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ORIGINAL RESEARCH

MEASURE THE SIGNIFICANCE OF LEARNING VALUE AND TRUST FACTORS FOR ONLINE LEARNING TECHNOLOGY ACCEPTANCE IN INDONESIA

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Abstract

One of the main stages to achieve the success of online learning technology is accepting the technology by its users. Therefore, identifying how significant the influence of a factor in technology acceptance is very important. This study aims to measure the significance of learning value and trust factors on the acceptance model of online learning technology. To test the research hypothesis used the Partial Least Square Structural Equation Modeling (PLS-SEM) method. This research is a quantitative study with a survey approach to respondents, where respondents must have used online learning technology. The study results show the influence of learning value and trust factors on the acceptance of online learning technology is significant. The study results can be taken into consideration for providers of online learning technology in Indonesia as a reference in making strategic decisions for further development.

KEYWORDS:

Online Learning, Partial Least Square, Structural Equation Modeling, Technology Acceptance, Technology Adoption

1 | INTRODUCTION

The advancement of information technology has significant impacts on many aspects of human beings, including education. The most typical usage of information technology for education is online learning. Online learning is one of the best developments that occur in this era. Students no longer have to be in the same place as the teacher to study. Time problems can be flexible, not bound to be at the same time. Changes in times that are very fast making a gap in technology. It is one of the problems of how technology can be accepted by society at large. This trend brings a fundamental paradigm shift in education [1].

Numerous online learning types need to be commensurate with the required kind of education, whether for people, schools, universities, or organizations. With the goal of training or education, online learning can be used to accomplish standard education objectives with less effort, cost, and time [2]. Online learning consisted of one of the learning styles, together with remote learning, computer-aided learning, and online learning [3].

The useful application of online learning tools depends upon the users' perception and, likewise, their knowledge and abilities in using computer systems. Such significant factors have been shown to impact users' initial approval of computer technology and their future behavior regarding the usage of web-based learning systems [4, 5].

1.1 | Previous Research

In his research, Panigrahi state that understanding e-learning adoption, continuation, and learning outcomes in online platforms is essential in ensuring the successful implementation of technology in learning and achieving maximum benefits [6]. Henderson et al. suggested that information technology played a central role in teaching at universities. A broad introduction to technology-based education will require fundamental changes to institutions to meet the needs of 21st-century students and society [7]. Other studies on online learning conducted by Ain et al. showed that learning value affected students' intentions to use Learning Management System [8]. Also, research from El-Masri and Tarhini confirms that the trust factor is an essential consideration in e-learning adoption studies, so it is hoped that trust will influence students' behavioral intentions to use e-learning systems [9]. Engle et al. studies student demographics from a MOOC called Coursera. They found that 29.5% of students aged 18-25 years, and about 30.3% were aged 26-34 years [10]. RuangGuru, one of the leading online learning technology providers in Indonesia, has more than 6 million users. Based on this reference, we conclude that Indonesia already has quite many users of online learning technology.

1.2 | Research Purpose

This study aims to measure the significance of learning value and trust factors on the acceptance model of online learning technology. The existence of online learning technology has brought significant changes, especially regarding the dissemination of educational content. The condition of the supporting infrastructure for online learning implementation is still not fully distributed in all regions in Indonesia. The existence of the internet, which is the main requirement for online learning continuity, has become an obstacle for some people in Indonesia.

1.3 | Online Learning

At present, the learning process is an essential factor in business and socio-economic growth, where the role of information and communication technology grows and has an innovative impact. Learning, education and training using traditional classroom methods and emerging online techniques all lead to increasing ways to invest in people, increase their capacity and reach out to the masses while reducing costs, time, and effort [11].

Electronic learning is one of the most well-known technologies found to make the process of traditional education more accessible with the help of software applications and virtual learning environments [12]. Online learning and training are gaining popularity throughout the world, reducing the temporal and spatial problems associated with traditional education [6]. The main factors behind the use of online learning are to improve access to education and training and the quality of learning and reduce costs and increase the effectiveness of education costs [7].

At this time, online learning was ubiquitous, using the internet as a platform. Online learning technology not only provides courses/lectures but also serves certification and granting academic degrees online.

