Analysis Of E-Learning Acceptance During Distance Learning Using Unified Theory Of Acceptance And Use Of Technology (UTAUT)

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Abstract

The new coronavirus disease that was first identified in Wuhan, China, is referred to as the 2019 coronavirus disease pandemic (COVID-19). The impact of this pandemic has affected various fields, one of which is education, and one of the consequences is the implementation of online teaching and learning processes. In this digital era, Telkom University is implementing CeLOE LMS as an E-Learning medium. CeLOE Learning Management System (LMS) is an online learning platform for regular and distance education study programs at Telkom University. For the application of CeLOE LMS, there has been no report that contains user acceptance of the use of CeLOE LMS that tested with an integrated model. Therefore, the solution offered by this research was to conduct an analysis to determine user acceptance of the application of the CeLOE LMS system by using the Unified Theory of Acceptance and Use of Technology (UTAUT) Model at Telkom University to produce report that can be used as a basis for further decision making by Telkom University in managing its services as the UTAUT Model attempts to clarify the intentions of students to use an information system and the usage actions of students. From this research, it was found that the CeLOE LMS has been accepted and used by Telkom University students with all hypotheses accepted, Performance Expectancy as the variable with the greatest influence, and it needs improvements related to technical infrastructure, organizational infrastructure, and socialization of CeLOE LMS due to the influence of Facilitating Conditions variable was the lowest.

Keywords— CeLOE LMS, COVID-19, Distance Learning, E-Learning, UTAUT.

1. INTRODUCTION

From the end of 2019 to 2020 has been the year when the whole world is brought together in a situation that all countries are not ready to face. Days turn to days, weeks turn to weeks, months turn months until we realize that this pandemic is not a temporary one, but we must be prepared to be faced with living with it until maybe years later. The disease caused by the novel coronavirus, which was first identified in Wuhan, China, is called the 2019 coronavirus disease (COVID-19) - 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Previously, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV' [1].

One of the impacts of the 2019–20 Coronavirus pandemic is on education around the world, which has led to the closure of large areas of schools, madrasas, universities, and Islamic boarding schools [2]. Communication in teaching and learning activities should be very effective, both between the teacher and the students and among the students themselves because the mechanism allows the student to get used to expressing opinions arguably and examining

himself, whether what he knows is true or not, so that quality communication can occur [3]. In his research, Setiawan stated that UNESCO (United Nations Educational, Scientific and Cultural Organization) on March 4, 2020 suggested the use of distance learning and opened an educational platform that schools and teachers could use to reach learners remotely and limit educational distractions [2][4]. E-learning is separate learning that utilizes computer technology and networks (web) [5]. Furthermore, the Ministry of Education and Culture (Kemendikbud) has also made policies as a guide in dealing with this pandemic at the educational unit level [6].

The concept of e-learning is a new ICT-based learning technology that has been accepted in education. This acceptance is very reasonable in the context of preparing human resources with ICT capabilities to solve employment problems and economic stability [7]. E-learning or distance learning methods are computer-based learning methods and internet networks with little social interaction with peers and instructors so that all learning content is delivered digitally [8].

The Unified Theory of Acceptance and Use of Technology (UTAUT) model is an integrated model developed by Venkatesh et al. (2003) based on social cognitive theory with a combination of eight leading research models regarding the acceptance of information technology [19]. UTAUT is a combined model based on basic theories regarding technology user behavior and technology acceptance models, namely TRA, TAM, TPB, Motivational Model, Personal Computer Utilization Model, Innovation Diffusion Theory, and Social Cognitive Theory (SCT) [11]. In her research, Izzati stated that the UTAUT model can portray a few characteristics into a variable but the UTAUT model does not look at user fulfillment or performance impacts [21][22]. In Nasir's research, The UTAUT model has proven successful from the other eight technology acceptance theories in explaining up to 70% of user variants. The UTAUT model then developed with the addition of several variables [20][18]. The UTAUT model has four key constructs, namely: performance expectancy, effort expectancy, social influence, and facilitating conditions which have an influence on behavioral intention to use technology. The purpose of UTAUT is to assess the likelihood of success of a new technology and understand the level of acceptance of users. After going through further testing, Venkatesh and his colleagues found four fundamental builds that play a vital part as a direct determinant of behavioral intention and use behavior, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions. Besides that, there are also four moderators: gender, age, voluntariness, and experience which are positioned to moderate the impact of the four main constructs on behavioral intention and use behavior [12]. Figure 1 illustrates UTAUT Model [18].

