

Measuring The Success of E-Learning In Universities Using The Technology Acceptance Model

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Abstract—This study aims to determine the factors of acceptance of e-learning technology in students who use the technology acceptance model, namely perceived usefulness (PU), perceived ease of use (PEOU), an attitude of acceptance of use (ATU), and acceptance (IT) of the e-learning acceptance system. The population in this study were students of state Islamic religious institutes who had participated in the e-learning system. The respondents of this study were students of the Ambon State Islamic Institute of Religion, which collected 30 respondents. The method used in this study uses the technology acceptance model method in the process of data processing using quantitative analysis techniques in the process of analyzing data from research results. The analysis results show that the acceptance of e-learning technology by students of the Islamic Institute of Religion is very well received by users of the Ambon State Islamic Institute of Religion students. The study's results showed that the variable utilization percentage of 76.66% was stated to agree strongly. In comparison, the percentage of 61.66% agreed. Attitudes towards users 70.66% agreed. The study's results show that students in the learning process can accept using e-learning systems.

Keywords—Measuring; Success; E-Learning; TAM

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I. INTRODUCTION

The development of learning from year to year has undergone significant changes. Conventional learning, better known as face-to-face learning in the classroom between educators and students, is still less effective [1]. From the existing problems, it is necessary to measure the success of the implementation of e-learning which can increase the effectiveness of the process. Learning, in this case, between educators and students in the learning process is only done conventionally [2]. To overcome this problem, it is necessary to have an e-learning-based learning system, namely creative learning in the teaching and learning process between educators and students by utilizing internet facilities as a means of learning achievement [3]. Knowledge is generally used to maximize the learning process between educators and students. Based on the Decree of the Minister of National Education Number 107/U/2001 concerning the Implementation of Educational Programs, which is more popular with the name Open Distance Education, abbreviated as PTTJJ [4]. has been officially issued a learning system to be used as a learning process anywhere and anytime to overcome problems related to distance [5]. The utilization of technology in the learning process can provide benefits for improving the quality of learning and provide significant access to the world of education and training in reducing education costs and helping save expenses [6].

Similar studies measure e-learning success using a technology acceptance model. The primary purpose of this study is to find out how far the measure of e-learning success is; there are several obstacles among students who are not accustomed to using internet facilities, and there needs to be training for students in using internet facilities in the learning process. [7]. An in-depth study is required regarding the measurement of e-learning success from the aspect of e-learning success

Several studies conducted by previous researchers related to the success rate of e-learning in students by using the technology acceptance model method as an online learning medium; this research was conducted to assess the success of e-learning in the acceptance and application of e-learning [8]. They were learning as a form of teaching media. In educational institutions, in applying the technology acceptance model method. The sample in this study amounted to 60 students consisting of informatics engineering majors who have contributed to the learning process. This study showed that e-learning users in the learning process of informatics engineering students, seen from the perception of ease, greatly motivate users to use e-learning [9].

Similar research regarding the acceptance of e-learning by using the technology acceptance model approach to know the extent to which e-learning is used in the learning process; in the process of implementing the e-learning system, there are several difficulties for students because

they are not familiar with the use of e-learning [10]. So training is needed for students to use e-learning in the learning process. So it is necessary to observe more about the acceptance of the use of e-learning systems from the perspective of acceptance and use [11].

The use of e-learning systems needs to be done to familiarize students with using e-learning systems. This study aims to assess the extent of acceptance of the e-learning system using the technology acceptance model approach [12]. As well as familiarizing students with using e-learning, it requires an analysis of e-learning acceptance to see the extent to which student responses are related to e-learning system learning. The method used in this study is to use a technology acceptance model approach. The technology acceptance model is one method used to assess the extent to which a person accepts the use of e-learning systems [13].