2 | MATERIAL AND METHOD

2.1 | Proposed Method

The research method is a step and procedure carried out to achieve goals and obtain answers to research problems. These steps and procedures are an embodiment of the framework of the research methodology. There are four main stages, as shown in Figure

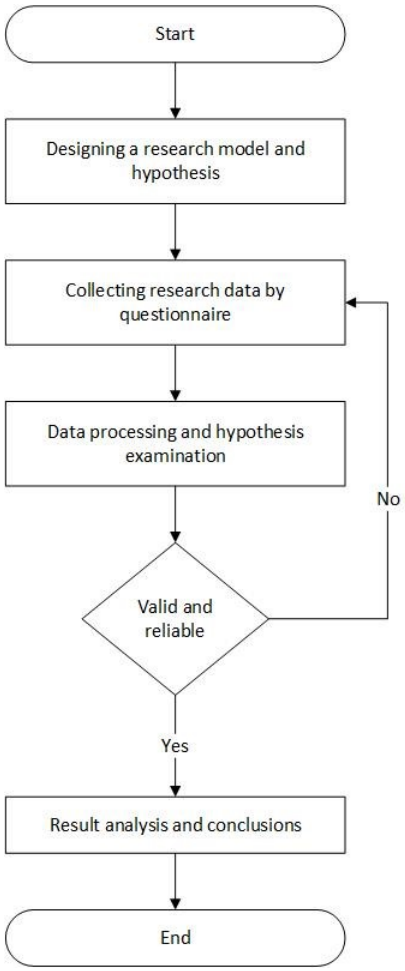

FIGURE 1 The framework of proposed method.

1. The first stage is designing a research model and hypothesis. The second stage is collecting research data by questionnaire. The third stage is processing data and examining the hypothesis. The last stage is analyzing the result and drawing conclusions.

The researcher starts this study by looking for and learns about the problems, then proceeds with determining the study's purpose, which is to find out the significance of learning value and trust factors on the acceptance model of online learning technology in Indonesia.

After determining the problem and research objectives, the researcher conducts a study related to research. At this stage, the researcher conducts a literature study process regarding the literature related to research to determine and understand its scope. Literature studies are sourced from international journals, books, and previous research related to the research that will be conducted.

2.2 | Designing a Research Model and Hypothesis

This study uses a conceptual model based on previous studies and new findings that have been empirically tested, as shown in Figure 2. This research is a quantitative study with a survey approach. A quantitative method is a scientific approach that sees a reality that can be classified, concrete, observable, and measurable. The variable relationship is causal, where the research data is in the form of numbers. The analysis uses statistical methods[13].

Trust is defined as individuals' willingness to accept vulnerabilities because of positive expectations about the intentions or behavior of others in situations characterized by interdependence and risk[14].

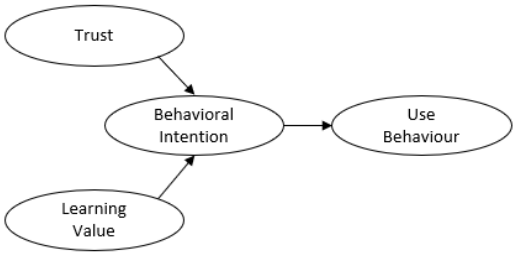

FIGURE 2 The conceptual model.

Based on literature related to technology adoption, the trust factor is found to be the primary predictor of behavioral intention[15–18] and in e-learning[19–22]. The user's decision will be dominated by security issues and trust when using a system/technology. Personal interest in using online learning technology ultimately depends on trust in the system, so if the level of trust is sufficient, individuals are more likely to adopt it.

The choice of Trust construct is based on Mazen El-Masri and Ali Tarhini, where they include Trust in their models because the results of their research show that trust is an influential factor that can influence technology adoption. Students' intention to use the e-learning system ultimately depends on the level of confidence in the system, so if the level of trust is sufficient, students are more likely to adopt it[9].

Learning Value. Based on the definition of price value proposed by Venkatesh, the Learning Value can be defined as a cognitive exchange between the value of perceived benefits compared to the time and effort needed to use it[8]. From a consumer perspective, a product or service holds value if it provides benefits. In other words, learning value is positive when the benefits of adopting technology are considered to be higher than the time and effort needed.

The choice of learning value construct was based on Noor Ain, Kiran Kaur, and Mehwish Waheed, where they researched the Learning Management System. Their study extends the UTAUT2 framework by integrating the Learning Value construct to predict student intention towards LMS and its use. Their research results indicate that learning value has a significant effect on student interest in LMS[8].

