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Do Social Influence and Rationalization Determine the Use of Artificial Intelligence-ChatGPT in Higher Education Learning?

Evamillatul Qistiyah [1], Muhammad Sabandi [1*]
[1] *Universitas Sebelas Maret, Indonesia*

muhsabandi@staff.uns.ac.id*

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ABSTRACT

The use of AI-ChatGPT in education is a compelling topic, although research is limited due to its recent rapid development, necessitating further studies. This quantitative study used descriptive statistical analysis and involved 190 active students using ChatGPT in Indonesian higher education students. Purposive sampling was used for data collection via an online questionnaire. The gathered data were processed through partial least square technique. Purposive sampling was used for data collection via an online questionnaire. Validity was tested with Convergent and Discriminant Validity, and reliability with Cronbach's Alpha and Composite Reliability. The finding reveal that ChatGPT Use influence by social influence, rationalization, perceived usefulness, and perceived ease of use. Similarly, social influence significantly influences on perceived usefulness and perceived ease of use. Rationalization also significantly influences on perceived usefulness and perceived ease of use. Social Influence and Rationalization increase ChatGPT use in learning, with perceived Usefulness mediating the relationship and perceived ease of use also mediating it.

Keywords: *Artificial Intelligence, Technology Acceptance Model, ChatGPT in Learning, Social Influence*

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INTRODUCTION

In the era of rapid technological development, artificial intelligence (A.I.) has had a formative transformation effect in various fields, including education (Hwang et al., 2020). A.I. is a scientific discipline that originates from the fields of computing and engineering and is heavily influenced by other fields, including cognitive science, philosophy, neuroscience, and Economics (Zawacki-Richter et al., 2019). A.I. in education refers to computer systems capable of engaging in human processes such as learning, adapting, combining information, self-correction, and using data to handle complex processing tasks (Popenici & Kerr, 2017). A.I. is revolutionizing the field of education and learning by offering customized education and learning experiences, as well as providing intelligent tutoring systems {Formatting Citation} This is due to the ability of artificial intelligence (AI) tools to produce a variety of content, both written and unwritten, which is generally distinguished by a high level of uniqueness, consistency of ideas, and depth of existing scientific understanding (Quintans-Júnior et al., 2023).

GPT chat is one of A.I.'s widely used chatbot platforms. This tool has attracted significant interest among students worldwide (Tlili et al., 2023; Suhono, 2023). ChatGPT can produce text similar to human answers, brilliant text in response to

questions and requests submitted by users, including answers to homework assignments and exam questions (Boubker, 2024). Therefore, this tool can help students do assignments, answer questions, create, classify, summarize texts, make presentations, and translate languages. So, ChatGPT can revolutionize education by providing an interactive, personalized learning experience so that many students use this tool as a learning aid (Lameras & Arnab, 2021). Therefore, experts regard ChatGPT as a double-edged sword (Palal et al., 2023). This aligns with Tlili et al. (2023), who stated that ChatGPT effectively increases opportunities for educational and learning success by providing users (teachers and students) with basic knowledge about sharing topics. Apart from that, ChatGPT is considered efficient in providing a comprehensive understanding of various topics in easy-to-understand language (Choi et al., 2023). Based on this, ChatGPT will change the paradigm in conventional teaching delivery approaches and encourage future learning reform because of digital potential especially in higher education fields (Chen et al., 2023). So in the future, learning process can do in everywhere via ubiquitous learning mechanism (Saif et al., 2024). ChatGPT offers various benefits for learning. Also, ChatGPT is u seful for the education and learning process (Dwivedi et al., 2023; Sugiarto & Suhono). So, it is necessary to investigate what makes A.I. technology, ChatGPT, easily accepted and developed among users. Regarding student involvement in learning, using ChatGPT increases student involvement in the learning process. This research also identifies psychological factors of user motivation that encourage students to use ChatGPT in learning for academic needs.

The use of GPT Chat for learning, as in the research of Tiwari et al. (2023), is determined by perceived Usefulness, perceived convenience, perceived credibility, perceived social presence, and hedonic motivation. As a result, all factors significantly influence students' attitudes and intentions to use ChatGPT except the perceived ease of use factor. Then, obey Boubker (2024). Social influence factors, perceived Usefulness, perceived ease of use, and quality of ChatGPT output on student satisfaction and the impact on individual students will improve learning outcomes when using ChatGPT. Huallpa et al. (2023) conducted similar research but to find out the factors that influence dependence using ChatGPT; the results were that social attitude variables had a negative effect in influencing dependence on A.I. Furthermorse, research by Watjatrakul (2013), which tested the main factors of technology adoption on the intention to use free mobile messaging services at universities resulted in the Social Influence factor influencing the intervening variables, namely technology knowledge, perceived ease of use, perceived Usefulness and perceived comfort, but the variable perceived Usefulness had no effect, significantly to the dependent variable, namely student attitudes and use of the university's automated messaging service. Subsequent research by Alalwan et al. (2017) aims to determine mobile banking technology adoption factors. The results show that effort expectancy and social influence factors do not significantly affect the adoption of mobile banking technology users. Subsequent research by Alshurafat et al. (2023) stated that opportunity, pressure, and Rationalization influence academic cheating behavior using ChatGPT.

Based on this description, there are still differences because the novelty of current research discussing the use of AI-based ChatGPT in the education sector could be more extensive, especially within the scope of tertiary students. A study related to the analysis of factors that influence students to use ChatGPT for learning found that what causes students to use ChatGPT is not only because it is useful in learning. However, other facts were also found, such as the use of ChatGPT being influenced by

other factors. This causes a gap between the research that has been carried out and the existing facts. Apart from that, there is still limited literature regarding research on the application of GPT chat by students for educational purposes and based on the discovery of gaps in results and differences in variables used in previous research, so it is necessary to carry out further research on the factors that influence a person's use of ChatGPT. This is the basis for researchers to answer the question of what factors influence the use of ChatGPT in learning by students. The main point of research is being important because, the results of this study can understand psychological factors such as social influence and how humans think rationally in accepting the use of new technology. So that the results of this study will have relevant results in the digital era, especially AI-based technology that is part of everyday life.

This research links other external factors that influence the use of ChatGPT, namely Social Influence and Rationalization in learning, by referring to the *Technology Acceptance Model (TAM) theoy*. The Technology Acceptance Model theory is a theory put forward by (Davis, 1989). This theory explains that the factors that encourage someone to adopt technology are influenced by attitude (attitude toward), which comes from perceived Usefulness and perceived ease of use, which is also influenced by external variables. Where the TAM theory aims to predict why someone uses and accepts information technology.

TAM is a type of theory that adapts the behavioral theory approach, which is widely used to study the process of adopting information technology. Ideally, a good model is not only able to predict but also able to explain (Fatamwati, 2015). In this TAM theoretical model, the indicators have been proven to be able to measure technology acceptance. Thus, using TAM will be able to explain why students in learning accept ChatGPT technology.

Hypothesis Development

Students consider ChatGPT to be a tool that helps them in learning. Thus, it is necessary to determine what makes ChatGPT popular and widely used among students as a learning tool. Perceived ease of use and perceived usefulness have been proposed as two main factors in determining the acceptance of new technology (Blanche et al., 2019) , and both factors are essential and reliable predictors of users' attitudes and intentions toward new technology. According to Davis (1989), perceived ease of use refers to technology making work easier and freeing up effort when using it. Then, according to the creator of the TAM theory, Davis (1989), perceived ease of use positively influences perceived usefulness and indirectly influences intention to use by increasing attitudes towards new technology.

Several studsies have investigated the role of perceived ease of use in technology adoption; for example explored the role of perceived ease of use in the adoption of mobile payment systems (Abdul-Halim et al., 2022; Wulandari et al., 2024). Another example research conducted by Boubker (2024) shows that perceived ease of use significantly impacts students' use and satisfaction when using ChatGPT in Morocco. In addition, previous research has found that perceived ease of use is strongly related to perceived Usefulness in the future and influences attitudes related to user acceptance of a new technology system (Davis, 1989). Based on this description, perceived ease of use measures how minimal effort is required and how easy it is to use new technology for someone; in this case, the technology system in question is ChatGPT. Based on the previous research that has been described, this research focuses on determining the significance of perceived ease of use on users' perceived Usefulness and use of ChatGPT.

H1: Perceived Ease of Use positively and significantly influences the Perceived Usefulness of ChatGPT on learning in higher education.
H2: Perceived Ease of Use positively and significantly influences the use of ChatGPT on learning in higher education.

The Relationship Of Perceived Usefulness to ChatGPT Use

Perceived Usefulness refers to an individual's subjective perception and belief in the progress of applying information technology or a particular work process (Lin et al., 2007). Numerous studies have identified perceived ease of use and perceived usefulness as key factors predicting long-term adoption (Peng & Lai, 2012). The TAM theory is based on the idea that perceived Usefulness and perceived ease of use are essential determinants in predicting user attitudes and intentions in adopting technology (Davis, 1989). The new technology in question is ChatGPT, which has recently become popular among students as a learning tool. Many previous studies have used TAM as a psychometric tool, which is considered effective for assessing consumer acceptance of new technology and has been widely used to explain and predict the use of various existing information technologies (Abbasi et al., 2022).

An example of previous research conducted by Tiwari et al. (2023) investigated the role of perceived Usefulness on students' attitudes and intentions in using ChatGPT for learning purposes in Oman with positive results. Previous studies have shown the direct and positive effect of perceived usefulness on technology use (Islam, 2013). As discussed previously, TAM proposes the following relationships or constructs: a) Intention to use technology is positively influenced by attitudes towards use and perceived Usefulness; b) Attitudes towards the use of technology are positively influenced by perceived Usefulness and perceived ease of use; c) Perception of Usefulness is directly influenced by perception of ease of use. So, in this research, we link perceived usefulness with ChatGPT.
H3: Perceived Usefulness has a positive and significant influence on the use of ChatGPT in higher education learning.

Social Influence Influences Perceived Usefulness and Perceived Ease of Use of Chat GPT.

Humans are social creatures that cannot be separated from social Influence. Social Influence involves intentional and unintentional efforts to change consumers' beliefs, perceptions, attitudes, and behavior toward a product (Bhukya & Paul, 2023). Meanwhile, according to Bhukya & Paul (2023), Social Influence involves intentional and unintentional efforts to change consumer beliefs, perceptions, attitudes, and behavior towards a product. Social Influence reflects the perceptions of people around students regarding the use and importance of using technology (Boubker, 2024). In MIS, social influence (subjective norm) has been found to predict the technology perception of usefulness (Alshurideh et al., 2023; Martínez-Gómez et al., 2022). In this research, the definition of Social Influence is the students' social environment that influences them to use ChatGPT.

This research links the Social Influence variable to Perceived Usefulness and Perceived Ease of Use, which refers to the Technology Acceptance Model Theory. This theory suggests that a person's motivation to adopt technology is influenced by attitude (attitude toward), which comes from perceived Usefulness and perceived ease of use, which is also influenced by external variables (Davis, 1989). One of the external variables in this research focuses on the Social Influence variable. According to Boubker (2024), the social influence factor significantly influences students' motivation to use ChatGPT and student satisfaction when using ChatGPT, thereby improving

their learning outcomes. Therefore, this research focuses on finding out how significant social influence is on the perceived usefulness and ease of use of ChatGPT.
H4: Social Influence positively and significantly influences the Perceived Usefulness of ChatGPT on learning in higher education.
H5: Social Influence positively and significantly influences the Perceived Ease of Use of ChatGPT on learning in higher education.

Rationalization influences Perceived Usefulness and Perceived Ease of Use of ChatGPT.

According to (Free, 2015), Rationalization refers to a thought or psychological process that leads individuals to justify behavior, creating logical or rational reasons to support their actions because of emotional motivations and intentions that may be difficult to accept directly. In other words, students with a stronger Rationalization factor tend to use ChatGPT because they think that using ChatGPT in learning is right. Therefore, if students feel justified and rational when using ChatGPT, they will frequently use the A.I. tool.

This research links the Rationalization variable to Perceived Usefulness and Perceived Ease of Use, which refers to the Technology Acceptance Model Theory. This theory suggests that a person's motivation to adopt technology is influenced by attitude (attitude toward), which comes from perceived Usefulness and perceived ease of use, which is also influenced by external variables (Davis, 1989). Another external variable in this research focuses on the Rationalization variable. Previous research conducted by Alshurafat et al. (2023) stated that Rationalization positively affects students' academic cheating behavior. *Rationalization* plays a very important role in shaping an individual's decision to do something. So, this research focuses on determining how significant the Influence of Rationalization is on the perceived Usefulness and perceived ease of use of ChatGPT.
H6: Rationalization positively and significantly influences the Perceived Usefulness of ChatGPT in higher education learning.
H7: Rationalization positively and significantly influences the perceived ease of use of ChatGPT in higher education learning.

The Relationship Of Social Influence to ChatGPT Use

Social Influence reflects the perceptions of people around students regarding the use and importance of using technology (Boubker, 2024). In this research, the definition of social influence is the social environment that influences students' use of ChatGPT.

This research links the external variable Social Influence to the use of ChatGPT, which refers to the Technology Acceptance Model Theory. This theory suggests that a person's motivation to adopt technology is influenced by attitude toward which comes from perceived Usefulness and perceived ease of use which are also influenced by external variables (Davis, 1989) External Variables In this research, one of them focuses on the Social Influence variable. According to Boubker (2024), the Social Influence factor has a significant influence on encouraging students to use ChatGPT and student satisfaction when using ChatGPT, thereby improving their learning outcomes. Thus, this research focuses on determining the significant level of direct Influence of Social Influence on the use of ChatGPT.
H8: Social influence has a positive and significant influence on the use of ChatGPT in higher education learning.

The Relationship Of Rationalization to ChatGPT Use

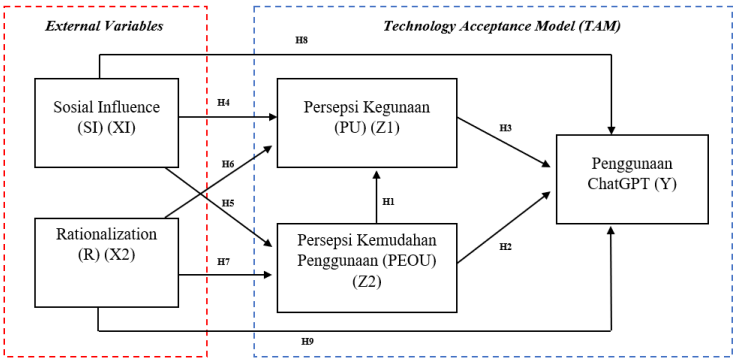
Rationalization refers to the thought or psychological process that leads individuals to justify behavior, creating logical or rational reasons to support their actions because of emotional motivations and intentions that may be difficult to accept directly (Free, 2015). In other words, students with a stronger Rationalization factor tend to use ChatGPT because they think that using ChatGPT in learning is beneficial and right. Students can rationalize their behavior by convincing themselves that using ChatGPT in learning is acceptable or assuming that everyone does it (Alshurafat et al., 2023).

This research links the external variable Rationalization to the use of ChatGPT, which refers to the Technology Acceptance Model Theory. TAM theory suggests that a person's motivation to adopt technology is influenced by attitude toward which comes from perceived Usefulness and perceived ease of use which is also influenced by external variables (Davis, 1989). The next External Variables In this research, the focus is on the Rationalization variable. Previous research conducted by Alshurafat et al. (2023) stated that Rationalization positively affects students' academic cheating behavior. Based on the previous research that has been described, this research focuses on finding out how significant the Influence of Rationalization is on the use of ChatGPT as a novelty in research.

H9: Rationalization has a positive and significant influence on the use of ChatGPT in higher education learning.

The research objective is aimed at outlining the relationships between variables as proposed in the research framework, shown as follows:

Figure 1. Research Framework



METHOD

Sample

Data was collected by distributing an initial questionnaire to test the validity of 70 respondents. The questionnaire was filled out online via Google Forms to obtain data, and it was distributed to the study population randomly for approximately two weeks. The total number of questionnaires returned was 210, which were then sorted until 190 samples were taken that met the criteria. This research used non-probability-purposive sampling, with the criteria being students who had used ChatGPT. According to Hair et al. (2014), the minimum number of samples that should be used is ten times the number of all research indicators. In general, a sample size of more than 100 is better, but smaller than 100 is also acceptable, depending on the research background. This study has 19 research indicators, so the required sample size is 19 x

10 = 190 samples that have used ChatGPT in learning. The sample used in this research was active students at Sebelas Maret University. These students were chosen as samples because, based on the survey results, the majority of visitors, 28.7% of ChatGPT users, were in the age range of 18 to 24 years, and ChatGPT is currently popular among students as a learning aid based on the fact that around one in five (19%) teenagers those who know ChatGPT have used it to complete tasks (Weebb, 2023).

Table 1. Sample Characteristics

	Descriptive Statistics	
Control Variables	Frequency	Percentage
Gender		
Man	56	29%
Woman	134	71%
Age		
16-20 years old	94	49 %
21-25 years old	96	51 %
>25 years	0	0
Educational background		
SENIOR HIGH SCHOOL	160	84
vocational school	30	16%
Force		
2020	48	25%
2021	44	23%
2022	52	28%
2023	46	24%
Have you ever received digital literacy materials?		
YES	149	78%
NO	41	22%

Measure

All items were measured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This research uses three types of variables, namely independent variables, dependent variables, and intervening variables. The following are the variables used in this research, Independent Variables namely Social Influence and Rationalization, Dependent Variables namely ChatGPT Use, and Intervening Variables namely Perception of Usefulness and Perception of Ease of Use.

Social Influence refers to the extent to which a person feels that other important people believe that he or she should use a new technological system; for example, peers, colleagues, and family members can significantly influence technology adoption (Queiroz et al., 2021). Social Influence has 6 question items that adapt Venkatesh et al. (2003) to measure Social Influence . This research uses indicators to measure *Social Influence* using 1) Subjective Norms, 2) Social Factors, and 3) *Image*.

Rationalization refers to the thought or psychological process that leads individuals to justify behavior, creating logical or rational reasons to support the actions they take because of emotional motivations and intentions that may be difficult to accept directly (Free, 2015). Rationalization has 6 question items that adapt Free's (2015) research

using indicators 1) Moral Justification; 2) Favorable Comparison; 3) Euphemistic Labeling; 4) Ignoring or misinterpreting consequences; 5) