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Application of Technology Acceptance Model to E-learning Assessment (Kelase) in Agricultural Technology Education, Universitas Negeri Makassar

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Abstract. Kelase is an E-learning program that has been applied in the Agricultural Technology Education (PTP), especially in the Toxicology and Food Safety courses. This study aims to analyze application and acceptance of PTP students to Kelase, as well as variable correlation and linearity used in the Technology Accepted Model (TAM) method. The independent variables in this study consisted of variables perceived ease of use and perceived usefulness, while the observation variable was acceptance. Techniques for collecting data through giving questionnaires. The questionnaire instrument was tested for its validity and reliability. Data measurement scale uses Likert scale. Data processing uses IBM SPSS 20.0 software. The results show that level of perception of PTP student admissions is very high, which is between 70.1-91%. The correlation of TAM variable is significant and positive. Both variables, perceived ease of use (X1) and perceived usefulness (X2), are very influential on acceptance (Y) and both of these variables simultaneously influence the level of student acceptance of Kelase. The regression determination coefficient is generated, which is 52%. These results indicate that the influence of variables perceived ease of use (X1) and perceived usefulness (X2) is only 52%, and the rest, which is 48% influenced by other variables.

1. Introduction

E-learning is learning method that utilizes information and communication technology through internet facilities and websites, so that learning process can still occur at anywhere. E-learning that began to be applied in PTP was Kelase. Kelase comes from Javanese language, with class basic words. Class is a room in school that is used for teaching and learning activities, where teachers and students interact with each other. The suffix 'e' behind the class means 'nya' in Indonesian, so Kelase is same as class [1]. Toxicology and Food Safety course is one of courses that has implemented Kelase program. Kelase considered to meet criteria in E-learning system. [2] have developed E-learning Kelase for Microbiology course, results show that Kelase program is valid and feasible to be applied because it has features that meet E-learning quality standard criteria, namely intensity of lecturer meetings students, and other students, online discussions, assignments, examinations, and value management. Therefore, research about analysis of application and acceptance of PTP students to Kelase needs to be studied.

Technology Acceptance Model (TAM) is one of the analytical techniques that can be used to test level of acceptance. [3] TAM can be approach to understanding user attitudes towards technology by defining several factors that influence user acceptance of technology, namely perceived ease of use, perceived usefulness, attitude toward using, behavioral intention to use, and actual system usage. This research will be explain feasibility or inability of Kelase utilization in the Toxicology and Food Safety



courses taught at PTP. Purpose of this research was to analysis level of acceptance of PTP students on Kelase using TAM and find out the correlation and linearity between variables in TAM.

2. Research Methods

2.1 Research Approach

This research uses Technology Acceptance Model (TAM) approach. TAM used to measure extent of student acceptance of Kelase. In its development, TAM model experienced various modifications. Therefore, this study will use the TAM model that has been developed by [4] which consists of three variables, namely perceived ease of use, perceived usefulness, and acceptance.

2.2 Samples

Samples are part of number and characteristics of the population [5]. The sample in this research was taken by accidental sampling, namely students of Agricultural Technology Education Department, Faculty of Engineering, Makassar State University, who were taking Kelase based courses in Even semester 2017/2018, especially students who took Toxicology and Food Safety course.

2.3 Research Variables

Operational variables are statements in special form and are criteria that can be tested empirically [6]. Research variable consisted of independent variables and dependent variables. Dependent variables are variables that want to be explained based on other variables, while independent variables are variables that cause changes in the dependent variable [7]. Independent variable of this study is perceived ease of use and perceived usefulness, while dependent variable is acceptance.

2.4 Data Collection Techniques

Data in this research were collected through a questionnaire. Questionnaire is collection of data through list of questions filled in by the respondents themselves [6]. Measurement scale of data in questionnaire uses Likert scale. Likert scale is measurement used to measure attitudes, opinions, and perceptions of person or group of people about social phenomena [6]. With Likert scale item, variables to be measured are translated into sub-variables. For quantitative analysis, answers are given score, namely strongly agree (5), agree (4), doubt (3), disagree (2), and strongly disagree (1).

