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APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL TO CHAT GPT TO MEASURE THE CRITICAL THINKING POWER OF UIN SUNAN AMPEL SURABAYA STUDENTS

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Abstrak

Kemajuan kecerdasan buatan (AI) telah memberikan dampak besar di bidang pendidikan salah satunya melalui penggunaan ChatGPT dari OpenAI. Teknologi ini berpotensi meningkatkan proses pembelajaran, namun juga menimbulkan risiko seperti plagiarisme dan berkurangnya akuntabilitas mahasiswa. Penelitian ini bertujuan untuk mengetahui pengaruh ChatGPT terhadap kemampuan berpikir kritis dan pengambilan keputusan oleh mahasiswa dalam pembelajaran kesehariannya di kampus. Metode yang digunakan adalah metode kuantitatif dengan penyebaran kuesioner kepada mahasiswa aktif Strata 1 UIN Sunan Ampel Surabaya menggunakan teknik purposive random sampling. Analisis data dilakukan dengan metode SEM menggunakan alat bantu untuk mengolah data yaitu SmartPLS V4 dan teori Technology Acceptance Model (TAM). Hasil penelitian menunjukkan bahwa penggunaan ChatGPT berpengaruh positif terhadap peningkatan berpikir kritis, dengan variabel mediasi Desicion Making serta variabel Actual Use, Behavioral Intention to Use, Perceived Usefulness, dan Perceived Ease of Use sebagai faktor penentunya. Hasil penelitian ini diharapkan dapat memberikan kontribusi dalam memahami perilaku mahasiswa terkait penggunaan ChatGPT serta dampaknya terhadap penalaran ilmiah dan pengambilan keputusan.

Kata kunci: Metode Kuantitatif, Technology Acceptance Model, ChatGPT, Critical Thinking, Decision Making.

Abstract

Advances in artificial intelligence (AI) have made a big impact in the field of education, one of which is through the use of ChatGPT from OpenAI. This technology has the potential to improve the learning process, but also poses risks such as plagiarism and reduced student accountability. This study aims to determine the effect of ChatGPT on critical thinking and decision-making skills by students in their daily learning on campus. The method used is quantitative method by distributing questionnaires to active undergraduate students of UIN Sunan Ampel Surabaya using purposive random sampling technique. Data analysis was carried out using the SEM method using a tool to process data, namely SmartPLS V4 and the Technology Acceptance Model (TAM) theory. The results showed that the use of ChatGPT had a positive effect on increasing critical thinking, with the mediating variable of Decision Making and the variables of Actual Use, Behavioral Intention to Use, Perceived Usefulness, and Perceived Ease of Use as the determining factors. The results of this study are expected to contribute to understanding student behavior related to the use of ChatGPT and its impact on scientific reasoning and decision making..

Keyword: Quantitative Methods, Technology Acceptance Model, ChatGPT, Critical Thinking, Decision Making

INTRODUCTION

The development of artificial intelligence (AI) technology has brought significant changes in various aspects of life including education. One of the most prominent applications of AI today is ChatGPT (Generative Pre-trained Transformer), an intelligent chatbot that is widely used by students to find information, formulate ideas, and complete academic assignments [1]. On one hand, ChatGPT can provide easy access to information and support a more efficient learning process. On the other hand, there are concerns about its impact on students' critical thinking and decision-making skills. Along with the increasing dependence of students on ChatGPT, there is a risk of reducing the ability of in-depth analysis and critical reasoning that should be a core competency in higher education. This raises the important question of the extent to which the use of ChatGPT affects students' critical thinking and decision-making skills [2]. Data obtained from various studies show that while ChatGPT can assist in the learning process and scientific writing, its uncontrolled use can demotivate students to think independently and filter information analytically. An updated survey even shows that more than half of students use ChatGPT to complete academic assignments while most lecturers expressed concerns about potential cheating and decreased learning quality. This fact emphasizes the need for a strategic approach in integrating technology such as ChatGPT so as not to weaken students' cognitive abilities [3].