Behavioral Intention. Behavioral Intention is a variable that states a person's level of intention to use online learning technology. Studies in psychology have found that experience can be a moderate effect of behavioral intentions on Use Behavior. Verkatesh conducted a study that showed that car use frequency reduces the effect of behavioral intentions on car use in the future[18].

Hypothesis Determination. The research hypothesis is defined as follows:

H1 Learning Value has a significant effect on Behavioral Intention.

H2 Trust has a significant effect on Behavioral Intention

H3 Behavioral Intention has a significant effect on Use Behavior

2.3 | Collecting Research Data by Questionnaire

This study uses a media questionnaire to collect data. The questionnaire form questions are in the form of structured questions whose alternative answers have been provided. There are two types of structure of questions used. The first type is multiple-choice questions. In this question, the researcher chooses answers, and the respondent is asked to select one or more answers that have been provided. This type of question is used to find out the profile of the respondent. The second type is scale. Questions using a scale are used to measure and determine the respondent's responses regarding the questionnaire's questions. The research questionnaire used the Likert scale method with 5 points.

Pilot Study. Before conducting primary data collection by distributing questionnaires, researchers conducted a pilot study first. At this stage, the research instrument was tested, namely the questionnaire. The purpose of this test is to test whether the questionnaire used has fulfilled the requirements as a measuring instrument that is good and following the standards of the research

method. The testing is done by testing the validity and reliability test. In testing the validity and reliability, researchers used 50 respondents similar to respondents in the actual data collection. Also, this stage aims to find out whether the questionnaire questions can be understood by the respondents so that they can provide appropriate answers. If there is a deficiency in the questionnaire that has been made, the questionnaire will be improved. This improvement will be re-tested until a questionnaire is formed in which questions can be understood and do not cause ambiguity for the respondents. The last improvement questionnaire will be distributed to all samples to get the data that will be used in this study.

Validity and Reliability Test. Validity is closely related to the accuracy of an indicator in measuring something that should be measured. The scale accuracy of the measurement instrument used will guarantee that the measuring instrument used (statement on the questionnaire) is following the object to be measured. Reliability is related to the extent to which a measurement result produces relatively consistent results if an instrument is used repeatedly. Errors in measurement will result in different results in measuring something in common. Reliability is determined by repeatedly measuring the construct or variable attraction. The higher the relationship between scores obtained through repeated measurements, the more reliable it will be.

2.4 | Data Processing and Hypothesis Examination

Data processing and hypothesis examination in this study use the SEM method. Data Processing. In data processing, analysis and assessment will be carried out using Structural Equation Modeling (SEM). SEM is a statistical technique that can analyze the pattern of relationships between latent constructs and indicators, latent constructs with each other, and measurement errors directly. SEM allows direct analysis between several dependent and independent variables[23].

There are two approaches in Structural Equation Modeling (SEM), namely: Covariance Based-SEM (CB-SEM) and Variance Based-SEM (VB-SEM) with Partial Least Squares- Structural Equation Modeling (PLS-SEM) technique. CB-SEM focuses more on building a model intended to explain covariances of all construct indicators, while PLS's purpose is a prediction. The PLS approach is more suitable because it assumes that all variance measures are useful variances to explain.

PLS is a powerful analytical method because it can be used on any type of data scale (nominal, ordinal, interval, and ratio) without using many conditions for assumptions that must be fulfilled[24]. The following steps will be carried out in this study:

1 Preliminary Analysis. At this stage, the researcher will examine the questionnaire filled in by the respondent. This check is done to determine whether or not a questionnaire is appropriate for further use.

2 Frequency Distribution. Data obtained from a questionnaire that is still in the form of random data can be made into grouped data, namely data that has been compiled into certain classes.

3 PLS-SEM Analysis. The completed questionnaire will then be processed using PLS-SEM (Partial Least Square-Structural Equation Modeling).

At this stage, the outer model and inner model will be tested. The outer model test is used to test the validity of the model's variables and a reliability test to determine whether the construct has good reliability to be tested further. In contrast, the inner model test or structural test is conducted to determine how much influence behavioral intention and use behavior in the acceptance of online learning technology using the calculation of R2. A variable analysis will be carried out, which influences the acceptance of online learning technology with t-value analysis using bootstrapping on PLS-SEM.

Hypothesis testing. Hypothesis testing is based on this research model and its hypotheses. After the data is processed with PLS, it will produce a P value (P-value). This P value will be used to decide whether the hypothesis is accepted or not by comparing it with alpha (α) = 5% with the following two conditions.: First, P-value $\leq$ value α, then the decision is the hypothesis accepted. The accepted hypothesis means that there is a significant effect of the independent variable on the dependent variable. Second, P-value> α value, then the decision is the hypothesis is rejected. The rejected hypothesis means that there is no effect of independent variables on the dependent variable.

2.5 | Result Analysis and Conclusions

Results analysis of the hypothesis test will be carried out. The analysis results will show the relationship between variables that affect the acceptance of online learning technology. The results of this analysis will later become the basis for making

TABLE 1 Variables and Indicators.

Variable	Indicator	Description
Learning Value (LV)	Benefits compared to effort (LV1)	Technology is worth more than the effort (good value for the effort).
	Ease of interaction (LV2)	Technology makes it easy to share knowledge with others easily.
	Learning opportunities (LV3)	Technology provides an opportunity to decide the speed of learning.
	Opportunity (LV4)	Technology provides an opportunity to increase knowledge.
Trust (TR)	User interests (TR1)	Trust in technology service providers that prioritize user interests.
	Trustworthy (TR2)	Technology service providers can be trusted.
	Performance (TR3)	Systems in technology have good performance.
	Security (TR4)	Safe technology system.
Behavioral Intention (BI)	Intention (BI1)	Intention to continue to use technology in the future.
	Habits (BI2)	Use technology in everyday life.
	Interest in use (BI3)	Interest to continue to use technology as often as possible.
Use Behavior (USE)	Duration (UB1)	Duration of using technology.
	Intensity (UB2)	The intensity of using technology.

conclusions from the research conducted. The conclusion will answer the problem at the beginning of the study. The results of these conclusions can be used as a reference for online learning technology service providers and recommendations for further development.

2.6 | Variables and Indicators

The description of variables and indicators of this research is shown in Table 1. Relation Between Variables and Indicators. The relation between variables and indicators in this research is reflective wherein the measurement model of manifest variables (indicators) associated with latent variables (constructs) reflects variations of latent variables so that causal relationships that occur come from latent variables leading to indicators.

Reflective models are used because measurements are developed from the translation of concepts into indicators. The manifest variable associated with the latent variable is assumed to measure the indicator that manifests the construct. Indicators are seen as effects of latent variables that can be observed empirically.

2.7 | Research Population and Samples

Observations on research cannot be observed on all individuals in a population because the population is too large, and the area is vast, or the research costs are limited. So most existing research is using sample techniques. The sample is part of a population used to describe the population. By using the right method, samples can be used to describe the condition of a population accurately.

The population of this research is all Indonesian residents who have used online learning technology. In this study, the sampling was done by non-probability sampling with an accidental sampling technique. Accidental sampling is a technique for taking samples based on the chance of anyone who is accidentally encountered and is considered appropriate.

This research requires that respondents must have used online learning technology. The research questionnaire data is 225 questionnaires. These data are used as samples for further analysis. The data collected in this study is primary data. Primary data is obtained by distributing questionnaire forms, namely structured data collection, in a questionnaire. This questionnaire will be distributed online to various social media using a digital questionnaire form, namely Google Forms. Questionnaires will also be distributed offline to respondents using questionnaire paper. The method used in filling out the questionnaire was a self-administered survey, where the respondent himself filled in the questionnaire.

The questionnaire questions about online learning technology are formed from information on the variables to be studied. In this study using four variables consisting of two independent variables (Learning Value and Trust) and two dependent variables (Behavioral Intention and Use Behavior). Learning Value, Trust, and Behavioral Intention variables are measured using the

TABLE 2 Main questionnaire.

Variable	Item	Item Description
Learning Value (LV)	LV1	Online learning technology is worth more than my efforts (good value for the effort).
	LV2	In a shorter period, online learning technology enables me to share knowledge with others (for example, chat sessions, forums).
	LV3	Online learning technology allows me to decide on my learning speed.
	LV4	Online learning technology allows me to increase my knowledge (e.g., through quizzes, assignments/assessments).
Trust (TR)	TR1	I believe online learning technology service providers prioritize user interests.
	TR2	I believe online learning technology service providers can be trusted.
	TR3	I believe the system in online learning technology has a good performance.
	TR4	I believe the system in online learning technology is safe.
Behavioral Intention (BI)	BI1	I intend to continue using online learning technology in the future.
	BI2	I will always try to use online learning technology in my daily life.
	BI3	I plan to continue using online learning technology as often as possible.
Use Behavior (UB)	UB1	How long have you been using online learning technology?
	UB2	How often do you use online learning technology?

Likert scale (points 1-5) with the following details. Score 1 indicates strongly disagreement. Score 2 indicates disagreement. Score 3 indicates neutral. Score 4 indicates agreement. Lastly, score 5 indicates strongly agreement. While the Use Behavior variable is measured by two statements, namely, how long has it been using the online learning technology and how often to use the online learning technology. The Likert scale (poins 1-5) also used. Score 1 represents less than one month, 1-3 times per year. Score 2 represents between 1-3 months, 4-6 times per year. Score 3 represents between 4-6 months, 7-9 times per year. Score 4 represents between 7-12 months, 10-12 times per year. Lastly, score 5 represents more than 12 months, more than 12 times per year. The questions in the questionnaire cover various things, as listed in Table 2.

3 | RESULTS AND DISCUSSION

3.1 | Preliminary Analysis

The number of respondents to the questionnaire obtained in this study were 254 respondents. The questionnaire was collected for approximately six weeks through online and offline deployment, where 103 respondents filled out the questionnaire online and 151 respondents who filled out questionnaires offline obtained. The 254 respondents' data was filtered, namely only those who had used online learning technology so that only 227 respondents had data. As mentioned in chapter 3, an examination of the questionnaire needs to be done to determine whether a questionnaire is appropriate for subsequent analysis. After the inspection process was carried out, out of 227 questionnaires, two questionnaires were not feasible due to the tendency to fill all neutral or strongly agree to all the questions given so that the questionnaire data that can be processed for this study amounts to 225 questionnaires.

3.2 | Respondent Demographic

This study's demographic analysis was categorized based on gender, status, age, education, domicile, occupation, frequency of use, and experience using online learning technology. Based on 225 respondents who participated in this study, a summary of respondents' demographic data can be seen in Table 3.

3.3 | Validity and Reliability Test

In this study, the researcher conducts the validity and reliability test using SPSS software. The test results are shown in table Table 4 and Table 5. Based on the test results, it can be concluded that all variables are valid and significant.

3.4 | PLS-SEM Analysis

In this study, the researcher analyzed data using the Partial Least Square (PLS) approach. The researcher used SmartPLS 3.2.8 software to process research data. There are two stages of evaluation in the PLS, namely, evaluating the structural model (inner model) and evaluating the measurement model (outer model).

TABLE 3 Demographic summaries.

Category	Classification	Total	%
Gender	Male	71	32
	Female	154	68
Marital Status	Single	171	76
	Married	54	24
Age	<= 20 year	100	45
	21-25 year	45	20
	26-30 year	34	15
	31-35 year	32	14
	>35 year	14	6
Education	SMA	114	51
	D1/D2/D3	19	8
	S1/D4	56	25
	S2/S3	36	16
Location	Jakarta	12	5
	Jawa Barat	5	2
	Jawa Tengah	8	3
	Yogyakarta	4	2
	Jawa Timur	188	84
	Lainnya	8	4
Job	Jobless	2	0.9
	Student	110	48.9
	Entrepreneur	11	4.9
	Health workers	31	13.8
	Lecturer	25	11.1
	Government employees	11	4.9
	Private employees	27	12
	Others	8	3.6
Revenue	< Rp 2.500.000	125	56
	Rp. 2.500.000-Rp. 5.000.000	34	15
	Rp. 5.000.001-Rp. 7.500.000	34	15
	Rp.7.500.001-Rp.10.000.000	13	6
	> Rp. 10.000.000	19	8

TABLE 4 Reliability test results.

Path	Value	Description
TR → BI	0.709	Significant
LV → BI	0.528	Significant
BI → UB	0.293	Significant

TABLE 5 Validity test results.

Path	R	t	Description
TR → BI	0.303	4.749	Valid
LV → BI	0.692	14.310	Valid
BI → UB	0.504	8.719	Valid

3.5 | Creating a Structural Model (Inner Model)

The structural model of the research conducted by the researcher is shown in Figure 3. The structural model in this study is made by combining latent variables based on substance theory. The latent variable itself is divided into two types, namely exogenous variables and endogenous variables. In this study, the endogenous variables are Behavioral Intention and Use Behavior. Besides, these two variables are exogenous.