II. RESEARCH METHOD

The method used in this study uses a quantitative approach. This is quantitative research. A sample population study was conducted to calculate end-user responses to the success of e-learning using the technology acceptance model at the Ambon State Islamic Institute [14]. Descriptive research was conducted to collect data, first a questionnaire or then continued with interviews with students or respondents.

The technology acceptance model (TAM) is designed for users of information systems. The technology acceptance model (TAM) aims to measure the extent to which an individual accepts and trusts an information technology. The technology acceptance model is considered to have two beliefs that the main behavioral variables improve information systems, including user perceptions of use [15]. Perceived user files can be interpreted as a means for someone to believe that using a specific method can stabilize and improve one's performance. Perceived ease of use can be construed as someone considering that using a system does not require effort. The concept of the technology acceptance model develops theory as a guide in studying and understanding user attitudes to accept the use of information systems [16]. The idea of the technology acceptance model is believed to be seen from the aspect of personal acceptance of technology to provide information and motivate someone. The technology acceptance model contains several constructs, user convenience (perceived use of use) and user benefits (perceived used fullness) from individuals who use technology: behavior, the individual's desire to perform specific actions [17].

The technology acceptance model contains several constructs, user convenience (perceived use of use) and user benefits (perceived used fullness) from individuals who use technology. Behavior is an individual's desire to perform specific actions—the perceived usefulness (perceived ease of use). Technology users have behavioral intentions, but not the other way

around [18]. Technology users have a behavioral choice to use the system technology, which is valuable and accessible. The technology acceptance model is in Figure 1.

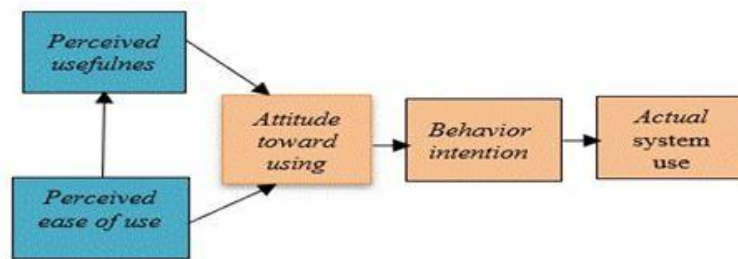


Figure 1. RESEARCH MODEL FRAMEWORK

Based on Figure 1. the framework of the Technology acceptance model (TAM) research model is divided into several parts, including perceived usefulness (PU); perceived usefulness is where a person believes that technology users can provide benefits to users, perceived ease of use (PEOU) is the perception of ease where someone believes that the use of technology in implementing computers well and efficiently so that it can be understood by users, attitudes towards use (ATU) attitudes towards system users in accepting technology in their environment. Work, behavior intention (ITU) behavioral sense where someone believes that computer technology can support someone. In facilitating the use of a technology, actual system use (ASU) is where someone believes that using a system can improve a person's performance [19].

This study uses descriptive and Likert scale analysis to determine variables using a technology acceptance model. Distributing questionnaires or questionnaires to respondents from the Tarbiyah faculty of the Ambon State Islamic Institute [20]. Statement questionnaires or questionnaires have been given to student and female respondents; as many as 30 respondents were targeted in the study, classified by gender in table 1.

Table 1. CATEGORY OF RESPONDENTS BY GENDER

Categories of Respondents Based on Gender		
Gender of	Respondents	Percentage
Male	13	43%
Women	17	57%
Amount	30	100%

Table 1 above shows that the overall results of the male gender questionnaire are 13 people with a percentage of 43%. 43% result is obtained from $100/30 \times 13$ —17 female participants with 57%. The mark 57 is obtained from $100/30 \times 17$. It can be concluded that the female gender is very influential in filling out the questionnaire. [21]