Figure 1. UTAUT Model

Performance expectancy is characterized as the degree to which an person accepts that utilizing the system will offer assistance for them to accomplish gains in work performance. The five constructs of the different models related to performance expectancy are perceived usefulness (TAM / TAM2 and C-TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative-advantage (IDT), and outcome expectations (SCT) [18]; Effort expectancy is defined as the level of convenience associated with using the system. Three constructs of the existing model concurrently have the concept of effort expectancy: perceived ease of use (TAM / TAM2), complexity (MPCU), and ease of use [18]; Social influence is defined as the extent to which an individual feel that other people believe that he must use the new system. Social influence as a direct determinant of behavioral intention is represented as a subjective norm in TRA, TAM2, TPB / DTPB and C-TAM-TPB, social factors at MPCU, and image in SLI. Thompson et al. (1991) use the term social norm in defining its construct and acknowledge its similarity with subjective norms in TRA [18]; Facilitating conditions are defined as the extent to which a person believes that there is an organizational and technical infrastructure to support the use of the system. This definition captures the concept epitomized by three distinctive builds: perceived behavioral control (TPB / DTPB, C-TAM-TPB), facilitating conditions (MPCU), and compatibility (IDT). Each of these constructs is operationalized to include aspects of the technology and / or organizational environment outlined to evacuate boundaries to utilize [18]; Behavioral Intention (BI) is the extent to which one's consciousness has been formulated plans regarding whether to perform certain future behaviors [13]; Use behavior is the intensity and / or frequency of users using information technology. The behavior of using information technology is highly dependent on the evaluation of users of the system [18]; Gender defines the gender-specific of the respondent; Age defines how old the respondent is; Experience defines the experience of respondents using a system; Voluntariness of Use defines the extent to which the use of innovation is considered voluntary, or out of free will [18].

2. METHODOLOGY

The type of research in this research is quantitative research. This research points to decide the level of user acceptance of the CeLOE LMS e-learning where this goal is conclusive. Then seen from the type of investigation, this research is classified as correlational research. For this research the authors also did not intervene in the data in their research. Furthermore, the unit of analysis chosen by the author in this paper is the individual unit. Finally, based on the implementation time, this research uses a cross-sectional method.

2.1 Stages

As for the stages in this research can be described as follows:

Figure 2. Research Stages

The research begins by identifying issues related to the acknowledgment and utilize of e-learning and understanding the background of the research. Then exploring existing theories to be used as a foundation in strengthening the author's research. Through this literature study, can be determined which variable that related to the problem and some provisional conclusions on the problem (hypothesis) also the analysis techniques that will be used by the author. Then formulating the questionnaires which later the results of the questionnaire will be used as data sources. The questionnaire was based on indicators that represent the variables in the research. The questionnaires that have been filled in by the respondents are collected so that they are used as data. Furthermore, the data that has been collected from the questionnaire will be processed using SPSS. From the results obtained, then the data were analyzed using the analytical method specified by the author. For the final, the author draws conclusions and provides suggestions for recommendations for next steps related to the research results.

2.2. Collecting Data Tools

There are three types of variables that used in this research, namely independent variables, dependent variables, and moderating variables. They are described as follows:

- Independent Variable

The independent variables in this research are Performance Expectancy (X1), Effort Expectancy (X2), Social Influence (X3), And Facilitating Conditions (X4).

- Dependent Variable

Dependent variables in this research are Behavioral Intention (Y1) and Use Behavior (Y2).

- Moderator Variables

The moderator variables in this research are: Gender (Z1), Age (Z2), Experience (Z3), and Voluntariness of Use (Z4).

Data collection methods used in this paper is primary data. Data obtained from primary data must be further processed. Primary data collection is done online using a platform called Google Form, an online questionnaire which is an innovation from Google. For the scaling, the research is using an ordinal scale. All indicators are measured using a Likert scale with a range of 1 to 5. Each number represents: number 1 – Strongly Disagree; number 2 – Disagree; number 3 – Neutral; number 4 – Agree; and 5 – Strongly Agree.

For the questionnaire, this research used 29 indicators or statements. In Performance Expectations measured by 8 statements; Effort Expectation measured by 5 statements; Social Influence measured by 6 statements; Facilitating Condition measured by 6 statements; Behavioral Intention measured by a statement; and Use Behavior measured by 2 statements. An explanation of the hypothesis with the relationship between variables can also be seen in Figure 3.

Figure 3. Hypothesis

Figure 3 above illustrates the hypothesis used in this research referring to the UTAUT model [18].

