Estimation of Technology Acceptance Model (TAM) on the Adoption of Technology in the Learning Process Using Structural Equation Modeling (SEM) with Bayesian Approach

1st Elok Fitriani Rafikasari
Department of Islamic Economic, Faculty of Islamic Economic and Business
UIN Sayyid Ali Rahmatullah Tulungagung
Tulungagung, Indonesia
elokfitriani@ymail.com

2nd Nur Iriawan
Department of Statistics, Faculty of Science and Data Analytics
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
nur_i@statistika.its.ac.id

***Abstract*—Employing computers in the learning technology becomes very important in every classroom learning activity. In fact, the use of computers technology in classroom, however, is often ignored and very rare. Therefore, it is necessary to do a research on teachers' perception of acceptance in the use of computers technology in their teaching and learning process inside classroom. The most appropriate method to measure the level of acceptance technology adoption is TAM. This method is structured as a hierarchical structure and the analysis requires an appropriate statistical analysis tools, namely SEM. There are some assumptions which must be fulfilled in the SEM analysis, including large sample size, and all of the observed value must be multivariate normally distributed. These requirements are frequently cannot match with the conditions in the real world therefore, SEM would not be applicable. This research was conducted to only 30 teachers on SMP BSS Malang by employing Bayesian SEM which is proposed to overcome the restriction to fulfill the SEM requirement. The results show that technology acceptance during the learning process in this school are influenced by Perceived Ease of Use and Perceived Usefulness which are dominated significantly by Subjective Norm, Innovativeness, Training, Experience and Facilitating Conditions.**

Keywords—bayesian, learning process technology, SEM, TAM

I. INTRODUCTION

Progressing global competition of technology application makes it important along with every side of people's effort, that is education. The using of educational technology on education process is one of key factor on educator's success. It also has advantage to component of computer on learning activity in the classroom, but in the classroom, it is always neglected and the using is minimum (Lim and Khine, 2006 on [1]). This factor is unfortunately because its function on learning has important rule of students' learning activity in the classroom so that the students can understand visual lesson by using technology that integrate with the curriculum (American Psychological Association, 1997 on [2]). Research based on teacher's perception in the using computer to process learning activity in the classroom needs to be analyzed as far as the receiving technology of computer by the teacher.

Some of models that are applied to analyze and understand many factors affect acceptance information technology each other, Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM). Davis on [3] said that the most appropriate method to measure the level of acceptance to this technology adoption is Technology Acceptance Model (TAM). The effectiveness of TAM on knowing adoption acceptance of technology has been acknowledged by researchers [4].

The application of TAM on education that is ever conducted is about receiving technology of computer by teacher and find out that teacher has authority on his or her learning activity including using technology (Ma, Anderson and Streith, 2005 on [1]). The development of teacher's positive behavior on the computer must be important as indicator of the effectiveness of using computer in the classroom (Lawton and Gershner, 1982 on [1]). TAM has two variables that influence level of acceptance and using of technology. The first variable is Perceive Ease of Use (PE) and second variable is Perceive Usefulness (PU) (Davis, 1989 on [1]). The factors in the TAM will correlate each other as ordinary and graphical Causal Modelling. This method is structured as a hierarchical structure and the analysis requires an appropriate statistical analysis tools, namely Structural Equation Modeling (SEM).

Analysis of SEM that includes model of analysis factor has been used widely in every knowledge board. SEM is one of multivariate technique that combines multiple regression aspect (examining correlation of mutualism) and factor analysis (describing an unmeasured concept with multiple variables) to estimate mutualism correlation as simulate so [5]. According to [6] classification of SEM is latent variable that has linier correlation and all of the observed value must be multivariate normally distributed. SEM will produce a valid equation when its assumption fulfills.

There are some assumptions which must be fulfilled in the SEM analysis, including large sample size in normal theory or it have to be wider its sample when it uses ADF (Asymptotically Distribution Free) approach to manage abnormal data [7], linear relationship between latent variables, and all of the observed value must be multivariate normally distributed. These requirements are frequently cannot match with the conditions in the real world and, therefore, SEM would not be applicable [6]. SEM with Bayesian approach proposed to overcome the restriction to fulfill the SEM requirement and it does not has to fulfill assumption that was on the standard SEM. Bayesian SEM is referenced by Markov Chain Monte Carlo (MCMC) but reliable for small sample size does not depend on the asymthotic theory. On the other

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hand, estimation score of latent variable can be gotten through posterior simulation of MCMC uses Gibbs Sampler algorithm [6]. MCMC of Gibbs Sampler algorithm makes posterior analysis simpler than classical method [8].