The Technology Acceptance Model (TAM) was used in this study to measure how perceived ease of use, usefulness, and intention to use ChatGPT affect critical thinking and decision-making aspects. Through this approach, the research not only focuses on the technical aspects of technology adoption but also on the psychological and behavioral dimensions of students in an academic context [4]. The findings of this study are expected to expand the literature and become a reference for higher education institutions in formulating AI utilization policies that are more wise, appropriate, and encourage the formation of adaptive, analytical, and responsible students. In addition, the integration of technology in the teaching and learning process cannot be separated from the role of educators as facilitators who are able to direct students not only to become users of technology but also to become critical thinkers who are able to utilize technology to develop ideas and solutions [1]. This research also highlights the importance of institutional policies in providing ethical and pedagogical guidance on the use of ChatGPT to remain in accordance with academic values.

In this context, the use of ChatGPT should not only be seen as a threat to originality, but also as an opportunity to enhance exploration and problem-solving skills if used reflectively. Students who are accustomed to critically evaluating ChatGPT output can actually develop stronger digital literacy skills, including in sorting out relevant and valid information [5]. This is crucial in shaping a generation of academics who are not only technically savvy but also intellectually resilient. By observing the increasingly massive use of ChatGPT in the university environment, there is a need for a comprehensive understanding of its impact in terms of user behavior. Therefore, this research is relevant and necessary to be carried out. With a focus on UIN Sunan Ampel Surabaya students, this research will measure how much influence the use of ChatGPT chatbot has on critical thinking and decision making with an integrative approach that combines the TAM Model and integrated behavior theory (Integrated Behavior Model).

METHODS

The flow/process of this research is described with practical and systematic steps for researchers to conduct research in the initial to final stages. Then a flowchart is given as follows

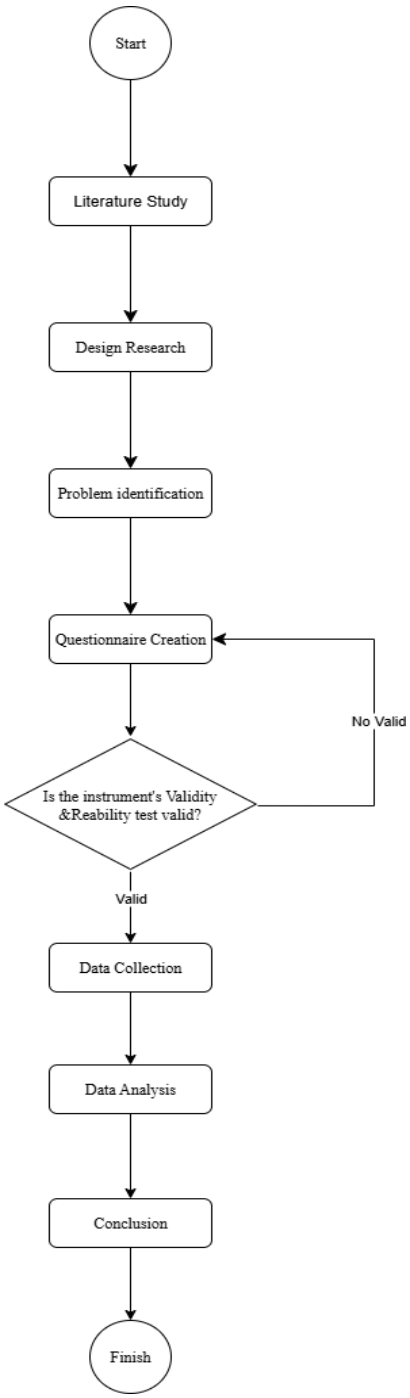

Figure 1. Research Process

This research method will explain in detail about the research methods used. In addition, this study also explains the techniques used for data collection and research instruments. The method used by researchers in this study is quantitative. Quantitative methods analyze certain populations or samples using positivist-based research [6]. The mindset of a researcher when conducting research has been described as a research approach. This approach is used to formulate the research or design that will be

used to conduct the investigation. A questionnaire instrument is used to obtain the required data. Data measurement in this questionnaire uses a Likert scale. The Likert scale, according to [7], is a means of measuring the attitudes, perceptions, and views of individuals regarding social events. Making a questionnaire based on a Likert scale must be really considered because it will later affect the calculations in Smart-PLS. Therefore, the questions must be adjusted to the needs under study in accordance with the research gaps. It is also stated by [6] that giving a score value to each statement cannot be determined arbitrarily, it must be tested first, so that in this study the Likert Scale is used as a measurement reference.