2.5 Validity and Reliability of Instruments

Validity test is used to measure extent to which measuring instruments used in study are in accordance with the research objectives [8]. Measuring instrument can be said valid if it is able to show extent to which it accuracy [9]. Reliability test is used to express internal stability of the respondent's answers in one variable. This is done to determine extent which measurements can produce results that are not different (consistent), if done again on same subject [8].

2.6 Data Analysis

Data processing and image making is done using Microsoft Excel 2013 software. Descriptive analysis, analysis of validity, reliability, and multiple linear analysis are processed using IBM SPSS 20.0 software.

3. Results and Discussion

3.1 Description of Respondents

Respondents, who were objects in this study, were students in the Agricultural Technology Education (PTP) Department, Faculty of Engineering, Universitas Negeri Makassar, who took courses in the Even semester 2017-2018, specifically Toxicology and Food Safety. Number of respondents involved in this research were 67 people, consisting of 20 (29.85%) men and 47 (70.15%) women.

3.2 Analysis of Acceptance Level of Kelase in Agricultural Technology Education (PTP) Department

Variables used to measure factors that influence level of student acceptance in PTP Department on Kelase consist of 2 variables. These variables include perceived easy of use and perceived usefulness

that are associated with PTP students' acceptance of Kelase. Each indicator is divided into several sub-indicators. All sub-indicator statements will be tested for their validity and reliability. Therefore, data used in designing multiple linear regression models between influence of variable indicators and PTP student acceptance is only valid and reliable data.

All variables used are valid, namely variables perceived easy of use, perceived usefulness, and acceptance (Table 1). All sub-indicators used in variables are valid and reliable. This result is indicated by the value of Kaiser-Meyer-Olkin Measure of Sampling Equity (KMO MSA) on all variables ranging from 0.681-0.817 with the factor loading value of each sub-indicator starting from 0.621-0.841. This value further explains that this variable is valid. According to [10] the questionnaire instrument was declared valid if it had a KMO MSA value of ≥ 0.5 and a loading factor of ≥ 0.7 , but a factor loading value of 0.5-0.6 was still acceptable.

Table 1. Frequency and percentage of respondents against variable technology acceptance model (TAM)

Variable TAM	Likert Scale (Frequency, Percentage)					Average	KMO	Factor Loading	Cronbach's Alpha
	1	2	3	4	5				
Perceived ease of use									
Easy to learn	0	0	12 (17.9%)	50 (74.6%)	5 (7.5%)	3.89	0.681	0.708	0.797
Easy to use	0	0	11 (16.4%)	42 (62.7%)	14 (20.9%)	4.04		0.742	0.816
Clear and easy to know	0	0	20 (29.9%)	39 (58.2%)	8 (11.9%)	3.82		0.808	0.752
Easy to understand	0	0	17 (25.4%)	40 (59.7%)	10 (14.9%)	3.89		0.776	0.773
Perceived Usefulness									
Speed up work	0	0	18 (26.9%)	36 (53.7%)	13 (19.4%)	3.92	0.817	0.746	0.762
Increase effectiveness	0	0	15 (22.4%)	41 (61.2%)	11 (16.4%)	3.94		0.841	0.742
Simplify work	0	1 (1.5%)	10 (14.9%)	41 (61.2%)	15 (22.4%)	4.04		0.718	0.766
Helpful	0	0	6 (9.0%)	40 (59.7%)	21 (31.3%)	4.22		0.716	0.825
Acceptance									
Good idea	0	0	3 (4.5%)	51 (76.1%)	13 (19.4%)	4.14	0.801	0.739	0.719
User satisfaction	0	0	24 (35.8%)	38 (56.7%)	5 (7.5%)	3.71		0.808	0.713
Use more	0	0	21 (31.3%)	42 (62.7%)	4 (6.0%)	3.74		0.734	0.675
Recommend other users	0	0	15 (22.4%)	37 (55.2%)	15 (22.4%)	4		0.621	0.726

Indicators used in the measurement of all variables are also reliable. This can be seen in Cronbach's Alpha value generated by each sub-indicator in this variable greater than 0.70 (> 0.70). Cronbach's Alpha value for each sub indicator ranges from 0.675-0.825. Variable is declared reliable if it produces Cronbach's Alpha > 0.70 , even though value of 0.60-0.70 is still acceptable [10].

3.3 Description of Perceived Easy of Use

Average value of each sub-indicator is in range of 3.82-4.04, this range indicates that PTP students agree to statements given on each sub-indicator. Generally, PTP students who gave agree response was in range of 39-50 people (58.2-74.6%), even some PTP students stated that strongly agreed with the statements on each sub indicator of this variable. Number of PTP students who stated strongly agree was in range of 5 (7.5%) to 14 people (20.9%). These results indicate that students agree that

Kelase program is one of E-learning programs that is easy to learn, easy to use, clear and easy to know, and easy to understand.

Students of PTP agree that Kelase program is clear and easy to know. Kelase program is also very easy to find for PTP students. This is because UNM has its own network in Kelase, so Kelase program can be opened on the official UNM website, which is on the website <http://www.kelase.net/institusi/23927-University-Negeri-Makassar>.

Kelase account can be made by each PTP student causes Kelase use to be only controlled properly by each user, especially for students. According to [11], Kelase is private social network as well as online learning environment for educational institutions and organizations. Kelase is flexible, because this program is available on the android application, so that its use can be done at time and place outside formal lecture hours (face to face). Kelase is LMS-based E-learning and has interesting devices that can be accessed mobile and provide variety of interesting features like social media [12].

Students agree that Kelase program is easy to learn, easy to use, and easy to understand. This assessment is response of students to menus provided by Kelase. Kelase is equipped with Lesson Planner feature that makes it easy for educators to arrange learning activities, as well as Taxonomy Toolbox feature that can help educators in compiling learning objectives [13]. In addition to social networking functions, Kelase is also focus for supporting learning and training activities in institutions (organizations) by providing online class features which include teaching materials, discussion forums, assignments, and quizzes [11].

There is also doubtful of PTP students on this variable. Some students (range 11-20 people, 16.4-29.9%) still give doubtful assessment of Kelase program because "Beta Kelase" program available on android is sometimes difficult to open. In addition, complaints were also caused by the fact that Kelase program adverts were quite large. It disturbed students who were logged in program, especially if logged in via cellphone.

3.4 Description of Perceived Usefulness

Average value of each sub-indicator in perceived usefulness ranges from 3.92-4.22. This value indicates that students agree with statement on each sub-indicator. PTP students assess Kelase can speed up, simplify work, and increase effectiveness. Kelase is considered capable of improving learning system at PTP. Kelase is one of facilities that can be used by the teaching team to attach and explain materials that have not been mastered and understood by students. Therefore, students can more freely interact and ask questions outside of lectures on matters relating to lectures, including obtaining teaching materials and supporting materials, explanation of lecture materials that have not been understood directly from lecturer concerned, conformity and consultation about theme of assignment given, and task to be collected. This whole process makes it easier for students to understand the material, know what to do, and have good self-confidence. All of these factors indirectly affect effectiveness and work done by students

Students of PTP, ranging from 6-18 people (9.0-26.9%), assess Kelase with expressions of doubt. This assessment is considered something reasonable, because some students still consider that E-learning applied in PTP is quite different from previous or existing E-learning system. Students consider E-learning to be only one of tools in learning process that can be used as lecture process online (without face to face) and as substitute schedule if one of team of lecturers cannot enter. E-learning method at PTP is not used as means to replace lecturers' teaching schedules, although this may, even can be done, and does not violate existing regulations. However, E-learning process that wants to be applied in the course of the lecture is only used as means to explain lecture material outside of lecture hours, as place of communication between lecturers and students on lecture material that has not been understood by students, as forum to provide lecture teaching materials to students, as well as consultations on themes and assignment references that will be made by each student.

Kelase program implemented in PTP Department was considered very useful by students. This is indicated by assessment of PTP students on beneficial sub-indicators that get the highest score compared to other sub-indicators in this variable, which are 21 people (31.3%). These results show that Kelase program can be used as E-learning program that can applied in PTP Department.

3.5 Description of Acceptance

Results analysis of acceptance variables show that PTP students receive Kelase application well to be used as means of E-learning. Student assessment is in the range of 3.71-4.14, this value shows acceptance of PTP students in agree category. PTP students agree that Kelase is considered necessary to be used and is good idea to be applied in learning process. Students who agree that Kelase is good idea, as many as 51 people (76.1%). Students consider Kelase to be fun program due to features found in Kelase designed like social media, which looks very different from available E-learning applications. Students can interact with other students in semi-formal conditions, similar to interactions in other social network accounts. In addition, Kelase application has also been provided in android (Beta Kelase), so that Kelase utilization for students is easier and can be used at any time.

The sub-indicator of user satisfaction and using more of the majority is also worth agreeing. However, students who gave a doubtful grade were also quite high, which was second only to votes included in the agreed category. Students who give doubtful grades range from 3-24 people or 4.5-35.8%. Application using laptop are preferred compared via Android phone. This is mainly due to large number of ads available when Kelase application is opened via Android cellphone. In addition, if Kelase program is opened using Android phone, some Android phones have not been able to connect properly. Kelase application program is still quite heavy for certain Android phones when used, so it sometimes causes cellphone to slow down and suddenly stop. The results of this assessment can be reference for beta kelase application developers on Android phones so that application programs become better.

Students of PTP recommend Kelase program as good E-learning program. Total number of PTP student evaluations, both those who agree and strongly agree, are 52 people (77.6%). These results indicate that although Kelase program still has shortcomings that need to be improved, this program is feasible and meets standards of the E-learning program. E-learning planning is integral part of institutional strategic planning efforts. The implementation of E-learning based courses must ensure the five competencies of E-learning [14].

3.6 Correlation and Linearity Between Variables and PTP Student Acceptance Levels on Kelase

Regression equations can consist of one independent variable and one dependent variable or several independent variables with one dependent variable [15]. Multiple regression analysis is regression analysis technique that can be used to test effect of several independent variables on one dependent variable [10]. In this research, independent variables consist of perceived ease of use (X1) and perceived usefulness (X2). Dependent variable is acceptance (Y).

3.6.1 Testing of Classical Assumptions

Classical assumption testing is test of linear regression assumptions that aim to avoid appearance of bias in data analysis and to avoid errors in regression model specifications used. Classical assumption testing consists of normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test [10].

Normality test

Normality test aims to determine whether data residuals from linear regression model have normal distribution or not. Results of One-Sample Kolmogorov-Smirnov test that are produced show asymp value. Sig. (2-tailed) 0.542 > 0.05. This result also shows that data obtained is normally distributed.

Multicollinearity Test

Multicollinearity test aims to determine whether or not there is correlation between independent variables in regression model. Method that can be used to test nature of multicollinearity is to see tolerance and VIF (Variance Inflation Factor) value produced. Tolerance value for perceived ease of use variables and usefulness perceptions, namely 0.7. Overall value of tolerance produced by both variables is greater than 0.10 (> 0.10). VIF values of two variables, both perceived ease of use and

perceived usefulness, were 1,429. VIF values generated by each variable are smaller than 10 (<10). Tolerance values (> 0.10) and VIF values (<10) indicate that data does not have problems with multicollinearity and meets the requirements of multicollinearity testing. According to [10] recommended value for showing no multicollinearity problem is that tolerance values must be > 0.10 and VIF values <10 .

Autocorrelation Test

Autocorrelation test aims to determine whether there is correlation between confounding errors in observation data, one observation to another observation in linear regression model. Good regression model is that there is no correlation. One method of autocorrelation testing is Durbin-Watson (DW) statistical test, which compares results of DW statistic with DW tables. Results obtained show DW statistic value is 1.971. Table DW value is obtained from Durbin-Watson table. There are two variables used ($k = 2$) with samples ($n = 67 \approx 70$). DW value of table at level of 5% resulting from this combination is lower limit (1.554) and upper limit (1.672). DW value of statistics is greater than DW value of the table ($1.971 > 1.672$). These results indicate that there is no autocorrelation relationship, meaning autocorrelation coefficient is zero or there is no autocorrelation.

Heteroscedasticity Test

Heteroscedasticity test aims to determine whether variance of residual data from one observation to another observation is different or fixed. If variance of same, data residue is called homokedasticity and if it is different, it's called heteroscedasticity. Glejser test shows significance value for perceived ease of use variable, namely 0.913, and usefulness perception variable, worth 0.894. Significance value of these two variables is greater than 0.05 (> 0.05), meaning that these two variables meet heteroscedasticity test. Therefore, both variables can be used in multiple linear regression models. Both of these variables meet classical assumption test (normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test).

3.6.2. Model Feasibility Testing

Feasibility testing of multiple linear regression models can be done by doing some testing. Tests carried out include testing reliability of model (F test), testing regression coefficient (t test), and testing coefficient of determination.

Determination Coefficient Test

Adjusted R square value, which is 0.520. This value indicates that proportion of variables perceived ease of use and perceived usefulness towards acceptance variable is 52%. That is, effect of perception variables ease of use and usefulness perceptions of revenue are only 52%, while remaining 48% are influenced by other variables not contained in linear regression model.

Model Reliability Test (F Test)

Reliability test (F test) aims to find out whether all independent variables included in regression model have effect simultaneously (together) on dependent variable or not. The F test results show F value is 36,776. Significance value is $0 < 0.05$. These results indicate that all independent variables (perceived ease of use variables and usefulness perceptions) simultaneously have significant effect on the dependent variable, namely acceptance. These results indicate that multiple linear regression model that is estimated to be feasible is used to explain effect of perceived ease of use and perceived usefulness on acceptance variable.

Regression Coefficient Test (t Test)

Regression coefficient test (t test) aims to know individually influence of one independent variable on dependent variable. Regression coefficient test results (t test) can be seen in Table 2.

Table 2.Regression coefficient test results (t test)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.975	1.374		2.892	.005
	Perceived Ease of Use (X1)	.324	.093	.353	3.464	.001
	Perceived Usefulness (X2)	.407	.087	.476	4.665	.000

a. Dependent Variable: Acceptance (Y)

Regression coefficient test results (t test) shows value of t generated by variable perceived ease of use, which is 3.464 with a significance value of 0.001. Likewise, in variable usefulness perception, value of t produced is 4.665 with significance value of 0. Significance value of variable perceived ease of use and perceived usefulness is smaller than 0.05 ($0 < 0.05$). These results indicate that partially these two variables have significant effect on acceptance variable.

Interpretation of Multiple Linear Regression Models

Model interpretation is carried out after classic assumption test and model feasibility test. This is done so that there is no error in fulfilling assumption. In addition, feasibility of model to be estimated is to explain independent variables used. Equation of multiple linear regression model produced is:

$$Y = 3.975 + 0.324 x_1 + 0.407 x_2 + e$$

Regression equation model shows variables of perceived ease of use (X1) and perception of usefulness (X2) is positive. Multiple linear regression equation obtained explains that better perceived ease of use felt by students in PTP Department and higher perceptions of usefulness of Kelase application, student acceptance in PTP Department will increase. Likewise, if perceived ease of use variable is not maintained (decreases) and usefulness perception variable is also low, then student acceptance in PTP Department will also be lower.

4. Conclusion

Conclusion of results this research is that Kelase application is one of E-learning programs that can be accepted by students of Agricultural Technology Education Program (PTP) with very high level of acceptance, which ranges between 70.1-91%. PTP student acceptance rates are influenced by perceived ease of use variables and usefulness perception variables. Variable Technology Acceptance Model (TAM) has significant correlation. Each variable, both perceived ease of use, usefulness perception, and acceptance influence each other. Effect of variable perceptions of ease of use and usefulness perception on acceptance, namely 52%. Regression equation model shows variables of perceived ease of use (X1) and perception of usefulness (X2) is positive.

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