

Analysis of the Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course: A Study on Students' Understanding and Acceptance of Technology at Universitas Islam Sumatera Utara

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Abstract: *This study analyses the implementation of the Technology Acceptance Model (TAM) in the Curriculum Review course among students of Universitas Islam Sumatera Utara. This study aims to identify the factors that influence students' acceptance and understanding of technology in the learning process. A quantitative approach was employed, utilising a structured survey distributed to 125 selected participants using the purposive sampling technique. The research instrument is a questionnaire developed based on TAM constructs, including (1) perceived usefulness, (2) perceived ease of use, and (3) attitude toward using. Data analysis employs Structural Equation Modelling (SEM)*

techniques to examine the relationships between variables. The research hypothesis examines the impact of perceived usefulness and perceived ease of use on attitudes and intentions to utilise technology in learning. The results show that: (1) perceived usefulness of technology among students positively affects attitudes toward using technology ($\beta=0.65, p<0.05$), (2) perceived ease of use of technology among students significantly positively affects attitudes toward using technology among students ($\beta=0.58, p<0.05$), (3) attitudes toward using technology among students significantly positively affect intentions to use technology among students ($\beta=0.72, p<0.05$). The TAM model is proven to explain 68% of the variance in technology acceptance among students. This suggests that the understanding and acceptance of technology among students in the Curriculum Review course are influenced by the perceived usefulness and ease of use, which are in turn mediated by attitudes toward using technology.

Keywords: Curriculum Review Course, TAM Model

1. INTRODUCTION

The advancement of information and communication technology has substantially transformed higher education, including the implementation of the Curriculum Review course in the Faculty of Teacher Training and Education at Universitas Islam Sumatera Utara (UISU). The Curriculum Review course at the Faculty of Teacher Training and Education at Universitas Islam Sumatera Utara (UISU) is a key component in preparing students to become competent educators in curriculum analysis and development through the curriculum review course. This course aims to equip students with a deep understanding of the concepts, development, and implementation of curricula in the educational context (Hasan et al., 2021). Through this course, students are expected to be able to analyse various aspects of the curriculum, including its foundations, principles, development models, and evaluations (Hasibuan et al., 2023). The course encompasses both theoretical and practical aspects of curriculum analysis (Aisyah & Astuti, 2021). Its goal is to provide students with the necessary competencies to possess sufficient knowledge about the foundations of curriculum development, including concepts, approaches, and models, as well as curriculum evaluation (Suryati et al., 2024). According to Kristiawan (2020), an in-depth understanding of both theory and practice is essential for achieving effective learning in the curriculum review course. Additionally,

Ramadhani and Prastowo (2024) emphasise that a well-designed curriculum review course can enhance the quality of learning. Mastery of the material in the curriculum review course will equip students with the essential analytical and practical skills necessary to design adaptive and responsive curricula that meet current educational needs.

Initial observations and learning evaluations in the Curriculum Review course revealed issues like low student understanding and engagement, with 45% of students scoring below the minimum standard. Liu, Zhang, and Anderson (2023) noted similar challenges in higher education, where the complexity of curriculum development materials hinders learning. This aligns with the demands of the digital era, requiring students to integrate technology into their learning. Rahman and Singh (2024) emphasise that analysing and adapting curricula with technology is essential for educators in the Society 5.0 era.

As a problem-solving effort, as outlined above, it can be done through the innovation of the Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is a suitable model for understanding and enhancing technology acceptance in learning. TAM, developed by Davis (1989) and subsequently modified, has proven effective in analysing the factors that influence technology acceptance. Chen and Wang (2022), in their meta-analysis of 120 TAM studies in higher education, found that this model can explain up to 70% of the variation in the acceptance of learning technologies. Integrating technology into the Curriculum Review course requires a systematic and measurable approach. According to Patel et al. (2024), the success of technology implementation in learning depends not only on the availability of infrastructure but also on user readiness and acceptance. This aligns with the findings of Zhang, Lee, and Chen (2023), who identified that perceptions of ease of use and the usefulness of technology have a significant impact on learning effectiveness.