Table 1. Likert Scale

Value	Answer
1	Strongly disagree
2	Disagree
3	Disagree
4	Agree
5	Strongly Agree

Source: Book Prof. Sugiyono, 2019

Description:

1. Strongly Disagree (STS) - Score 1
   Respondents completely reject the given statement.
2. Disagree (TS) - Score 2
   Respondents disagree less, but do not completely reject.
3. Neutral (N) - Score 3
   Respondents are in the middle, neither agreeing nor disagreeing.
4. Agree (S) - Score 4
   Respondents agree with the given statement.
5. Strongly Agree (SS) - Score 5
   Respondents fully support the given statement.

A. Conceptual Model and Research Hypothesis

Below is an overview of the model design process of the research that will be used in conducting research later:

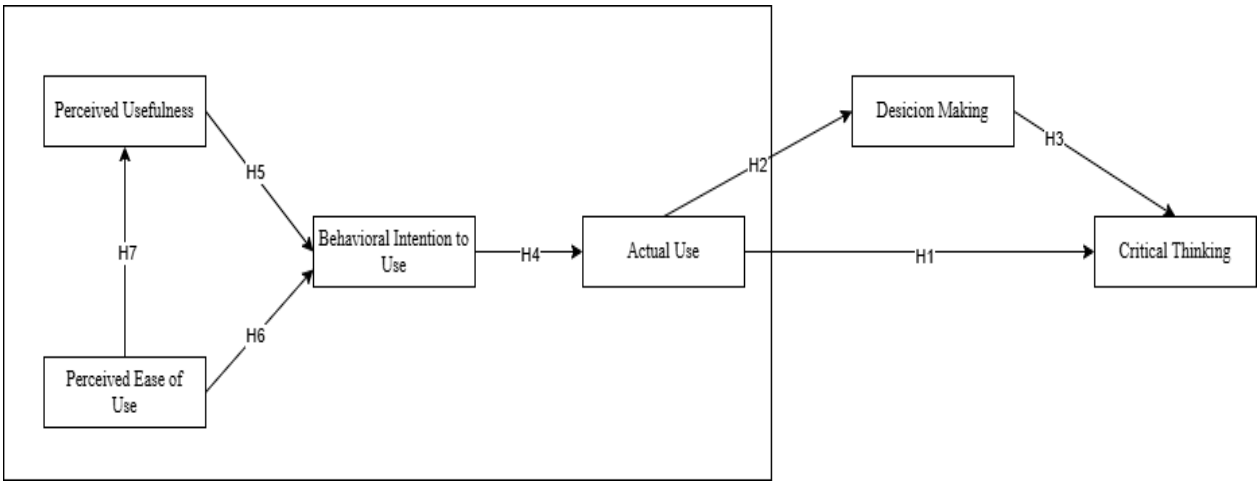

Figure 2. Conceptual Model of Research

Researchers conducted a study to measure the influence of external factors on the use and acceptance behavior of new technology or knowledge. They conducted this research using the

Technology Acceptance Model (TAM), which was created by Davis in 1989. The purpose of the TAM model is to find out how external variables affect internal variables, such as ease of use, perceived benefits, and social factors that influence people's decisions to accept or reject new chatbot technology, namely ChatGPT [8]. In this study also want to know how the application of new technology or science in real life to what extent the impact on the academic world is targeted at students who are in reality as active users, whether there is also an impact in doing critical thinking while measuring the level of influence on decision making. The reason researchers choose the TAM technique in processing data is because using this technique makes it easy to test several hypotheses at once in one analysis, which will provide a more holistic picure related to the data. And SEM analysis techniques can assist research in testing models that involve many variables and relationships between variables, both direct and indirect.