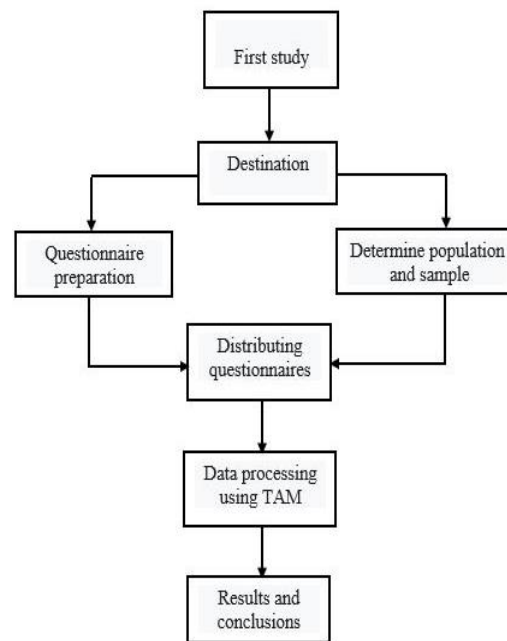


Figure 2. RESEARCH STAGES FRAMEWORK

The steps in this study are to determine the success of e-learning using the Acceptance technology model in Figure 2. Based on Figure 2. The framework of the research stages consists of several parts. The initial study is carried out for research preparation, then proceeds with the objectives, where the purposes are divided into two parts: the preparation of the questionnaire and the determination of the population and sample [22]. Then proceed with distributing questionnaires to the respondents; then the next step is data processing using the technology acceptance model (TAM) then the final stage is the conclusions and results.

III. RESULT AND DISCUSSION

The method used in this research is to use a quantitative approach by using a Likert scale type of research measurement to conduct evidence in research to find out how far the success of the acceptance of the e-learning tarbiyah system for students at IKIP Negeri Ambon. Stages of data collection using a Likert scale [23]. Using this scale makes it easier to assess the respondents' answers. The technique used in this research is if the respondent's answer chooses a value of 1 = strongly disagree, two disagree, three quite agree, four agree, and five strongly agree. The instrument can be a research questionnaire with a Likert scale of 1 = "strongly disagree." or two = "disagree." 3 = "fairly agree". 4 = "agree". 5 = "strongly agree". quantitative analysis techniques with stages.

Determine the value of the criteria score following the results obtained from the previous data processing—score or criterion value (SK). An excellent value has been received in the study; if it is assumed that all respondents are 200, then it is determined to choose the answer with the lowest score of 1 out of 1 question; the lowest value is 100. Assuming that all respondents are set to select the highest value of 5 out of 1 question, the highest value is 500. This highest value is called the criterion value. To get the criteria value using the formula:

SK = Highest score for each question x number of question items x number of respondents determines the total value of the data collection results obtained. The value of the sum of the effects of data collection is described as SH. The criteria for the SK value are the total value of the SH data collection obtained; the percentage is sought using the respondent's answers [24].

$$P = \frac{\sum SK}{\sum SH} \times 100\% \quad (1)$$

\sum SK Information :

- P = Percentage of Respondents' Answers
- \sum SK = Criteria Value
- \sum SH = Total Value of Data Collection Results

The next step is to determine the range of results based on the percentage criterion value obtained compared to the result value in table 2.

Table 2. RESPONDENTS ANSWERS CATEGORY

Of Respondent's Answers		
Percentage	Symbol	Description
0%-20%	SKS	disagree
21%-40%	KS	Don't agree
41%-60%	CS	Quite agree
61%-80%	S	Agree
81%-100%	SS	Strongly agree

Based on table 2 above is Based on table 3. There are several alternative answers, a value of 1 alternative explanation strongly disagrees (SKS), a matter of 2 alternative solutions disagree (KS), a value of 3 alternative answers quite agree (CS), a value of 4 alternative answers agree (S), and a score of 5 alternative solutions strongly agree (SS). The scale of each answer using a Likert scale is one of the scales used to measure a person's attitudes, opinions, and perceptions, the scale used is included in the five rankings in table 3.