The main purpose of this research is to make model of technology acceptance in the learning process by teacher's SMP Brawijaya Smart School Malang. It can be known by teacher's perception of acceptance in employing computer technology on the learning process in the classroom according to structure of Technology Acceptance Model (TAM) using Structural Equation Modeling (SEM) with Bayesian approach.

II. Literature Review

A. Technology Acceptance Model (TAM)

In 1989, Davis describes Technology Accpentance Model (TAM) that is applicated to understand the bahaviour and motivational factors so that its influences adoption and the using Information Technology (IT). The main TAM model is theoryof reasoned action that states one premis reactes. Someone's point of view will decide attitude and behavior. According to the user of IT will affets his or her attitude in receiving it. The factor that influences his or hers is the advantage as a rasionable action on using technology. Finally, someone's reason about the advantage of IT is become as refision in the receiving technology. The conclussion is the usefulness and ease of use is believed to decide moral and dignity of the user and receiver's adoption of the Information technology [4].

B. Structural Equation Modeling (SEM)

SEM is method that is capable to show correlation simultaneously between indicator's variables which is directly observed than laten's variables which is indirectly observed. Raykov and Marcaulides defines latent's variable is theory or important constructive hypothesis that has no sample or population being observed directly. Most of characteristics of SEM according to [9] is the following: (i) SEM model cannot be measured indirectly and defined well, (ii) SME model Figures out problem potential of measurement in every observation variable, especially independent variable and (iii) SEM model is very right to be formed matrix that connect its every variable such as covariance and correlation matrix.

SEM is an integrated approach of Confirmatory Factor Analysis (CFA) and Path Analysis. According to [9], CFA and Path Analysis is the SEM model. Path Analysis can be used to observe the correlation about observed variable. Some of researchers suppose that it does not include in SEM model, nevertheless they acknowledge that it is something important. CFA Model used to examine model of relationship between several latent construct including some of that is measured through observed indicators. Bollen defines latent variable is unobserved factor. It is differentiated in two those are exogenous and endogenous variables. Exogenous variable is latent variable that cannot be influenced by another one, while endogenous variable is latent variable that can be affected by another one [10]. According to Bollen these are the equation model of its variable:

$$\boldsymbol{\eta} = \boldsymbol{B\eta} + \boldsymbol{\Gamma\xi} + \boldsymbol{\zeta} \tag{1}$$

with:

$\boldsymbol{B}$ = mxm coefficient matrix of endogenous latent variable

$\boldsymbol{\Gamma}$ = mxn coefficient matrix of exogenous latent variable

$\boldsymbol{\xi}$ = qx1 exogenous variable vector

$\boldsymbol{\eta}$ = px1 endogenous variable vector

$\boldsymbol{\zeta}$ = px1 error vector in equation

q = number of exogenous variable (q=n)

p = number of endogenous variable (p=m)

with assumptions: $E(\boldsymbol{\eta}) = 0; E(\boldsymbol{\xi}) = 0; E(\boldsymbol{\zeta}) = 0;$ ζ not correlated with $\boldsymbol{\xi}$; and $(\boldsymbol{I} - \boldsymbol{B})$ is nonsingular matrix.

Another latent variable, SEM also familiar with observation variable. It is named with manifest variable, measures indicator and proxies. It is differentiated into two those are observed variable of exogenous latent variable and endogenous latent variable. The following form of observed variable is:

$$\boldsymbol{x} = \boldsymbol{\Lambda_x\xi} + \boldsymbol{\delta} \tag{2}$$

$$\boldsymbol{y} = \boldsymbol{\Lambda_y\eta} + \boldsymbol{\varepsilon} \tag{3}$$

with:

$\boldsymbol{y}$ = px1 indicator vector of $\boldsymbol{\eta}$,

$\boldsymbol{x}$ = qx1 indicator vector of $\boldsymbol{\xi}$,

$\boldsymbol{\varepsilon}$ = px1 error measurement for $\boldsymbol{y}$,

$\boldsymbol{\delta}$ = qx1 error measurement for $\boldsymbol{x}$,

In CFA, $\boldsymbol{\xi}$distributes $N(0, \boldsymbol{\Phi})$ with covariance matrix for $\boldsymbol{\Phi}$is definite positive so that variance and covariance matrix x of is the following formulated:

$$\boldsymbol{\Sigma} = \boldsymbol{\Lambda\Phi\Lambda^T} + \boldsymbol{\Psi_\varepsilon} \tag{4}$$

SEM model that discusses above is named standard SEM or also called LISREL model. In standard SEM, the valid results requires several assumptions that must be fulfilled including latent variables must be multivariate normally distributed, large sample size, between indicator variable and another latent variable have linier relationship [7]. Just like on a standard SEM, SEM with the Bayesian approach also consists of common observation variables and structural equation. Analogous to equation (2) and (3), the equations of observation variables which will be used next is:

$$\boldsymbol{y_i} = \boldsymbol{\Lambda\omega_i} + \boldsymbol{\varepsilon_i} \tag{5}$$

with$\boldsymbol{\omega_i} = \left(\boldsymbol{\eta_i^T}, \boldsymbol{\xi_i^T}\right)$, $\boldsymbol{\omega_i}$partitioned into q_1x1 endogenous latent variable vector $\boldsymbol{\eta_i}$, and q_2x1 exogenous latent variable vector ξ_i . So that structural equation that explains correlation between endogenous latent variable and exogenous latent variable are:

$$\boldsymbol{\eta_i} = \boldsymbol{\Pi\eta_i} + \boldsymbol{\Gamma\xi_i} + \boldsymbol{\delta_i} \tag{6}$$

with $\Pi_{q_1 x q_1}$ and $\Gamma_{q_1 x q_2}$ are parameter matrix of regression coefficient, and $\delta_i$are error vector (q_1x*1*).

C. Adoption of Learning Technology

Learning technology is looked as tool of technology that correlates with using tool and media to reach goal of education or to teach by supporting audio – visual. It is part of three components that correlate each other, media of education, learning psychology and approaching system on the education [11]. Paradigm of Learning Technology in

1994 defines that learning technology as arranging theory and practice, developing, benefitting, managing, and evaluating the process and resource of learning (Seels and Richey, 1994 on [12]).

Information Technology (IT) in education has potential to improve education intuitively. Unfortunately, many reasons that using technology of education on learning and teaching activity are a economical and dangerous. But there is reason that technology of education can give good education. The effectiveness of education technology can be known whether it can give certain result and adopted to apply continually (Davis, 1989 on [13]). Learning technology can improve teaching of education. It has make simple experiment to change teaching method in the schools and universities (Moser, 2007 on [14]). The main of learning technology is media of communication that develops quickly and it can be beneficiate in education.

III. Analysis and Discussion

A. Data Sources and Analysis Methods

This study uses primary data that collected from a survey on 30 teachers of SMP Brawijaya Smart School Malang. The questionnaire in this study consisted of 29 questions related to teachers' perceptions of SMP Brawijaya Smart School Malang in the acceptance of technology in the learning process. The question is an indicator for the latent variables and the external main latent variables in TAM. In the perception fill in the questionnaire, the respondents' answers in the form of a Likert scale bounded in 5 (five) categories ranging from "Strongly Disagree" to "Strongly Agree".

The main variable in this study is, Perceived Usefulness (PU), Perceived Ease of Use (PE), Behavioral Intention to Use (BI) and the Actual System of Use (AU). PU and PE in TAM influenced by external variables. In this study, the external variables identified by previous studies using the TAM and also based on the real condition of the object of research. External variables that used in this study is the Subjective Norm (SN), Innovativeness (I), Training (T), Experience (E) and Facilitating Conditions (FC).