The sampling technique used in this study uses a random sampling model with the Slovin formula. The reason for using this technique is because it can control sample errors and can also minimize errors or can adjust the level of error that can occur when sampling from the population. Usually the type of error that occurs is the result of a small sample and does not reflect the population or systematic or better known as bias. Therefore, by using the slovin formula, researchers can determine an accurate sample size based on the total population that is known / determined. By combining random sampling, the sample fully reflects the characteristics of the entire population so that the research will be valid and by using random sampling it will reduce bias in non-random sample selection. The analysis tools used to process data, researchers use SmartPLS tools. The reason for using it is because it is suitable for general statistical analysis. SmartPLS is used because it makes it easy to measure the level of relationship between one variable and another, then TAM will be displayed in the form of graphs or tables so that it greatly helps research in presenting results in an attractive way and SmartPLS can measure small amounts of data efficiently, while SmartPLS is more inclined to be used for complex structural model analysis.

Based on the conceptual model as above, several hypotheses are obtained that support this research. The following is a description of the hypotheses obtained from the results of the conceptual model.

1. H1 = Actual Use has a positive effect on Critical Thinking

Actual Use is a variable to measure the extent to which the system is actually used by users. This is a real manifestation of Behavioral Intention that has been formed. This variable is usually measured through the frequency and duration of system use. In this study, this first hypothesis provides an initial description of whether Actual Use has a positive influence on Critical Thinking as measured later using the TAM model. The higher the level of technology use, especially ChatGPT, the more actual and better the individual's ability to think critically and make decisions

2. H2 = Actual Use has a positive effect on Decision Making seen from Critical Thinking

Critical Thinking is a trained and directed intellectual process to understand, analyze, evaluate, and apply information logically as a basis for decision making and action. This process involves observation, experience, reflection, reasoning, and communication. In education, critical thinking is important to encourage students to think independently, rationally, and not just accept raw information. The process of choosing an action or solution from several options will make a person think carefully. Which decision will be taken from several options. The options are then analyzed in depth, as well as evaluating arguments, and making rational judgments [9]

3. H3 = Decision Making has a positive effect on Critical Thinking

Decision Making in this context is the process of processing information and knowledge that occurs between perception and action (stimulus-response). In this research, Decision Making is defined as a ChatGPT user. The ChatGPT user will be measured whether there will be a significant influence on the Critical Thinking variable or not. This hypothesis is based on previous research related to the use of ChatGPT to support critical thinking [10].

4. H4 = Behavioral Intention to Use has a positive effect on Actual Use

Behavioral Intention to Use refers to a user's intention to use a particular system or technology in the future. In the behavioral decision variable in its use that affects actual use is belief, this research has been conducted by a researcher (Davis, 1989), they argue that a person's behavioral attitude is based on beliefs and available information.

5. H = 5 Perceived Usefulness has a positive effect on Behavioural Intention of Use

Perceived Usefulness is a measure of the extent to which a person believes that using a system will improve their performance. In other words, users will be more likely to accept technology if they feel that the technology provides real benefits in completing their tasks. User perceptions and attitudes are the main factors for usage intention in using ChatGPT, according to this variable [11].

6. H = 6 Perceived Ease of Use has a positive effect on Behavioral Intention to Use Perceived Ease of Use

is a person's level of belief that using the system does not require much effort. If a technology is considered easy to use, it will be accepted by users. In using ChatGPT, will it provide more value than before using the system, or the term is better known as perceived usefulness. In addition, according to research results [12] the use of ChatGPT has a positive effect on individual action interest (action intention).

7. H = 7 Perceived Ease of Use has a positive effect on Perceived Usefulness

This research defines several perceptions of ease of use of ChatGPT. The perceived ease of use of this chat bot technology has a positive impact on users' desire to use further. This finding is in line with the findings of previous research (Nikou & Economides, 2017) and other research from (Wilson, 2019). In addition, research has shown that individuals will be more interested in using a system if they find it easy to use [11].