Table 3. LIKERT SCALE

Likert Scale		
Symbol	Description	Score
SKS	Totally disagree	1
KS	Don't agree	2
CS	Quite agree	3
S	Agree	4
SS	Strongly agree	5

Based on table 3. There are several alternative answers, a value of 1 alternative explanation strongly disagrees (SKS), a matter of 2 alternative solutions disagree (KS), a value of 3 alternative answers quite agree (CS), a value of 4 alternative answers agree (S), and value of 5 alternative solutions strongly agree (SS).

Data Analysis

The general description of respondents who became the research object was determined by gender and the desire to experience using e-learning at the Ambon State Islamic Institute. Respondents based on the age of the end users of the e-learning system of the Ambon State Islamic Institute (IAIN Ambon), it can be seen that in the process of filling out the questionnaire in this study it was related to the e-learning system at the Ambon State Islamic Institute (IAIN Ambon). of the questionnaires that have been distributed to students and then analyzed based on age and gender where the age of 18-23 years as many as 27 people with a percentage of 90%. While the age of 24-28 years, as many as two people with a rate of 7%. While the age of 29-34, as many as one people with a percentage of 3%. Respondents based on experience using e-learning systems are seen by a rate based on age; respondents who have experience using e-learning systems are 28 participants with a percentage of 93%, while those who are not experienced in using e-learning systems with a rate of 7% can be seen that respondents who have experience in using the e-learning system are more influential as many as 28 participants from the 30 desired sample [25].

Description of Research Variables

The development of the technology acceptance model (TAM) method has four variables to measure the success of the questionnaire or questionnaire on the question variables as follows: The utilization variable consists of two statements; the distribution of the attitude variable can be seen based on the data collection results obtained in table 4.

Table 4. PERCEPTION OF USEFULNESS

Perception Of Usefulness					
Statement	Symbol				
Perception Of Benefit	SKS	KS	CS	S	SS
	1	2	3	4	5
More effective e-learning system From face-to-face e-learning	0	3	8	16	3
The e-learning system makes is the ease in the learning process	0	0	9	11	10

Based on table 4, the perception of usefulness above in the first statement for answers strongly disagree with as many as 0 people, answers disagree with as much as three people, answers quite agree with as many as eight people, answers agree with as many as 16 people, and answers strongly agree as many as three people. While the second statement, the answers strongly disagree with as many as 0 people, the answers disagree with as much as 0 people; the answers entirely agree with as many as nine people, the answers agree with as many as 11 people, the answers strongly agree as much as ten people [26]. Description of alternative explanations as follows:

Strongly disagree (SK) Disagree (SK) Sufficiently agree (CS) Agree (S) Strongly agree (SS)
 From the table above, the analysis can be done using a Likert scale for the behavioral variable categories in table 5.

Table 5. UTILIZATION VARIABLES

Utilization Variables		
Percentage	Symbol	Description
20%	SKS	Totally disagree
40%	KS	Don't agree
60%	CS	Quite agree
80% 76,66%	S	Agree
100%	SS	Strongly agree

Based on the range of categories in table 5 above, it can be seen that the distribution of the percentage of respondents' answers based on the utilization attitude variable is 76.66% agreed. From the results, it is said that respondents strongly agree that students and students have hopes of using the e-learning system in the lecture learning process in Figure 3.

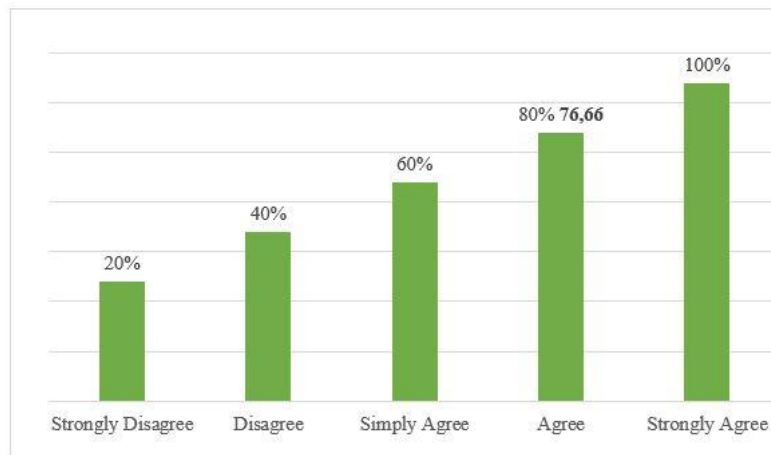


Figure 3. VARIABLES OF UTILIZATION

Based on Figure 3. Respondents' answers strongly disagree when seen from the picture above; the percentage of respondents 20% who choose the answer strongly disagree. Respondents' responses did not agree, the percentage of 40% who decided not to settle. Respondents' answers entirely agree on the rate of 60% who prefer the solutions entirely agree. Respondents' answers agree the percentage is 80% or the equivalent of 76.66%. Thus, the approved answers are very influential on the utilization variable, and the respondents' answers strongly agree at 100%.

Perception of ease of use consists of two questions. The following is the distribution table for the percentage of convenience based on the value of collecting questionnaires or questionnaires obtained in table 6.

Table 6. PERCEPTION OF USER CONVENIENCE

Consumer Convenience Perception					
Statement	Symbol				
Perception of convenience	SKS	KS	CS	S	SS
	1	2	3	4	5
Ease for me operate e-learning	2	10	9	8	1
Operate e-learning It is very eases to understand	0	4	15	9	2

Based on table 6, the user's perception above in the first statement for answers strongly disagree with as many as two people; answers disagree with as many as ten people, answers quite agree with as many as nine people, answers agree with as many as eight people, answers strongly

agree as much as one person. While the second statement strongly disagrees with 0 people, four people disagree, 15 people agree, nine agree, and two strongly agree [27].

Description of alternative answers as follows:

Strongly disagree (SK) Disagree (KS) Sufficiently agree (CS) Agree (S) Strongly agree (SS).

Then perform an analysis using the Likert model to obtain the desired variable; the categories can be seen in Table 7

Table 7. PERCEIVED EASE OF USE

Perceived Ease Of Use		
Percentage	Symbol	Description
20%	SKS	Totally disagree
40%	KS	Don't agree
60%	CS	Quite agree
80% 61,66%	S	Agree
100%	SS	Strongly agree

Based on the range of categories in table 7 above, seen from the perception of the ease of e-learning users, it can be concluded that from the distribution of the percentage of respondents' answers based on the attitude variable, the respondents' answers agree with a rate of 61.66% which is declared well accepted. The results showed that the respondents agreed that students had expectations to use the e-learning system, as shown in Figure 4.

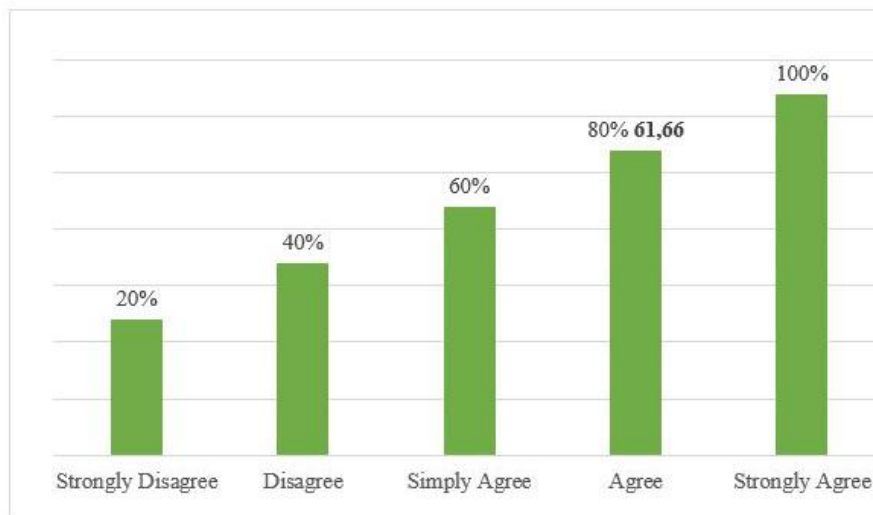


Figure 4. PERCEPTION OF USER FACILITY

Based on Figure 4. Users' perception of comfort for respondents' answers strongly disagree when seen from the picture above; the percentage of respondents' answers is 20% who choose the solutions strongly disagree. Respondents' responses did not agree. The rate of 40% who chose the

answer did not settle. Respondents' answers entirely agree with as much as 60% who decide pretty agree, and respondents' answers agree with as much as 80%. The percentage value of 61.66% is included in the blend with the category. The answers strongly agree as much as 100%. The lecture learning process can be seen in table 8.

Table 8. ATTITUDE TO E-LEARNING USERS

Attitude To E-Learning Users					
Statement	Symbol				
Attitude towards users	SKS	KS	CS	S	SS
	1	2	3	4	5
I like e-learning systems 0	6	11	10	3	
e-learning					
The use of e-learning is very suitable in the teaching and learning process	0	1	12	11	6

Based on table 8, attitudes toward e-learning users in the first statement, the answers strongly disagree with as many as 0 people, the answers disagree with as much as six people, the answers entirely agree with as many as three people, the answers agree as many as ten people, the answers strongly agree as much as three people. While the second statement strongly agrees with 0 people, one person disagrees, 12 people agree on enough, 11 agree, and six strongly agree [28]. Strongly disagree (SK) Disagree (KS) Sufficiently agree (CS) Agree (S) Strongly agree (SS). Next, an analysis is carried out using a Likert scale to obtain the desired category variable, which can be seen in table 9.

Table 9. ATTITUDE TOWARDS USERS

Attitude towards users		
Percentage	Symbol	Description
20%	SKS	Totally disagree
40%	KS	Don't agree
60%	CS	Quite agree
80% 70,66%	S	Agree
100%	SS	Strongly agree

Based on the range of categories in table 9 above, seen from the perception of attitudes towards e-learning users, it can be concluded that from the distribution results, the percentage of respondents' answers based on the desired variable is stated to be one with a rate of 70.66% expressing it is well received. The results show that respondents agree that students choose to use e-learning, as shown in Figure 5.