3.6 | Creating a Measurement Model (Outer Model)

This study's measurement model is done by connecting all manifest variables (indicators) with latent variables, where each latent variable must have at least one manifest variable. In PLS-SEM, a manifest variable (indicator) can only be connected to one latent variable.

The measurement model of research conducted by researchers is shown in Figure 4. The latent construct in this study is a latent reflective construct. In that model, the manifest variable blocks associated with latent variables are assumed to measure indicators that manifest constructs. These indicators are seen as effects of latent variables that can be observed empirically.

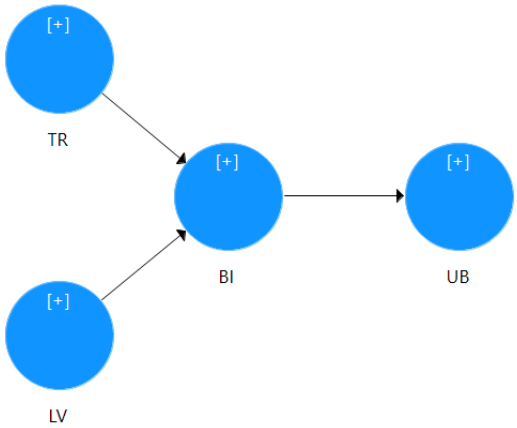

FIGURE 3 The structural model.

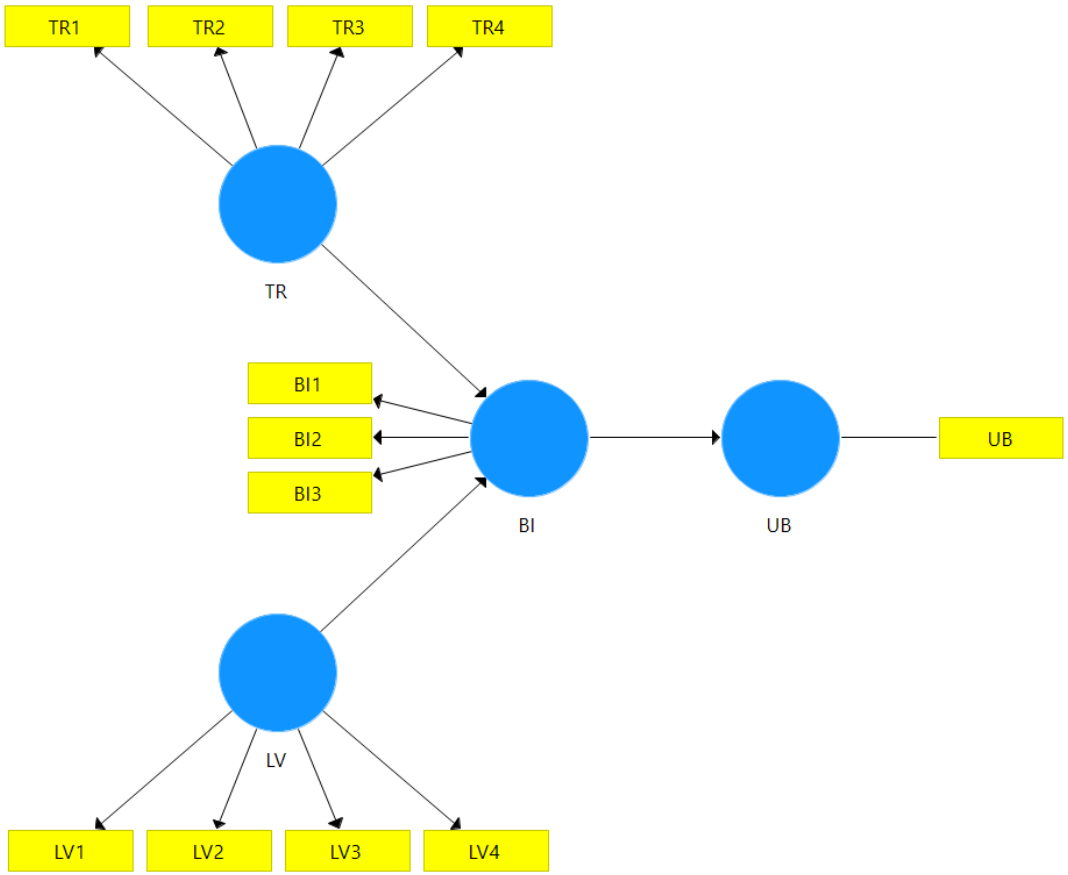

FIGURE 4 The measurement model.