B. Design Statement

1. Indicator Statement Variabel X

This section contains several indicators that represent variable X. The questions given to a respondent come from the indicators of variable X. Variable X consists of several indicators obtained from the TAM model. All variables from the TAM model will be represented in one, namely the Actual Use variable as one of the main variables of variable X. Below is a list of questions obtained from the model indicators in table as follows

Table 2. List of Question Indicators for Variable X

Variabel	Code	Statement
Actual Use	AU1	I use ChatGPT to increase my interest and motivation learning in lectures.
	AU2	I often use ChatGPT to improve my communication skills during lectures
	AU3	I use ChatGPT to help me better understand the lecture material
Behavioral Intention to Use	BIU1	I utilize ChatGPT for a longer period of time
	BIU2	I use ChatGPT in answering all problems in lectures
	BIU3	I would recommend using ChatGPT in the future
Perceived Usefulness	PU1	I feel real benefits in completing daily tasks using ChatGPT.
	PU2	I get time efficiency in finding information ad references using ChatGPT.
	PU3	I can improve the quality of my academic work because ChatGPT makes a positive contribution
Perceived Ease of Use	PEOU1	ChatGPT can help in completing lecture assignments
	PEOU2	The use of ChatGPT in an academic context is not difficult to do
	PEOU3	ChatGPT can help in finding new ideas

2. Indicator Statement Variabel Y

In this part of the chapter, it is detailed regarding several indicators that represent variable Y. The questions given to respondents come from several indicators that already represent variable Y. Below are some questions that come from variable Y indicators as follows:

Table 3. List of Question Indicators for Variable Y

Variabel	Code	Statement

Critical Thinking	CT1	I can think critically after getting answers from ChatGPT.
	CT2	I can evaluate the strengths and weaknesses of arguments and consider opinions explained by ChatGPT
	CT3	I can give rational reasons for arguments that are not in line with my opinion
		I always check the accuracy of sources used in doing coursework
	CT4	I consider the credibility of sources before concluding results in coursework
	CT5	I can experience more interactive and dynamic learning in critical thinking offered by ChatGPT
	CT6	

3. Indicator Statement Variabel Z

In this section, it is detailed regarding several indicators that represent variable Z. Variable Z acts as a moderator variable which serves to strengthen or weaken the relationship between the independent variable and the dependent variable. A question given to respondents comes from several indicators that already represent variable Z. Below are some questions that come from indicator Z as follows:

Table 4. List of Question Indicators for Variable Z

Variabel	Code	Statement
Decision Making	DM1	I am able to accept criticism and suggestions from others
	DM2	I'll respect other people's opinions even though they have different views
	DM3	I expect good results from the decisions that have been taken
	DM4	I believe that everyone needs to have goals and hopes as self-motivation to move forward
	DM5	I realize the consequences and risks of every decision taken

RESULTS AND DISCUSSION

Outer model testing is carried out based on the results of questionnaires that have been distributed to respondents. The purpose of this step is to test the validity and reliability of each indicator related to latent variables. Validity and reliability tests are carried out to ensure that the instruments used are able to measure constructs accurately [13]. Further explanation is presented in the following discussion.

A. Convergent Validity Test

The convergent validity test aims to assess the extent to which each indicator is highly correlated with the construct (latent variable) it measures. The factor loading value is used as the basis for assessing convergent validity at the indicator level. An indicator is declared valid if it has a factor loading value above 0.7. In addition, construct validity can also be seen from the results of the Average Variance Extracted (AVE) value, where a variable is said to be valid if the AVE value exceeds 0.5 [14]. The results of testing the 23 question items used in this study are presented in the following table:

Table 5. Convergent Validity Test Results

Variabel	Code	Outer Loading	AVE	Description
Actual Use	AU1	0,826	0,595	Valid
	AU2	0,733		Valid
	AU3	0,752		Valid
Behavioral Intention to Use	BIU1	0,885	0,702	Valid
	BIU2	0,822		Valid
	BIU3	0,806		Valid
Perceived usefulness	PU1	0,799	0,656	Valid
	PU2	0,799		Valid
	PU3	0,833		Valid
Perceived Ease of Use	PEOU1	0,857	0,632	Valid
	PEOU2	0,788		Valid

	PEOU3	0,736		Valid
Critical Thinking	CT1	0,736	0,550	Valid
	CT2	0,787		Valid
	CT3	0,725		Valid
	CT4	0,726		Valid
	CT5	0,761		Valid
	CT6	0,712		Valid
Decision Making	DM1	0,798	0,749	Valid
	DM2	0,830		Valid
	DM3	0,872		Valid
	DM4	0,912		Valid
	DM5	0,909		Valid

B. Discriminant Validity Test

Discriminant validity testing can be observed with the Fornell-Larcker Criterion value and the Cross loading value of the data obtained [15]. Below shows the value obtained as follows.

Table 6. Fornel-Larcker Results

Variabel	AU	BIU	CT	DM	PEOU	PU
AU	**0,771**					
BIU	0,460	**0,838**				
CT	0,563	0,577	**0,742**			
DM	0,441	0,354	0,531	**0,865**		
PEOU	0,473	0,635	0,587	0,424	**0,795**	
PU	0,716	0,716	0,566	0,293	0,738	**0,810**

Furthermore, the results of the discriminant validity test can be seen through the Cross loading value of each indicator. Based on the test results, all indicators have a Cross loading value above 0.7 which indicates that each indicator has goo.

Table 7. Cross Loading Result

Variabel	AU	BIU	CT	DM	PEOU	PU
AU1	**0,826**	0,306	0,581	0,401	0,313	0,367
AU2	**0,733**	0,414	0,310	0,197	0,297	0,376
AU3	**0,752**	0,369	0,371	0,393	0,488	0,404
BIU1	0,431	**0,885**	0,448	0,241	0,518	0,639
BIU2	0,406	**0,822**	0,521	0,431	0,526	0,597
BIU3	0,313	**0,806**	0,484	0,216	0,557	0,560
CT1	0,435	0,563	**0,736**	0,282	0,433	0,524
CT2	0,519	0,537	**0,787**	0,432	0,500	0,519
CT3	0,501	0,313	**0,725**	0,240	0,381	0,332
CT4	0,248	0,345	**0,726**	0,564	0,348	0,248
CT5	0,374	0,288	**0,761**	0,525	0,356	0,311
CT6	0,425	0,540	**0,712**	0,277	0,612	0,608
DM1	0,343	0,286	0,498	**0,798**	0,360	0,265
DM2	0,326	0,385	0,380	**0,830**	0,345	0,311
DM3	0,377	0,284	0,459	**0,872**	0,329	0,197
DM4	0,415	0,295	0,433	**0,912**	0,413	0,259
DM5	0,436	0,299	0,511	**0,909**	0,383	0,249
PEOU1	0,462	0,547	0,468	0,298	**0,857**	0,682
PEOU2	0,244	0,426	0,370	0,233	**0,788**	0,551
PEOU3	0,403	0,533	0,560	0,485	**0,736**	0,513
PU1	0,435	0,630	0,445	0,249	0,558	**0,799**

PU2	0,346	0,534	0,425	0,251	0,635	**0,799**
PU3	0,414	0,574	0,506	0,213	0,599	**0,833**

Discriminant validity against the construct it measures. Thus, these indicators are declared suitable for use in this research model. Details of the Cross loading results are presented in the following table.

C. Reliability Test

The reliability test is carried out using two indicators, namely using the Cronbach's Alpha value and Composite Reliability. A variable is said to have good reliability if both values are more than 0.6 [7]. The results of the reliability test that has been carried out on all data sourced from all respondents know that the reliability value of each variable has met these criteria. The calculation of the reliability test results is presented in the following table.