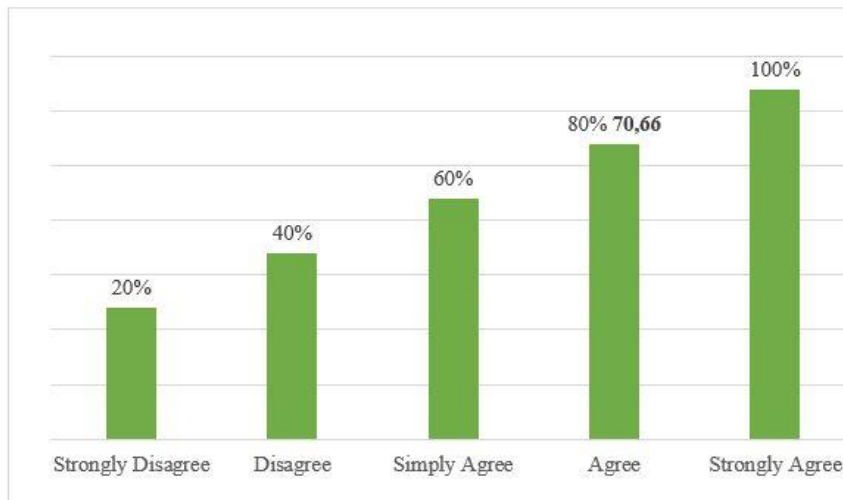


Figure 5. ATTITUDE TO USERS

Based on Figure 5. Attitudes toward e-learning users for respondents' answers are terrible if seen from the picture above; the percentage of respondents' answers is 20%, who choose significantly fewer solutions. Respondents' answers disagreed with the rate of 40% who chose the answer less agree as much as 60% who decided quite agree, the respondent's answer agreed as much as 80% or a percentage of 70.66% declared well accepted. The results showed that students have expectations to use e-learning. These results can be said that respondents agree to use e-learning in the lecture process in table 10.

Table 10. ACTUAL USER QUESTION

Actual User Question					
Statement	Symbol				
Actual user	SKS	KS	CS	S	SS
	1	2	3	4	5
I continue to use e-learning In the teaching and learning process	2	8	8	12	0
I often use it in the teaching And learning process	4	7	11	7	1

Based on table 10 statements from e-learning users for the first statement, two people strongly disagree, eight people disagree, eight people agree with enough, 12 agree with answers, and 0 strongly agree. While the second statement for answers strongly disagrees with as many as four people, answers disagree with as much as seven people, answers quite decide as many as 11

people, answers agree with as many as seven people, answers strongly agree with as much as one person [29].

Description of alternative answers as follows: Strongly disagree (SKS), Disagree (KS), Sufficiently agree (CS), Agree (S), Strongly agree (SS). Furthermore, a Liker scale was analyzed to obtain the categorical desire variable in table 11.

Table 11. ACTUAL USER QUESTION

Actual User Question		
Percentage	Symbol	Description
20%	SKS	Totally disagree
40%	KS	Don't agree
60%	CS	Quite agree
80% 66,75%	S	Agree
100%	SS	Strongly agree

Based on the range of categories in table 11 above, when viewed from the perception of e-learning user statements, it can be concluded that the results of the distribution of the percentage of respondents' answers based on the desired variable with the rate of respondents' answers of 66.75% are declared well accepted. The results showed that respondents agreed that students had a desire to use e-learning systems, as shown in Figure 6.

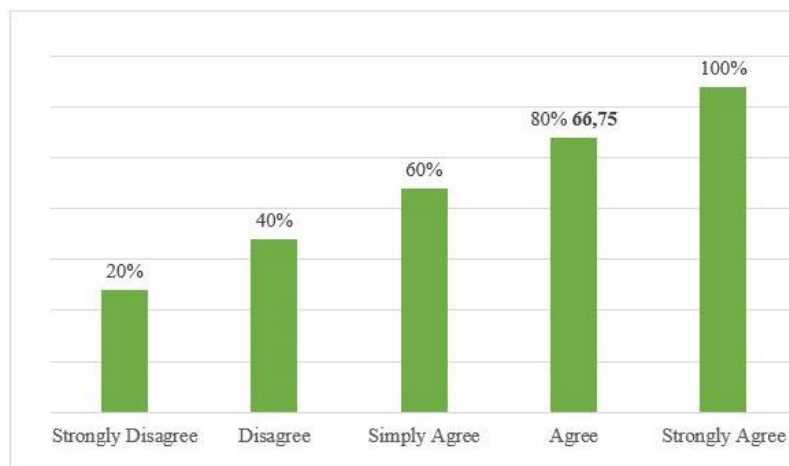


Figure 6. ACTUAL USER QUESTION

Based on Figure 6. User statements for respondents' answers strongly disagree when seen in the picture above the respondent's answers a percentage of 20% who chose the solutions strongly disagreed the rate of 40% who chose the answer to counter the respondent's response was entirely agreed by 60% who decided to settle at 80% with a percentage of 66.75%, strongly agree at 100%.

These results say that respondents agree with using e-learning in the lecture process. The overall results use the technology acceptance model to measure the success of using e-learning based on the variables that use the technology acceptance model in table 12.