3.7 | Indicator Reliability

The first step in evaluating the reflective measurement model is to do a reliability indicator check. At this stage, the process is to see the value of outer loading (loading factor). An indicator is declared good if it has an outer loading value > 0.7. The measurement results for outer loading are shown in Table 6, where all indicators are declared good.

TABLE 6 Value of convergent validity test (outer loading).

Indicator	Value	Indicator	Value
BI1	0.885	LV4	0.774
BI2	0.909	TR1	0.847
BI3	0.876	TR2	0.829
LV1	0.749	TR3	0.843
LV2	0.843	TR4	0.837
LV3	0.812	UB	1.000

TABLE 7 Value of internal consistency test.

Indicator	α	CR
BI	0.869	0.92
LV	0.806	0.873
TR	0.860	0.905
UB	1.00	1.000

TABLE 8 R2 Value of endogenous variable.

Variable	R2	Description
Behavioral Intention (BI)	0.527	Sedang/Moderate
Use Behavior (USE)	0.101	Lemah

TABLE 9 F2 variable effect test results.

Variable	F2	Description
BI → UB	0.047	weak effect
LV → BI	0.149	weak effect
TR → BI	0.040	weak effect

TABLE 10 Hypothesis test results.

Variable	T-Statistics	P-value	Hypothesis	Description
BI → UB	5.287	1.86e-7	H1	significant
LV → BI	11.473	5.68e-14	H2	significant
TR → BI	3.896	1.11e-4	H3	significant

3.8 | Internal Consistency Reliability

The process of internal consistency reliability in this study is done by examining the Cronbach's Alpha (α) and Composite Reliability (CR) value. The interpretation of this value is if the values of Cronbach's Alpha and Composite Reliability > 0.7, the construct is stated to have good reliability. From the value based on Table 7, it can be seen that the results of the internal consistency test for each variable have good reliability.

3.9 | Coefficient of Determination (R2)

The value of R2 is used to determine the predictive strength of the structural model. It can be used the R2 value of each variable[25]. R2 results from this study are presented in Table 8.

3.10 | F-Square Variable Effect (f2)

To measure the effect of each model path can be determined by calculating Cohen's value f2. The f2 effect value < 0.02 indicates no effect. The f2 test results from this study are shown in Table 9.

3.11 | Hypothesis Test

Based on the testing of the path coefficient significance using bootstrapping that has been done in the previous stage, it can be determined whether the hypothesis is declared significant or not significant. The criteria are alpha (α) = 5%, then the path coefficient is considered significant if the value of t-statistic ≥ 1,96 and the value of p-value ≤ 0.05. The results of hypothesis testing based on latent variables in this study are presented in Table 10.

Based on three hypotheses tested to assess the exogenous path coefficient of variables on endogenous variables, all three were declared significant. So that the final model is produced, as shown in Figure 5.

3.12 | The Effect of Learning Value on Behavioral Intention

The analysis results in this study indicate that Learning Value (LV) has a significant effect on Behavioral Intention (BI) in using online learning technology. LV describes the cognitive exchange between the perceived value of benefits and the time and effort needed to use it. The analysis results in this study are in line with the results of previous research conducted by Ain, which states that Learning Value has a significant effect on students to use the Learning Management System[8]. From a consumer

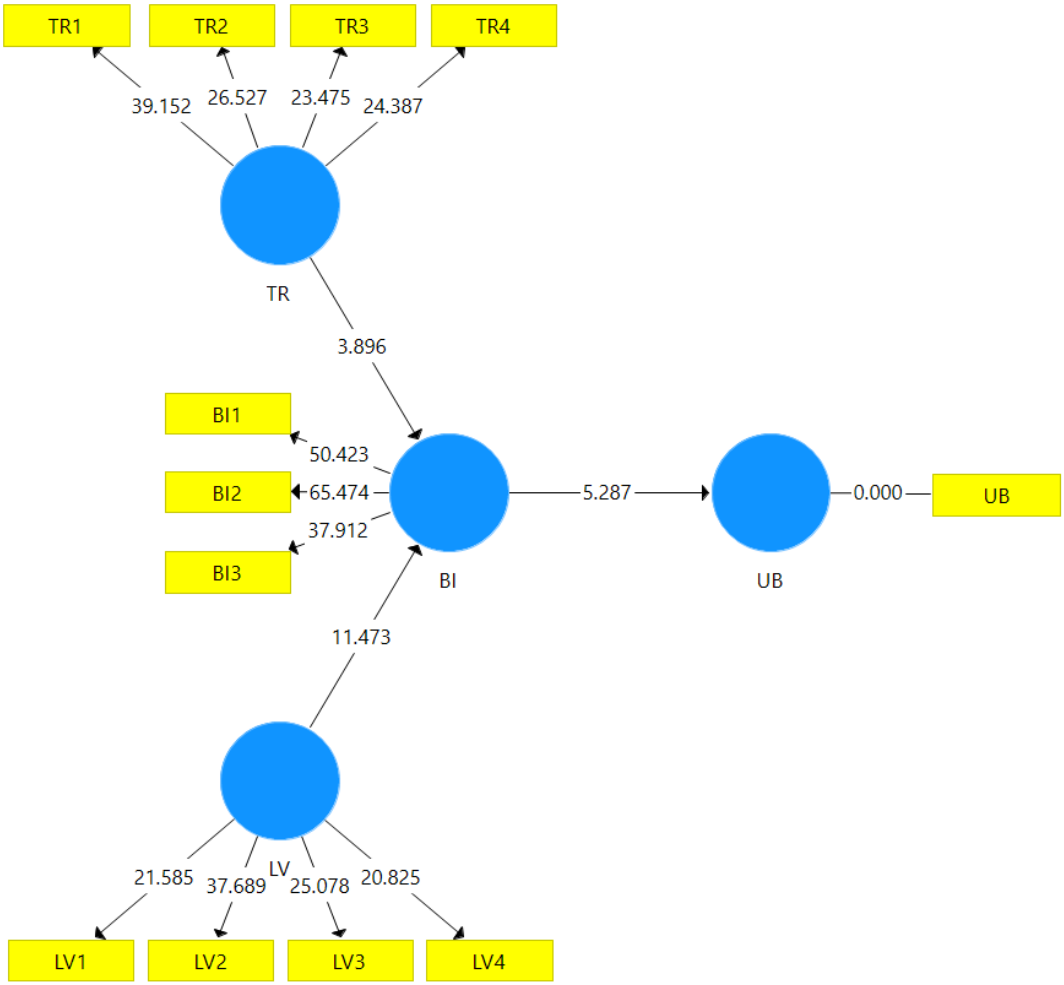

FIGURE 5 The structural model with path coefficient.

perspective, a product or service holds value if it provides benefits. In other words, a positive Learning Value when the benefits of adopting technology are considered greater than the time and effort needed.

3.13 | The Effect of Trust on Behavioral Intention

The analysis results in this study indicate that Trust (TR) has a significant effect on Behavioral Intention (BI) in using online learning technology. TR describes individuals' willingness to accept vulnerability because of positive expectations about the intentions or behavior of others in situations characterized by interdependence and risk[14]. The results of the analysis in this study are in line with the results of previous studies conducted relating to technology adoption, where trusts were found to be the main predictors of behavioral intention[15–18].

3.14 | The Effects of Behavioral Intention on Use Behavior

The analysis results in this study indicate that Behavioral Intention (BI) has a significant effect on Use Behavior (UB) in using online learning technology. Behavioral Intention is a variable that states a person's level of intention to use online learning technology. In contrast, Use Behavior is a variable that states the behavior of using online learning technology. The results of the analysis in this study are in line with previous studies in psychology that have found that experience can be a moderate effect of behavioral intentions on Use Behavior. Verplanken conducted a study that showed that car use frequency reduces the effect of behavioral intentions on future car use[26].

4 | CONCLUSION

From the results of field measurements, it was found that the noise level in existing conditions did not meet WHO standards both during the day and night, even though there were differences in noise conditions. There are two types of noise characteristics that are common in apartment buildings. The first is steady/continuous both during the day and at night, which is dominated by vehicles' sound from traffic. At dawn, the noise that occurs is a combination of vehicle noise and AC noise. But when the vehicle drove, the source of a noise coming from the AC was utterly inaudible because it was dominated by vehicles passing through the apartment building. The comparison of field measurements with simulation methods and calculations shows a high relationship so that the I-Simpa simulation method and calculation can be used to predict the desired noise level on a particular floor.

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