2.3. Data Analysis

In analyzing the data, this paper uses descriptive analysis, validity and reliability tests, classical assumption tests, simple linear regression analysis which includes the coefficient of determination along with the t-statistical test, and multiple linear regression analysis which includes the coefficient of determination test and the F test.

3. RESULT AND EXPLANATION

3.1. Pilot Test

This research was to begin with conducted to test the validity and reliability for the first time or moreover called pilot test. The validity test for questionnaire items used a significant level of 5% with 30 respondents. These items were tested using IBM SPSS Statistics 26 software. From the Product Moment *r* Value Table written in Sugiyono's book the *r* table value was 0.374 [15]. The following is table 1 summaries of the results of the validity test in pilot test consist of 29 questionnaire items with 30 respondent.

Table 1. Validity Test in Pilot Test

Item	Pearson Value	r-Table Value	Information
VU1	0.554	0.374	VALID
PE1	0.639	0.374	VALID
PE2	0.268	0.374	NOT VALID
PE3	0.753	0.374	VALID
PE4	0.461	0.374	VALID
PE5	-0.047	0.374	NOT VALID
PE6	0.598	0.374	VALID
PE7	0.642	0.374	VALID
PE8	0.769	0.374	VALID
EE1	0.445	0.374	VALID
EE2	0.4	0.374	VALID
EE3	0.406	0.374	VALID
EE4	0.178	0.374	NOT VALID
EE5	0.582	0.374	VALID
SI1	0.303	0.374	NOT VALID
SI2	0.412	0.374	VALID
SI3	0.586	0.374	VALID
SI4	0.638	0.374	VALID
SI5	0.676	0.374	VALID
SI6	0.475	0.374	VALID
SI7	0.724	0.374	VALID

Item	Pearson Value	r-Table Value	Information
FC1	0.416	0.374	VALID
FC2	0.498	0.374	VALID
FC3	0.761	0.374	VALID
FC4	0.473	0.374	VALID
FC5	0.476	0.374	VALID
FC6	0.736	0.374	VALID
BI1	0.767	0.374	VALID
UB1	0.529	0.374	VALID
UB2	0.431	0.374	VALID

Based on table 1, it is known that of all 29 variables, there are 25 variables that are declared valid because they have a pearson correlation value above the r table value. Meanwhile, the remaining 4, namely PE2, PE5, EE4, and SI1 were declared invalid.

The item deletion action is also carried out based on the person correlation value that does not exceed the r table value. In this case, the value of r table with a significance level of 5% is 0.374. Then, items that do not meet these conditions must be deleted for the variable to be valid.

Then performing data processing for reliability testing using the IBM SPSS Statistics 26 software which is presented in table 2 with the following results.

Table 2. Reliability Test in Pilot Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.901	30

Based on table 2, it is known that the Cronbach's alpha value of all statement item variables has a value of 0.901.

Obtained from Alhamdu in Safitri's research, table 3 below describes the range of Cronbach's Alpha reliability test scores [17] [9].

Table 3. Range of Reliability Test

Score	Information
0.80 – 1.0	Good
0.60 – 0.799	Acceptable
<0.60	Not good

Based on the table 2 and 3, it can be concluded that the value of 0.901 can be declared good.

3.2. Characteristics

The respondent's data were undergraduate students of Telkom University. The sample of this research was 100 respondents. The characteristics of the respondents were distinguished by gender, age, and experience in using e-learning.

Table 4. Characteristics of Respondents Based on Gender

Gender	Frequency	Percentage
Male	51	51
Female	49	49
Total	100	100%

Based on the results in table 4 above, the acceptance was more in demand by male respondents than female respondents.

Table 5. Characteristics of Respondents Based on Age

Age	Frequency	Percentage
19	10	10%
20	17	17%
21	59	59%
22	12	12%
23	2	2%
Total	100	100%

Based on the data in table 5 above, this test was carried out by most respondents who were 21 years old.

Table 6 Characteristics of Respondents Based on Experience in Using E-Learning

Experience	Frequency	Percentage
Yes	72	72%
No	28	28
Total	100	100%

By looking at table 6 above, the majority of respondents have experience in using e-learning other beside CeLOE LMS.