Table 8. Reliability Test Result

Variabel	Cronbach's alpha	Composite reliability	Description
AU	0,663	0,678	Reliabel
BIU	0,787	0,793	Reliabel
CT	0,837	0,843	Reliabel
DM	0,916	0,922	Reliabel
PEOU	0,708	0,720	Reliabel
PU	0,737	0,737	Reliabel

Hypothesis Testing

The results of the hypothesis test will provide a determination of the acceptance or rejection of a previously determined hypothesis. The bootstrapping procedure produces a t-statistic value for each relationship path in the model used to test the hypothesis. The Path Coefficient value, which has a value range of -1 to 1, is used in hypothesis testing in assessing whether there is a positive or negative effect on something. The t-statistic value is then compared with the t-table value. In this study, a confidence level of 95% was used, so the significance level (α) was 5% or 0.05. Thus the t-table value used is 1.96. If the t-statistic value is smaller than 1.96 (t statistic < 1.96), then the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected. The opposite is true if the t-statistic value is greater than or equal to 1.96 (t statistic ≥ 1.96), then H_0 is rejected and H_a is accepted. If the p-value is less than 0.1 and the T-statistic value is greater than 1.64, it can be said that the path is considered significant [14].

Table 9. Hypothesis Testing Result

Hipotesis	Path Coefisien	T statistics	P values	Description
AU -> CT	0,408	3,547	0,000	Positive and significant effect
AU -> DM	0,441	4,824	0,000	Positive and significant effect
DM -> CT	0,351	3,180	0,001	Positive and significant effect
BIU -> AU	0,460	4,410	0,000	Positive and significant effect
PU -> BIU	0,543	5,099	0,000	Positive and significant effect
PEOU -> BIU	0,234	1,926	0,054	Positive and no significant effect
PEOU -> PU	0,738	15,635	0,000	Positive and significant effect

1. Based on the results of hypothesis testing whose results have been presented in table 4.9, the following explanation is known. Based on the results of the hypothesis test analysis, a

coefficient value of 0.408 is obtained for the relationship between Actual Use (AU) and Critical Thinking (Y), which indicates a positive relationship between the two variables. The value of the T-Statistic is 3.547 and the P-Value of 0.000 is smaller than 0.05, indicating that the effect is significant. Therefore, the hypothesis of the variable AU → Y can be accepted.

2. Furthermore, the relationship between Actual Use (AU) and Critical Thinking (Y) through the mediation of the Decision Making variable (Z) shows a coefficient value of 0.441, which indicates a positive relationship. The T-Statistic value of 4.824 and P-Value of 0.000 smaller than 0.05 indicate that the effect is significant. Therefore, it can be said that the hypothesis of the variable AU → Z → Y can be accepted.
3. The relationship between Decision Making (Z) and Critical Thinking (Y) has a coefficient value of 0.351, indicating a positive relationship between the two variables. The T-Statistic value is 3.180 and the P-Value of 0.001 is smaller than 0.05, which means that the effect is highly significant. Therefore, the hypothesis of variable Z (Decision Making) → Variable Y (Critical Thinking) can be stated as accepted.
4. For the relationship between Behavioral Intention to Use (BIU) and Actual Use (AU), the coefficient value is 0.460 which indicates a positive relationship. The T-Statistic value is 4.410 and the P-Value of 0.000 is smaller than 0.05 The relationship between the Perceived Ease of Use (PEOU) variable and the Behavioral Intention to Use (BIU) variable has a coefficient value of 0.234, when viewed from the reference used, it shows a positive relationship. The T Statistic value of 1.926 and the P-Value of 0.054 slightly exceeds the 0.05 significance limit. However, this value still shows an influence that is close to significant. Therefore, the PEOU → BIU hypothesis can still be accepted with a note. The reason the value of the calculation is not significant is because the data obtained from respondents in using ChatGPT is in accordance with their needs and knowledge, so in this hypothesis it causes insignificance.
5. The relationship between the Perceived Ease of Use (PEOU) variable and the Behavioral Intention to Use (BIU) variable has a coefficient value of 0.234, when viewed from the reference used shows a positive relationship. The T Statistic value of 1.926 and the P-Value of 0.054 slightly exceeds the 0.05 significance limit. However, this value still shows an influence that is close to significant. Therefore, the PEOU → BIU hypothesis can still be accepted with a note. The reason the value from the calculation is not significant is because The data obtained from respondents in using ChatGPT is in accordance with their needs and knowledge, so in this hypothesis the cause is not significant.
6. Finally, the relationship between Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) shows a coefficient value of 0.738 which indicates a positive relationship. The T-Statistic value of 15.635 and P-Value of 0.000 smaller than 0.05 indicate a significant influence between PU on BIU. Therefore, the PEOU → PU hypothesis is acceptable.