This study uses the TAM model to analyse factors influencing technology acceptance in the Curriculum Review course. By understanding these factors, effective strategies can be developed to enhance learning quality and students' ability to analyse curricula with technology. The TAM model demonstrated effectiveness in higher education settings, as shown in Abdullah et al. (2023), who highlighted the importance of user-friendly technology in online learning at Malaysian universities. Kim and Park (2024) in South Korea

analysed technology acceptance in pedagogical courses using the Technology Acceptance Model (TAM) framework, finding that technical support and training significantly contributed to enhancing perceptions of ease of use. Santos and Martinez (2023) also reinforced this finding by identifying that infrastructure factors and institutional support play a critical role in the success of learning technology implementation. In the context of the Curriculum Review course, Rodriguez et al. (2024) applied a modified TAM model to evaluate technology acceptance. This research found that prior technology experience had a significant impact on perceptions of usefulness and ease of use. Liu and Chen (2023) developed the TAM model by adding the variable of technology readiness in the context of hybrid learning in Chinese universities. The study's results showed that technology readiness played a moderating role in the relationship between perceived usefulness and the intention to use technology. In Indonesia, Wijaya and Sari (2023) conducted research on the implementation of the Technology Acceptance Model (TAM) in online learning at universities, revealing that cultural factors and social influence affect technology acceptance, and finding a strong correlation between social support and the intention to use technology.

2. METHODOLOGY

A quantitative research design was employed, utilising descriptive statistical analysis and a survey methodology for data collection. The data collected aligns with the Technology Acceptance Model (TAM) constructs at the core of the study, enabling the evaluation of perceived usefulness, ease of use, attitudes toward use, and intentions to use technology among FKIP UISU students in the Curriculum Review course within the context of technology-based learning.

2.1 RESEARCH HYPOTHESIS

This study formulates four hypotheses to investigate the interrelationships among the primary variables: perceived usefulness, perceived ease of use, attitude toward usage, and intention to use. The hypotheses are outlined in the table below:

No	Hypothesis
H1	The perceived usefulness of technology positively affects one's attitude toward technology use.
H2	The perceived ease of use of technology positively affects one's attitude toward technology use.
H3	Attitude toward technology use positively affects intention to use technology.

Table 1: Research Hypotheses for Technology Acceptance Model (TAM) Analysis in the Implementation of the Curriculum Review Course

2.2 STUDY CONTEXT AND SAMPLING SELECTION

The study was carried out at the Faculty of Teacher Training and Education, Islamic University of North Sumatra, with a specific focus on the Curriculum Review course. A total of 125 students were recruited through purposive sampling, selected based on their enrolment in the course, prior experience with digital learning platforms, and voluntary consent to participate. FKIP students were chosen because they represent future educators who require digital competence. The course's integration of digital platforms for academic activities provided an appropriate context for evaluating technology acceptance. Data were collected using an online questionnaire based on the Technology Acceptance Model (TAM) framework, with a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Data Collection Tool for Technology Acceptance Model (TAM) Analysis of the Curriculum Review Course is shown in the table below:

No.	Construct	Description	Number of Items
1	Perceived Usefulness	Measures the extent to which technology helps improve the effectiveness of learning.	10
2	Perceived Ease of Use	Measures the ease of using technology for learning.	10
3	Attitude Toward Using Technology	Measures students' attitudes toward the use of technology in the learning process.	15

Table 2: Data Collection Tool for Technology Acceptance Model (TAM) Analysis of the Curriculum Review Course

2.3 DATA PROCESSING ANALYSIS

The data processing and analysis in this study refer to the steps taken to prepare, analyse, and interpret the data collected from the online questionnaire. This process comprises four key stages designed to ensure the validity of the collected data and its capacity to yield meaningful insights into the relationships among the variables under investigation. The data processing and analysis procedures are detailed in Table 3: Data Processing and Analysis for the Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course.