Table 12. OVERALL TECHNOLOGY VARIABLE FREQUENCY DISTRIBUTION ACCEPTANCE MODEL

Comprehensive Variable Frequency Distribution Acceptance Model			
Description	Score	Respondent	Percentage%
Totally disagree	1	8	3
Don't agree	2	39	16
Quite agree	3	83	35
Agree	4	84	35
Strongly agree	5	26	11
Number		240	100
Number of research results		801	

Based on table 12, the frequency of technology variables, the overall acceptance distribution model for answers strongly disagrees with a percentage of 3% obtained from the calculation of $100/240 \times 8$. The answer disagrees with the rate of 16% obtained from the analysis of $100/240 \times 39$. The solution is entirely agreed upon; the percentage of 35% is obtained from the calculation of $100/240 \times 83$. The answer agrees the rate of 35% is obtained from the analysis of $100/240 \times 84$. The answer strongly agrees that the percentage of 11% is obtained from the calculation results of $100/240 \times 26$.

The next step is to analyze using a Likert scale with the overall variable categories in table 13.

Table 13. ENTIRE TECHNOLOGY VARIABLES ACCEPTANCE MODEL

Overall Variable Technology Acceptance Model		
Percentage	Symbol	Description
20%	SKS	Totally disagree
40%	KS	Don't agree
60%	CS	Quite agree
80% 66,75%	S	Agree
100%	SS	Strongly agree

Based on the range of categories in table 13 above, the overall e-learning acceptance variable from the research results above, it can be concluded that from the distribution of the percentage of respondents' answers based on the actual use variable, the respondents' answers with a rate of 66.75% are declared well accepted. [30]. The study results show that students have expectations of using the gender e-learning system, as shown in Figure 7.

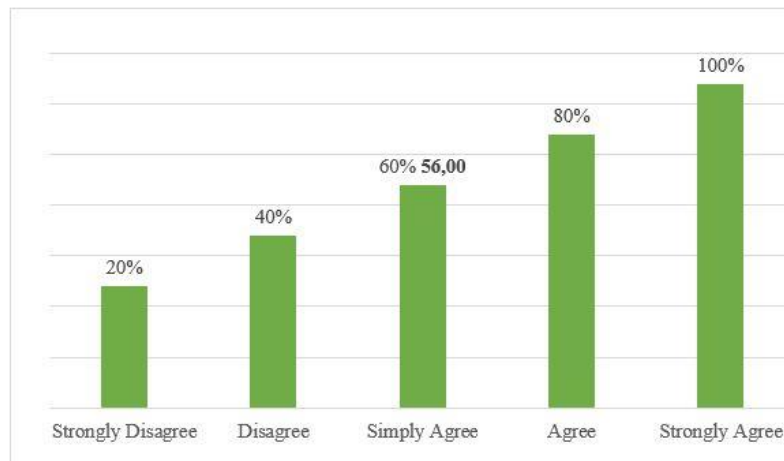


Figure 7. OVERALL TECHNOLOGY ACCEPTANCE MODEL VARIABLES

Based on Figure 7. Overall, the technology acceptance model variable, respondents' answers strongly disagree as seen from the picture above, the percentage of respondents' answers is 20% who choose the answer strongly disagree agree 40% who prefer the answer disagree enough agree 60% with a rate of 56.00 %, agree by 80%, and strongly agree by 100%. Then from these results, it can be concluded that students and students have hope in using e-learning in lectures [31].

IV. CONCLUSION

The analysis results show the acceptance of e-learning technology in students of the Ambon State Islamic Institute of Religion. The study results showed that the value of the variable utilization percentage of 76.66% stated strongly agree. In comparison, the perception of ease percentage of 61.66% said agreed. Attitudes towards users a rate of 70.66% agreed. The study results show that students can accept using e-learning systems to support the learning process.

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