Summary of Hypothesis Results

Table 10. Summary of Hypothesis Results

Hipotesis	Path	Description
H1	AU -> CT	Accepted
H2	AU -> DM	Accepted
H3	DM -> CT	Accepted
H4	BIU -> AU	Accepted
H5	PU -> BIU	Accepted
H6	PEOU -> BIU	Rejected
H7	PEOU -> PU	Accepted

Based on the hypothesis test calculations that have known the results according to table 4.18, it has been found that of the seven hypotheses proposed in this study, one hypothesis cannot be accepted, namely H6: Perceived Ease of Use → Behavioral Intention to Use. The rejected hypothesis is the result of statistical analysis which shows that there is not enough evidence to support the null hypothesis (H_0)

so that the alternative hypothesis (H_1) is considered closer to the truth. The hypothesis in the Perceived Ease of Use → Behavioral Intention to Use variable cannot be accepted because the statistical significance value (P value) exceeds the conventional limit of 0.05. However, Andrade (2019) emphasizes the importance of critically reviewing this perspective. The non-acceptance of the null hypothesis (H_0) does not mean that the hypothesis is not proven true but only indicates that the available statistical evidence is not strong enough to reject it at a predetermined level of significance. The p value itself only represents the probability of an outcome occurring if the null hypothesis (H_0) is true and is not an indicator of the correctness or incorrectness of the hypothesis itself. Therefore, the interpretation of research results should not be done in black and white (significant or insignificant), but seen as part of a wider range of probabilities. Thus this study shows that ChatGPT has significant potential as an effective and efficient tool for students to improve their critical thinking and decision-making skills in the hope of contributing to their future academic achievements. The level of use of ChatGPT by students is influenced by various factors including attitude towards technology acceptance, duration of use, perceived benefits, and ease of use.

Therefore, future development of ChatGPT should focus on aspects that support critical thinking and decision-making skills. This includes providing intuitive system navigation so that students can obtain information in a valid and structured manner, a functional and attractive user interface to support concentration and fundamental analysis, and relevant, accurate, and logical information sources to support critical and reflective thinking processes. By strengthening these aspects, it is expected that students will be more skilled in assessing the information obtained, able to consider various valid source options and make decisions based on logic and reasoning that are strong and accountable. In addition to good hopes for the development of this chatbot technology in terms of improving critical thinking skills and also wise decision making, the role of lecturers and universities is also very important in encouraging the effective and targeted utilization of ChatGPT. The use of this chatbot should be used to assist active and independent learning, but still under intense supervision so as not to cause excessive dependence and avoid negative impacts such as the practice of plagiarism or weakening academic ethics and responsibility.

CONCLUSION

The results of this study indicate that the use of ChatGPT has a significant impact on improving the critical thinking and decision-making abilities of students at UIN Sunan Ampel Surabaya in completing academic assignments. ChatGPT not only provides ease of access to information but also supports students in evaluating various options, formulating arguments, and reviewing issues from diverse perspectives, enabling them to make decisions with greater confidence and direction. Based on the Technology Acceptance Model approach, it is evident that students' perceptions of the usefulness and ease of use of ChatGPT significantly influence their intention and frequency of use. The consistent use of this chatbot has proven to have a positive impact on the development of students' critical thinking skills.

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