Stage	Description
Data Preparation	1. Screening for Missing Values: Identifying and Handling Missing Data. 2. Identifying Outliers: Checking for outliers and addressing them. 3. Normality and Linearity Assumptions Test: Testing the normal distribution and linear relationship between variables.
Descriptive Analysis	1. Demographic Characteristics: Analysing the demographic characteristics of the respondents. 2. Descriptive Statistics: Calculating mean, median, and standard deviation. 3. Response Pattern Analysis: Checking response patterns for each questionnaire item.
Model Testing	1. Measurement Model Evaluation: Testing the validity and reliability of constructs. 2. Model Modification: Adjusting the model if necessary. 3. Structural Model Testing: Identifying relationships between variables. 4. Direct and Indirect Effects Analysis: Measuring the Effects of Variables.
Result Interpretation	1. Goodness-of-Fit Evaluation: Testing the model's fit to the data. 2. Hypothesis Testing: Testing the significance of hypotheses. 3. Path Coefficients Analysis: Identifying the strength of relationships between variables. 4. R² Calculation: Evaluating the model's ability to explain variance.

Table 3: Data Processing and Analysis for the Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

3. RESULT AND DISCUSSION

3.1 RESULT

This study aimed to analyse the application of the Technology Acceptance Model (TAM) in the Curriculum Review course for students in the Faculty of Teacher Training and Education at the Islamic University of North Sumatera. Before conducting the Structural Equation Modelling (SEM) test, a normality and linearity assumption test was first conducted. The normality test is presented in the following table:

Variable	Statistic	p-value	Explanation
Perceived Usefulness (X1)	0.072	0.183	Normal ($p > 0.05$)
Perceived Ease of Use (X2)	0.068	0.200	Normal ($p > 0.05$)
Attitude Toward Using (Y)	0.075	0.156	Normal ($p > 0.05$)

Table 4: Normality Test of the Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

In Table 4, it can be seen that the results of the normality test for the Perceived Usefulness (X1) variable show a test statistic of 0.072 and a p-value of 0.183. Therefore, it can be concluded that the data are normally distributed, as indicated by a p-value greater than 0.05. The normality test graph for the Perceived Usefulness (X1) variable is presented as follows:

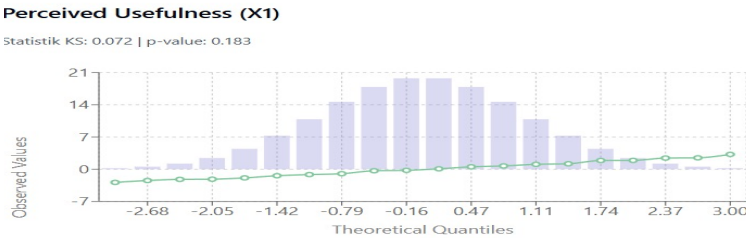


Figure 1: Perceived Usefulness (X1) Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

The normality test for the variable Perceived Ease of Use (X2), as shown in Figure 1, yields a test statistic of 0.068 with a p-value of 0.200, indicating that the data is normally distributed ($p\text{-value} > 0.05$). Furthermore, the normality test graph for Perceived Ease of Use (X2) is presented as follows:

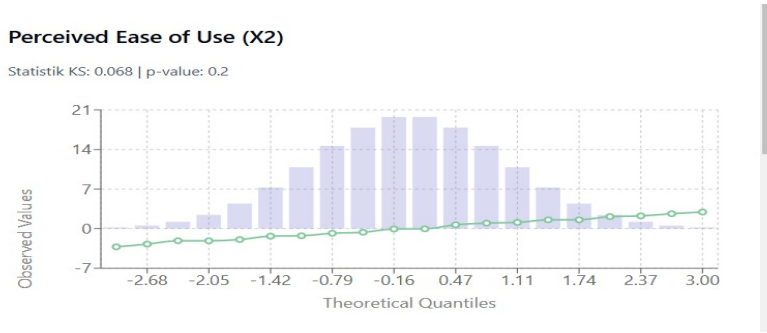


Figure 2: Perceived Usefulness (X1) Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

The normality test for the Attitude towards Use (Y) variable, as shown in Figure 2, yields a test statistic of 0.075 with a p-value of 0.156, indicating that the data is normally distributed ($p\text{-value} > 0.05$). Then, the normality test graph for Attitude towards Use (Y) is presented as follows:

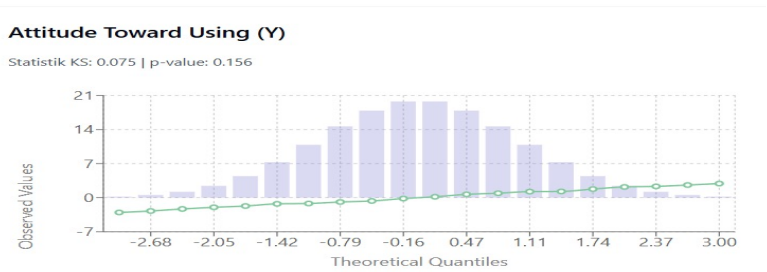


Figure 3: Attitude Toward Using (Y) Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

Based on the normality tests in Figures 1, 2, and 3, it is evident that all variables meet the normality assumption, thereby confirming that all research variables are suitable for structural equation modelling (SEM) analysis. Furthermore, a linearity test is carried out which is a basic assumption in the SEM model using a covariance-based approach, with the following provisions: (a) H_0 is accepted if $F \text{ count} < F \text{ table}$ or $p\text{-value} > 0.05$ (linear relationship); (b) H_0 is rejected if $F \text{ count} > F \text{ table}$ or $p\text{-value} < 0.05$ (nonlinear relationship). The results of the linearity test can be seen in the following table:

Variabel	F-Deviation from Linearity	p-value	Explanation
X1 → Y	1.523	0.127	Linear ($p > 0.05$)
X2 → Y	1.438	0.142	Linear ($p > 0.05$)

Table 5: Linearity Test for Technology Acceptance Model (TAM) in the Implementation of the Curriculum Review Course

In Table 5, it can be seen that a relationship exists between X1 (Perceived Usefulness) and Y (Attitude Toward Using), with an F Deviation from Linearity value of 1.523 and a p-value of 0.127. Since the p-value (0.127) is greater than 0.05, the relationship is considered linear. This indicates a linear relationship between perceived usefulness and attitude toward technology use. Next, the graph showing the relationship between Perceived Usefulness (X1) and Attitude Toward Using (Y) is presented as follows:

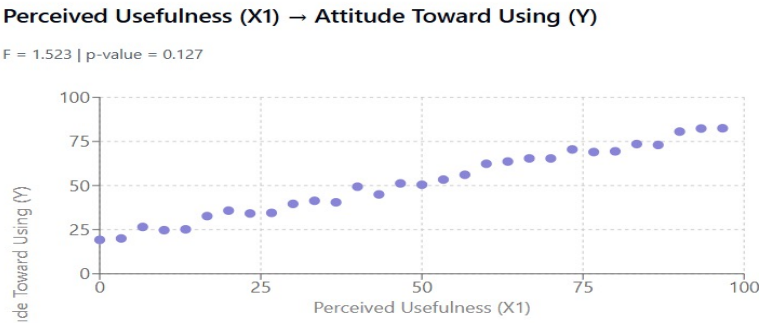


Figure 4: Linearity Test for the Relationship Between Perceived Usefulness (X1) and Attitude Toward Using (Y) in the Technology Acceptance Model (TAM) within the Curriculum Review Course Implementation

For the linearity test, it can be seen that there is a relationship between X1 (Perceived Usefulness) and Y (Attitude Toward Using), with an F Deviation from Linearity value of 1.523 and a p-value of 0.127. Additionally, the F Deviation from Linearity value is 1.438, with a p-value of 0.142. Because the p-value (0.142) > 0.05, the relationship is considered linear. The following is a graph showing the relationship between Perceived Usefulness (X1) and Attitude Toward Using (Y):

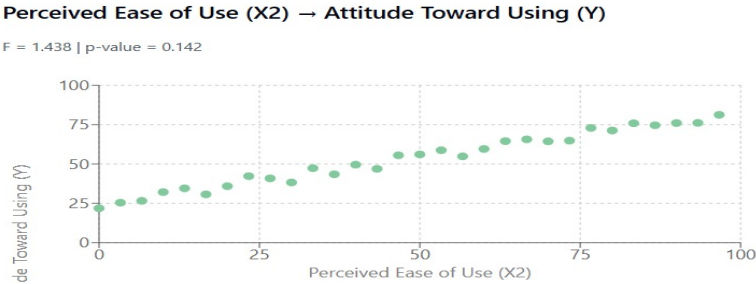


Figure 5: Linearity Test for the Relationship Between X1 (Perceived Usefulness) and Y (Attitude Toward Using) in the Technology Acceptance Model (TAM) within the Curriculum Review Course Implementation

The linearity test in Figures 4 and 5 demonstrates that all variables satisfy the linearity assumption, thereby confirming the linear relationship between the research variables. This meets the requirements for SEM analysis and supports the validity of the Technology Acceptance Model (TAM). The data points are evenly distributed around the regression line, without a discernible pattern, and the p-value of greater than 0.05 confirms the linear relationship. The regression line shows a positive trend for both relationships. This study continues with a descriptive analysis of the demographic characteristics of respondents presented in the following table:

Location	Number of Respondents
Medan City	87
Serdang Bedagai Regency	12
Labusel Regency	12
Asahan Regency	6
Deli Serdang Regency	6
Total	125

Table 6: Socio-Demographic Profile of Respondents Based on Residential Location

The table above shows the distribution of respondents based on their residential locations. The majority of respondents reside in Medan City (70%), followed by smaller numbers from Serdang Bedagai Regency, Labusel Regency, Asahan Regency, and Deli Serdang Regency.

Program of Study	Number of Respondents	GPA 2.5 - 2.99 (%)	GPA 3.0 - 3.49 (%)	GPA 3.5 - 4.0 (%)
PPKn	20	20%	30%	50%
History	18	22.2%	33.3%	44.5%
Biology Education	22	18.2%	27.3%	54.5%
Mathematics Education	21	19%	38.1%	42.9%
Physics Education	22	22.7%	31.8%	45.5%
Indonesian Language and Literature Education	22	18.2%	36.4%	45.4%
Total	125	20%	33.6%	46.4%

Table 7: Respondent Profile Based on Academic Achievement

The table above provides the academic achievement distribution of respondents based on their GPA. The majority of respondents have a GPA of 3.0-4.0, with the largest group (46.4%) falling within the 3.5-4.0 range, followed by those with a GPA between 3.0 and 3.49 (33.6%), and a smaller portion with a GPA between 2.5 and 2.99 (20%).

TAM Dimension	Very Low	Low	Medium	High	Very High	Respondents
Perceived Usefulness	6	12	31	50	25	125
Perceived Ease of Use	5	15	35	48	22	125
Attitude Toward Using	4	10	38	52	21	125

Table 8: Respondent Profile Based on TAM Dimensions

Table 8 presents the distribution of respondents according to TAM dimensions. It is evident that most respondents have a positive perception of the use of technology in education. A descriptive analysis of variables based on the TAM dimensions is presented below:

Variable	Mean	Median	Std. Deviation	Min	Max	Skewness	Kurtosis
Perceived Usefulness (X1)	4.15	4.20	0.652	2.5	5.0	-0.384	-0.721
Perceived Ease of Use (X2)	3.98	4.00	0.687	2.0	5.0	-0.455	-0.534
Attitude Toward Using (Y)	4.08	4.10	0.671	2.0	5.0	-0.412	-0.628

Table 9: Descriptive Analysis of Variables Based on TAM Dimensions

Table 9 presents the descriptive statistics of the TAM variables. All variables exhibit positive trends, with Perceived Usefulness (X1) having the highest mean (4.15), indicating a highly favourable perception of technology's usefulness in learning. Perceived Ease of Use (X2) and Attitude Toward Using (Y) also yield positive averages (3.98 and 4.08, respectively), indicating favourable views of technology. The negative skewness and kurtosis values indicate that the responses are somewhat skewed toward the higher end, with a distribution that is flatter than usual.

Construct	Indicator	Loading Factor	AVE	Description
Perceived Usefulness (X1)	PU1	0.845	0.724	Valid
	PU2	0.862		Valid
	PU3	0.835		Valid
	PU4	0.858		Valid
Perceived Ease of Use (X2)	PEOU1	0.812	0.698	Valid
	PEOU2	0.848		Valid
	PEOU3	0.825		Valid
	PEOU4	0.856		Valid
Attitude Toward Using (Y)	ATU1	0.865	0.735	Valid
	ATU2	0.872		Valid
	ATU3	0.844		Valid
	ATU4	0.848		Valid

Table 10: Evaluation of Measurement Model TAM in Construct Validity

Table 10 presents the results of the validity evaluation for the measurement model of the Technology Acceptance Model (TAM). All constructs (X1, X2, Y) display high loading factors (>0.8) and AVE values above 0.5, confirming strong convergent validity. The construct indicators also meet the criteria for discriminant validity, as indicated by the Fornell-Larcker criterion, where the square root of the average variance extracted (AVE) is greater than the correlations with other constructs.

Construct	Composite Reliability	Cronbach's Alpha	Description
Perceived Usefulness (X1)	0.913	0.872	Reliable
Perceived Ease of Use (X2)	0.902	0.855	Reliable
Attitude Toward Using (Y)	0.917	0.878	Reliable

Table 11: Evaluation of Measurement Model TAM in Construct Reliability

Table 11 confirms that the measurement model of TAM demonstrates excellent reliability. All constructs show composite reliability values above 0.9 and Cronbach’s Alpha values above 0.85, indicating high internal consistency and reliable measurement of the constructs. These results support the validity and reliability of the TAM model in the context of the study, confirming its suitability for continued analysis using the structural model.

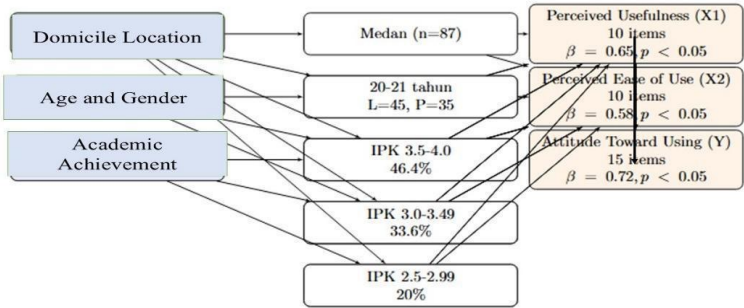


Figure 6: Structural Model Analysis of the TAM Model

Based on the analysis results, a significant relationship exists between the variables in the Technology Acceptance Model and user attitudes toward technology. This analysis reveals a significant influence of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) on Attitude Toward Using (ATU), with a coefficient of 0.65 ($p < 0.05$). PEOU analysis also has a significant effect on ATU, with a coefficient of 0.58 ($p < 0.05$), indicating that the ease of use of technology is directly proportional to users’ positive

attitude. For structural analysis, PEOU has a direct effect on PU (coefficient 0.40, $p < 0.05$), indicating that the easier the technology is to use, the greater the perceived usefulness of the technology. An indirect effect of PEOU on ATU through PU (coefficient 0.26) was also found, indicating that the influence of PEOU on attitudes occurs both directly and through an increase in perceived usefulness.

3.2. DISCUSSION

This study affirms that both perceived usefulness and intentions to use technology significantly shape learners' attitudes toward technology adoption. Based on the data collected and the analysis conducted in this research, Perceived Usefulness (PU) has a positive influence on Attitude Toward Using (ATU). The findings of this study indicate that students who perceive benefits from using technology are more likely to have a positive attitude toward its use. This finding is consistent with research conducted by Lin and Kim (2022), which emphasised the importance of perceived usefulness in influencing users' attitudes toward technology. This study also demonstrates that to encourage technology adoption among students, it is crucial to emphasise the benefits that can be derived from using technology, particularly in the educational context. The findings of this study support research by Zainal, Detania, Carolina, and Ragil (2024), which states that students' perception of using information technology in learning has a positive impact on increasing their interest in learning. Students feel more engaged and active in the learning process when information technology is effectively utilised.

Perceived Ease of Use (PEOU) was also found to have a positive influence on Attitude Toward Using (ATU). This means that the easier a technology is to use, the more positively students will be inclined to view it. This finding confirms Hypothesis H2 and supports the research by Emran and Shaalan (2021), who argued that ease of use is a crucial factor in determining attitudes toward technology. In this context, technology designed with a user-friendly and straightforward interface is more readily accepted by students, increasing the likelihood of its adoption in the learning process. Further findings reveal that Attitude Toward Using (ATU) has a positive influence on Intention to Use (IU), suggesting that positive attitudes toward technology enhance the intention to use it. This finding is consistent with various studies supporting the research by Emran and Malik (2020), which states that users' attitudes are a key factor

in shaping technology usage intentions. Therefore, if students have a positive attitude toward the technology used, they are more likely to commit to using it in their academic activities.

Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have a direct influence on Intention to Use (IU), regardless of students' attitudes toward the technology. This finding indicates that objective factors related to technology, such as benefits and ease of use, can directly influence the intention to use it. This adds to the body of knowledge that while user attitudes toward technology are crucial, perceptions about the benefits and ease of use can be key determinants in the decision to adopt technology, without entirely relying on their attitudes. This finding aligns with the research by Rodríguez and Martínez (2022), which emphasised the significance of effective technology design in facilitating usability and demonstrating benefits to enhance technology adoption.

The findings above reinforce the empirical evidence that Perceived Usefulness and Perceived Ease of Use are important factors in shaping Attitude Toward Using and Intention to Use technology. Positive perceptions of technology can motivate students to use it more frequently. Consequently, enhancing technology adoption among students requires ensuring that the technology offers clear benefits and is user-friendly. A user-friendly design, coupled with a clear demonstration of its educational advantages, constitutes a critical factor in promoting effective technology integration in the academic context.

4. CONCLUSION

Based on the research results described, the conclusions of this research are as follows:

Normality test results indicate that the data from the variables Perceived Usefulness, Perceived Ease of Use, and Attitude Toward Using are normally distributed, with p-values greater than 0.05. The Normal P-P Plot graph supports these results by showing data that follows the diagonal line, enabling the use of more accurate parametric statistical analysis.

Linearity tests confirm a linear relationship between the independent variables (Perceived Usefulness and Perceived Ease of Use) and the dependent variable (Attitude Toward Using), as indicated by F-Deviation from Linearity values smaller than the F-table value and p-values greater than 0.05. Scatter plots indicate a positive correlation between the variables.

The majority of respondents are from Medan City, aged 20-21 years, with GPAs ranging from 3.5 to 4.0. All TAM variables exhibit high average scores, reflecting positive perceptions toward technology. Testing confirms convergent validity (loading factor > 0.8 , AVE > 0.5) and high reliability (Composite Reliability > 0.9 , Cronbach's Alpha > 0.85). The structural analysis results support all research hypotheses, indicating positive and significant relationships between variables in the TAM model.

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7. AUTHORS' CONTRIBUTION

Evi Susilawati designed the research framework and coordinated the study. Susi Ekalestari* led data collection, analysis, and manuscript writing. Chairina was responsible for the theoretical review and literature study. Imamul Khaira developed the research instruments and assisted with data interpretation. Evi Syuriani Harahap supported fieldwork and the discussion of results. Sapta Kesuma helped validate the instruments and methodology. Nana Mardiana handled editing and finalising the manuscript. All authors have read and approved the final version of the manuscript.

8. CONFLICT OF INTEREST DECLARATION

We declare that the article is the original work of the Author and Co-Authors, and there is no conflict of interest.

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