3.3. Descriptive Analysis

Measuring the mode of the distribution of answers from respondents to Performance Expectancy, it shows that on average the respondents agree on the questionnaire items in this variable. Based on the results of measuring the mode of the distribution of answers from respondents to Effort Expectancy, it shows that the average respondent agrees with the questionnaire items that are in this variable. Based on the results of measuring the mode of the distribution of answers from respondents to Social Influence, it shows that the average respondent is doubtful about the questionnaire items that are in this variable. Based on the results of measuring the mode of the respondent's distribution of answers to the Facilitating Condition, it shows that on average the respondents agree with the questionnaire items in this variable. Based on the results of measuring the mode of the distribution of answers from respondents to the Behavioral Intention, it shows that the average of respondents agrees with the

questionnaire items in this variable. Based on the results of measuring the mode of the distribution of answers from the respondents to the Use Behavior, it shows that on average the respondents agree with the questionnaire items in these variables. Based on the results of measuring the distribution of answers from respondents to all items, it shows that the average respondent agrees with all the questionnaire items in this variable.

3.4. Validity and Reliability

In this research, re-tested was carried out for the validity of the questionnaire items using a significant level of 5% with 100 respondents. These items were tested using IBM SPSS Statistics 26 software. From the Product Moment r Value Table written in Sugiyono's book, the r table value was 0.202 [15]. The following is a table of 5 summaries of the results of the validity test totaling 25 questions with 100 respondents in this research.

Table 7. Validity Test

Item	Pearson Value	R-Table Value	Information
VU1	0.516	0.202	VALID
PE1	0.660	0.202	VALID
PE3	0.698	0.202	VALID
PE4	0.354	0.202	VALID
PE6	0.665	0.202	VALID
PE7	0.643	0.202	VALID
PE8	0.696	0.202	VALID
EE1	0.405	0.202	VALID
EE2	0.365	0.202	VALID
EE3	0.524	0.202	VALID
EE5	0.413	0.202	VALID
SI2	0.270	0.202	VALID
SI3	0.569	0.202	VALID
SI4	0.715	0.202	VALID
SI5	0.485	0.202	VALID
SI6	0.646	0.202	VALID
SI7	0.701	0.202	VALID
FC1	0.603	0.202	VALID
FC2	0.556	0.202	VALID
FC3	0.670	0.202	VALID
FC4	0.451	0.202	VALID
FC5	0.562	0.202	VALID
FC6	0.695	0.202	VALID
BI1	0.712	0.202	VALID
UB1	0.537	0.202	VALID
UB2	0.212	0.202	VALID

Based on table 7, it is known that all 25 variables are declared valid because they have a Pearson correlation value above the r table value.

In processing data for reliability testing using IBM SPSS Statistics 26 software with 100 respondents, the results are presented in table 8 with the following results.

Table 8. Reliability Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.906	100

Referring to table 8 above, it is known that the Cronbach's alpha value of all statement item variables has a value above 0.80 or to be precise 0.906 so that the reliability of all statement item variables in this reserach can be declared good.

3.5. Classic Assumption Test

The classic assumption test was carried out for this research. The classical assumption tests used in this research were: Normality Test, Multicollinearity Test, and Heteroscedasticity Test.

The normality test was carried out using the Kolomogorov-Smirnov. The following table 9 is the result of the normality test that has been carried out using SPSS:

Table 9. Normality Test

One-Sample Kolmogorov-Smirnov Test	
Asymp. Sig. (2-tailed)	0.200

The results of the normality based on table 9 above test using the Kolomogorov-Smirnov show a significance result (Asymp.sig) greater than 0.05, so it can be concluded that the data in this research were normally distributed.

Then for multicollinearity test, table 10 is the result of the multicollinearity test that has been carried out using SPSS:

Table 10. Multicollinearity Test

Coefficients^a		
Independent	Dependent	Sig.
X1	Y1	0.000
X2		0.926
X3		0.891
X4		0.003

Based on the information within the table above, the four independent variables have a significance value (Sig.) Of less than 1. So that it can be concluded that the multicollinearity test conducted shows significant results, there was no correlation between independent variables, and there was no multicollinearity symptoms.

For the heteroscedasticity, test was carried out using the Glejser test. The following table 11 is the result of the normality test that has been carried out using SPSS:

Table 11. Heteroscedastisity Test

Coefficients ^a		
Independent	Dependent	Sig.
X1	Abs_RES	0.776
X2		0.218
X3		0.221
X4		0.246

Based on the data within the table above, it can be seen that the significance value (Sig.) of the four independent variables is greater than 0.05. So it can be concluded that the heteroscedasticity test that was carried out did not show an indication of heteroscedasticity.

3.6. Determination Coefficient Test

The coefficient of determination test was carried out on the variables with and without moderation which are described in the following table.