Analysis methods of this research is as follows:

1) Determine the basic TAM model design appropriate educational technology to model acceptance by teachers of SMP Brawijaya Smart School Malang
2) Determine the variables thought influence the acceptance of educational technology by teachers of SMP Brawijaya Smart School Malang
   a. Determine the observation variables for each latent variable
   b. Constructing a questionnaire survey
   c. Conducting the survey
   d. Perform data entry survey
3) Perform the TAM model estimation for educational technology acceptance by teachers of SMP Brawijaya Smart School Malang using SEM with Bayesian approach
   a. Determine the measurement model and the structural model
   b. Determine matrix the parameters to be estimated
   c. Calculate the threshold (α) for each research variable to change the categorical data into continuous data (Y) with $N(0,1)$ distribution
   d. Determine the prior distribution for each parameter to be estimated
   e. Applying MCMC with Gibbs Sampler algorithm for the full conditional posterior distribution of the model to acquire and parameter estimation
   f. Validation of the model

B. Descriptive Data Analysis

The result of the questionair appeared that 91% respondent chooses high category, 35 % is third category (agree), 20% is fourth category (more agree), and 36% is fifth category (strongly agree). A chosen category is third category (agree) and fifth category (strongly agree). Mean score, deviation standard and coefficient is descriptive analysis that is explained on the Table 1.

TABLE I. Mean Value, Standard Deviation, and Skewness Coefficient for Each Indicator Variable

VAR	MEAN	STDEV	SKEW	VAR	MEAN	STDEV	SKEW
SN1	3,367	1,15917	0,20537	FC3	3,233	1,0063	0.582
SN2	3,5	1,25258	-0,169	PU1	4,433	0,77385	-0.958
I1	4,167	0,87428	-0,344	PU2	4,4	0,77013	-0.854
I2	3,467	1,07425	0,182	PU3	4,167	0,91287	-0.351
I3	4,333	0,8023	-0,699	PU4	4,533	0,68145	-1.179
T1	3,867	0,81931	-0,144	PE1	3,733	0,94443	0.582
T2	3,833	0,94989	0,096	PE2	3,9	1,02889	0.008
T3	3,767	1,07265	-0,217	PE3	3,6	1,06997	0.174
T4	3,3	1,05536	0,098	PE4	3,7	0,83666	0.636
T5	3,233	0,93526	0,039	BI1	3,867	0,9732	0.042
E1	4,2	1,15669	-1,421	BI2	4,033	0,92786	-0,069
E2	4,1	0,95953	-0,462	BI3	3,867	0,9371	0,012
E3	4,267	0,86834	-0,568	AU1	3,533	1,30604	-0,725
FC1	3,1	1,18467	-0,205	AU2	4,333	0,88409	-1,057
FC2	3,067	1,11211	0,183				

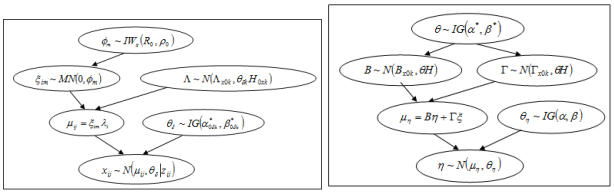
According to questionair result and skewness coefficient that is appeared on the Table 1 can be concluded that data distribution has more curved in the left than normal distribution. This is caused by category frequency that correspondents' answers have high score.

C. Validity and Reliability of Research Instrument

The result of validity uses Pearson Product Moment. It showed that all variables can be explained valid by co-efficient validity r-count > r-table of level significant 5% with smaller coefficient 0.62 and higher 0.946. Reliability test appeared that all variables with smaller alpha is 0.59 according to [15] and higher alpha is 0.914.

D. Bayesian SEM Estimation

Before doing estimation using Bayesian's approach, firstly the data is changed becoming continue data of distribution N (0.1) with deciding threshold score because the questioner result showed respondents' answer tend to high category [6] deciding threshold is conducted by every frequency category on the indicator variable then counting propotition and its cummulative under normal distribution with the zero mean and variance equal to one to get the threshold value and determining α_0 as minimum threshold value is – 100 and α_5 as maximum threshold value is 100.



(a) (b)

Fig. 1. Prior Distribution Structure for (a) Measurement and (b) Stuctural Equation

Next step is determining prior distribution that is used. It is conjugate prior that focuses on Lee's research (2007) in where on Fig. 1 show prior distribution structure for measurement and structural equation that is used. It completes of its parameter can be see on the Table 2.

