awareness on the importance of quality content of lectures through e-learning. Therefore, it is expected that through such training, there will be

creation of various virtual classes offering different Learning Experience compared to the ones in face-to-face in class sessions [11]

- Coordinating with the server and ITS internet networks administrator, i.e.: ITS Information Technology System Development Center (LPTSI) to provide stable internet connections.
- Summarizing SHARE-ITS features into more compact and user friendly one.
- Hiring one in the department to serve as SHARE-ITS Administrator to assist the lecturers when facing problems in using SHARE-ITS.
- Giving reward or appreciation as well as incentives for lecturer using SHARE-ITS and nominated in certain category.
- Cooperating with institutional authorities to set a policy on use of SHARE-ITS in lecturing activities.
- Offering IT Awareness Training Programs to ITS lecturers.

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