Table 12. Determination Coefficient

Variable Relationship	Moderating Variable	Effect of Addition	Total Effect
PE → BI	-	-	40,8%
	Gender	1,9%	42,7%
	Age	0,1%	40,9%
EE → BI	-	-	21,2%
	Gender	2,6%	23,8%
	Age	0,5%	21,7%
	Experience	2%	23,2%
SC → BI	-	-	20,4%
	Gender	4,3%	24,7%
	Age	2,2%	22,6%
	Experience	6,6%	27%
	Voluntariness of Use	14%	34,4%
FC → UB	-	-	10%
	Age	2,6%	12,6%
	Experience	4,8%	14,8%
BI → UB	-	-	12,8%

The calculation of the coefficient of determination test shows that all variables have a positive effect on the variables they influence. Then after adding the moderation variable, it also produces all moderation variables which are proven to strengthen their own relationship. Then

the highest effect was achieved from testing the Performance Expectancy variable on Behavioral Intention. This means that average students believe using CeLOE LMS will help them increase productivity in the study process. As for the lowest score obtained from testing the Facilitating Conditions variable on Use of Behavior. This means that students believe that there was still a lack of influence from the organizational infrastructure and technical infrastructure to support the use of CeLOE LMS.

3.7. Hypotheses Test

This hypothesis testing is carried out on hypotheses do and do not contain moderator variables.

The following table 13 is the result of hypothesis testing which does not contain moderator variables using the t-statistic test.

Table 13. Hypotheses Test I

Code	Variable Relationship	t-Statistics	t-Table	Decision
H1	PE → BI	8,222	1,66	Positive and Significant
H2	EE → BI	5,127	1,66	Positive and Significant
H3	SC → BI	5,015	1,66	Positive and Significant
H4	FC → UB	3,292	1,66	Positive and Significant
H5	BI → UB	3,795	1,66	Positive and Significant

The outcomes after testing was obtained that all t-Statistics > t-Table. So, it can be concluded that the hypotheses H1, H2, H3, H4, and H5 can be stated as positive and significant.

The following table 14 is the result of hypothesis testing which contain moderator variables using the F test.

Table 14 .Hypotheses Test II

Code	Variable Relationship	Moderating Variable	F Anova	Decision
H1a	PE → BI	Gender	23,834	Accepted
H1b		Age	22,110	Accepted
H2a	EE → BI	Gender	9,984	Accepted
H2b		Age	8,893	Accepted
H2c		Experience	9,686	Accepted
H3a	SC → BI	Gender	10,490	Accepted

Code	Variable Relationship	Moderating Variable	F Anova	Decision
H3b		Age	10,490	Accepted
H3c		Experience	11,808	Accepted
H3d		Voluntariness of Use	16,805	Accepted
H4a	FC → UB	Age	6,196	Accepted
H4b		Experience	5,579	Accepted

The hypothesis test that containing moderator variables was obtained that F-Anova > F-table. Thus, it can be concluded that the hypotheses H1a, H1b, H2a, H2b, H2c, H3a, H3b, H3c, H3d, H4a, and H4b can be declared accepted.

This means that using E-learning CeLOE LMS can help improve student performance in the lecture process. The use of this technology can also mean that the ease associated with using E-Learning CeLOE LMS has generated interest from users to use CeLOE LMS in helping students in the lecture process. In addition, some lecturers have also introduced CeLOE LMS as a center for collecting assignments carried out by Telkom University students. CeLOE LMS has also tried to support facilities in its use and this is also supported by regular maintenance activities to maintain or improve CeLOE LMS services, but the impact is less felt by the average student. For the final, students have the awareness to proceed using CeLOE LMS in the study process.

4. CONCLUSION

Based on the results of the rese, the level of acceptance of the use of CeLOE LMS can be concluded that the average respondent agrees with all questionnaire items. This shows that CeLOE LMS at Telkom University has been accepted and used by Telkom University students.

The variable that has the greatest influence is Performance Expectancy with its effect on Behavior-al Intention and the lowest is Facilitating Conditions with its effect on Use Behavior. The variables Gender, Age, Experience, and Voluntariness of Use strengthen all their own relationships. The variable that has the greatest influence in strengthening is the Voluntariness of Use in strengthening the relationship between Social Influence and Behavioral Intention and the lowest in strengthening is the Age variable in strengthening the relationship between Performance Expectancy and Behavioral Intention.

5. SUGGESTION

The recommendations for improvement given was based on the result of Facilitating Conditions as the one that has lowest impact to the CeLOE LMS. The solutions are to increase the socialization of the use of the CeLOE LMS, improve the organizational infrastructure of the CeLOE LMS, and improve the technical infrastructure of the CeLOE LMS.

For further research, it can be continued with other subjects, such as Telkom University Lecturers or else. Then the analysis can be tested with other approaches to get various perspectives on the behavior of using technology.

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