TABLE II. PRIOR DISTRIBUTION

No	Parameter Model
1	$\Theta_{\delta} \sim$ Invers Gamma(10,8)
2	$\Theta_{\varepsilon} \sim$ Invers Gamma(10,8)
3	$[\Lambda_x \mid \theta_{\delta}] \sim$ Normal$[0.6;4\theta_{\varepsilon}]$
4	$[\Lambda_y \mid \theta_{\delta}] \sim$ Normal$[0.6;4\theta_{\varepsilon}]$
5	$\xi \sim$ Multivaria te Normal $(0,\phi)$
6	$\phi \sim IW\left(\begin{bmatrix} 8.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 8.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 8.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 8.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 8.0 \end{bmatrix},30\right)$
7	$\Theta_{\eta} \sim$ Invers Gamma (10,8)
8	$\beta \sim$ Normal (1.1;10.0θ)
9	$\gamma \sim$ Normal (1.5;9.0θ)
10	$\theta \sim$ Invers Gamma(10,8)

The result of estimation uses WinBUGS being gotten parameter estimation for λ on TAM model that all significant range between 0.5069 – 1.049. This shows that all indicators be able to explain its measured latent variable. There is relationship between PE and PU that not significant. The matrix of structural equation is:

$$\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} = \begin{bmatrix} 0 & 0.3832 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0.3048 & 0.6412 & 0 & 0 \\ 0 & 0 & 0.8537 & 0\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix}$$

$$+\begin{bmatrix} 1.147 & 1.172 & 1.238 & 1.728 & 1.202 \\ 1.205 & 0.9868 & 0.9813 & 1.688 & 0.9967 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0\end{bmatrix}\begin{bmatrix}\xi_1\\ \xi_2\\ \xi_3\\ \xi_4\\ \xi_5\end{bmatrix}+\begin{bmatrix}\zeta_1\\ \zeta_2\\ \zeta_3\\ \zeta_4\end{bmatrix}$$

Before being interpretation the result of estimation, firstly it must be done analysis on latent variable to know the effectiveness of the model. Latent variable analysis is done by regressing the factor score of each exogenous latent variable with endogenous latent variable based on the model. To know accurate relationship is done test of Lack of Fit (LOF) to know quallivite of the model produced. The result of LOF test showed that there is a significant of LOF score. That is between ξ_1 and η_1 so it is possible that the relationship between ξ_1 and η_1 has nonlinear pattern and nonlinear pattern are thought to occur due to the quadratic effect of latent variable ξ_1. Matrix structural equations of nonlinear models is as follows:

$$\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix} = \begin{bmatrix} 0 & -0{,}8185 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0{,}2246 & 0{,}5917 & 0 & 0 \\ 0 & 0 & 0{,}8476 & 0\end{bmatrix}\begin{bmatrix}\eta_1\\ \eta_2\\ \eta_3\\ \eta_4\end{bmatrix}$$

$$+\begin{bmatrix} 1{,}118 & 0{,}8646 & 1{,}045 & 1{,}051 & 1{,}044 & 1{,}242 \\ 1{,}119 & 0{,}2586 & 0{,}4872 & 0{,}2298 & 0{,}6851 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0\end{bmatrix}\begin{bmatrix}\xi_1\\ \xi_2\\ \xi_3\\ \xi_4\\ \xi_5\\ \xi_1^2\end{bmatrix}+\begin{bmatrix}\zeta_1\\ \zeta_2\\ \zeta_3\\ \zeta_4\end{bmatrix}$$

Parameter estimation of nonlinear TAM model is conducted by adding prior distribution. The result showed that there are six nonsignificant relationship there are 1) the using easy perception (PE) by the usefulness perception (PU), 2) Innovativeness (I) with PE, 3) Innovativeness (I) with PU, 4) Training (T) with PE, 5) Experience (E) with PE and 6) Facilitating Condition (FC) with PE.

Selection of the best model is conducted by differenting structural equation error score between linear SEM and nonlinear SEM. The model of smallest structural equation error is a good model. Table 3 shows it in every model. From the table is known that it is for smaller linear model than nonlinear model.

TABLE III. ERROR OF STRUCTURAL EQUATION TAM MODEL ON THE ADOPTION OF TECHNOLOGY IN THE LEARNING PROCESS

Error Structural Equation	Linear Model	Nonlinear Model
ζ_1	-0,11349	-0,18064
ζ_2	-0,09501	-0,14294
ζ_3	-0,0174	-0,03473
ζ_4	0,078416	0,073727

Selection of the best model is also done through the calculation of Bayesian Information Criterion (BIC). The best model which made the selection of the best model has a smaller BIC value [16]. BIC value for SEM TAM on nonlinear models ($BIC_{Nonlinier}$) is:

$$BIC_0 = -2\log\left\{|\Psi_{\varepsilon}|^{-n/2} exp\left[-\frac{1}{2}\sum_{i=1}^{n}(y_i - \Lambda\omega_1)^T\Psi_{\varepsilon}^{-1}(y_i - \Lambda\omega_1)\right]\right\}$$
$$+ d_0 \log n = 268{,}51 + (121x\log 30) = 446{,}783$$

BIC values for SEM TAM on linear models (BIC_{Linier}) is:

$$BIC_1 = -2\log\left\{|\Psi_{\varepsilon}^*|^{-n/2} exp\left[-\frac{1}{2}\sum_{i=1}^{n}(y_i - \Lambda^*\omega_i^*)^T\Psi_{\varepsilon}^{-1}(y_i - \Lambda^*\omega_i^*)\right]\right\}$$
$$+ d_1 \log n = 240{,}9 + (120x\log 30) = 418{,}154$$

Comparison of BIC_{Linier} with $BIC_{Nonlinier}$ for TAM on the adoption of technology in the learning process is:

$$BIC_{01} = BIC_0 - BIC_1 = 446{,}783 - 418{,}154 = 28{,}628$$

The results of the difference BIC value is equal to 28.628, which means that there is a strong enough reason to choose SEM TAM linear models as a better model.

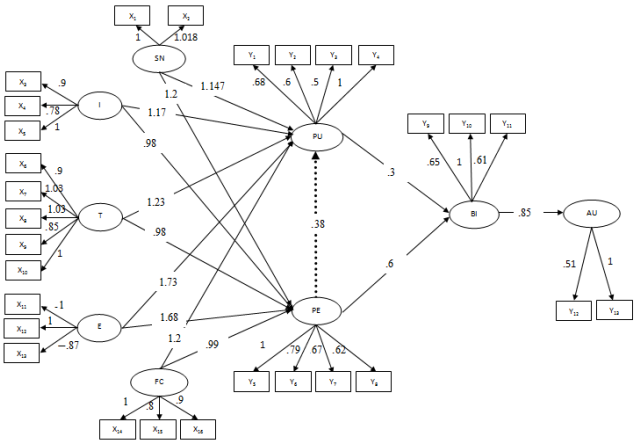


Fig. 2 Structure of SEM TAM Estimation Result on the Adoption of Technology in the Learning Process

After being gotten it, the next is conducted interpretation the result of the good model that is linear model. Fig. 2 above shows the result of SEM TAM estimation of Technology Adoption of Learning Process clearly and completely with it's the structure of relationship. From that, it is gotten result that all external variables affect significantly through the advantage of perception (PU) and easy perception (PE). Subjective Norm (SN) influences significant through PE and PU because technology adoption on the learning process that has mandatory at SMP Brawijaya Smart School Malang. It still has not enough mandatory. This affects to the teachers still using their subjective perception when they use it. This will be different if it has enough. The teachers must use computer in every teaching and learning without priorifying their subjective perception.

Innovativeness (I) of using computer will affect a positive and significant on the PU and PE. This case can be looked on teachers' question that states they has been usual using computer to make learning matery creatively such as animation game's education that improves students' interest to enjoy the learning process. Training (T) affects a positive and significant on the PU and PE. The effect of this research can be looked up to the teachers' opinion states that it is given be able to help understanding computer. It is also given making media base ICT. The level of teachers on understanding computer and ability to make learning media can improve after this training. Experience (E) uses computer directly measuring to know teachers' perception through their experience. It has positive and significant through PE and PU because learning activity uses computer is conducted almost every day so that it will affect easy directly and many advantages. Facilitating Conditions (FC) can be looked up that there is facility of the school such as guiding that will help the teachers that find out difficulty on using computer. This facility will affect positive and significant to the PU and PE because it will help them to improve their perception on using it.

The relationship between PE and PU is not significant because Operating System (OS) that is used on the teachers' computer at SMP Brawijaya Smart School Malang uses OS Windows that has been completed by many easy ones to operate it such as Microsoft Office Word, Microsoft Office Excel, and Microsoft Office PowerPoint. Facility that has been supplied Microsoft helps them to operate computer so that it can develop learning activities from making learning process, learning stuff up to learning evaluation. The positive effect of it can give many advantages for them so that the correlation between PE and PU is significant. The correlation latent variable is between PE and PU show a positive and significant. It means that those affect significant through someone's tendency on using computer and someone's habitual actions on better learng process.

IV. Conclusions

TAM model that matches to demonstrate technology on the learning process by teachers' SMP Brawijaya Smart School of Malang is TAM with four major variables and five external variables. TAM model has 29 indicator variables that become measuring variable of major variable and external variable. The acceptance teachers' SMP Brawijaya Smart School of Malang on the technology adoption of learning process can be known based on the perceive Ease of Use (PU) and Perceive Usefulness (PE). Variable that affects significant on the PE and PU are Subjective Norm (SN), Innovativeness (I), Experience (E), Training (T) and Facilitating Conditions (FC). Those affect on someone's tendency using computer and someone's habitual action on using computer everyday so that they can progress well.

References

[1] Teo, T., Lee, C.B. and Chai, C.S., "Understanding Pre-Service Teachers' Computer Attitudes: Applying and Extending the Technology Acceptance Model", Journal of Computer Assisted Learning 24, pp. 128-143, 2007.

[2] Wozney, L., Venkatesh, V. and Abrami, P.C., "Implementing Computer Technologies: Teachers' Perceptions and Practices", Journal. of Technology and Teacher Education 14(1), pp. 173-207, 2006.

[3] Khosrow-Pour, M., "Case on Information Technology and Business Process Reengineering", Idea Group Publishing, United States of America, 2006.

[4] Lee, Y.C., Li, M.L., Yen, T.M. and Huang, T.H., "Analysis of Adopting an Integrated Decision Making Trial and Evaluation Laboratory on a Technology Acceptance Model", Journal of Expert System with Application, Chung-Hua University, Taiwan, 2010.

[5] Hair, J.F., Anderson, R.E. and Tatham, R.L., "Multivariate Analysis, 5 Edition", Prentice Hall International, Inc., 1998.

[6] Lee, S. Y., "Structural Equation Modeling: A Bayesian Approach", John Wiley & Sons, Ltd., 2007.

[7] Lee, S.Y. and Song, X.Y., "Evaluation of the Bayesian and Maximum Likelihood Approaches in Analysing Structural Equation Models with Small Sample Sizes", Multivariate Behavioral Research Vol. 39 No.4, pp. 653-686, 2004.

[8] Anggorowati, M.A., Iriawan, N., Suhartono and Gautama, H., "Restructuring and Expanding Technology Acceptance Model: Structural Equation Model and Bayesian Approach", American Journal of Applied Sciences 9(4), pp.496-504, 2012.

[9] Raykov, T. and Marcoulides, "A First Couse in Structural Equation Modeling", Lawrence Erlbaum Associates, USA., 2006.

[10] Bollen, K.A., "Structural Equation with Latentt Variables", Dept. of Sociology The University of North Carolina, Chapel Hill North Carolina, 1989.

[11] Sudrajat, A., "Teknologi Pembelajaran", akhmadsudrajat.wordpress.com/2008/04/20/teknologi-pembelajaran/, 2008

[12] Setyosari, P., "Isu-isu Terkini dalam Pengembangan Penelitian TEP", tep.ac.id/berita-isuisu-terkini-dalam-pengembangan-penelitian-tep-.html, 2008

[13] Teo, T., "Technology Acceptance in Education", Rotterdam/Boston/Taipei: Sense Publishers, 2011.

[14] Zhu, C., "Teacher Roles and Adoption of Educational Technology in the Chinese Context", Journal for Educational Research Online, Volume 2 (2010), No. 2, pp.72-86, 2010.

[15] Hair, Jr., Black, B., Babin, B., Anderson, R.E., and Tatham, R.L., "Multivariate Data Analysis", 6th edition, Prentice Hall, 2006.

[16] Anggorowati, M.A., "Pengembangan Metode Estimasi SEM Non-Standar pada Analisis Technology Acceptance Model", Disertasi, Surabaya: Program Pascasarjana, Institut Teknologi Sepuluh Nopember, 2013.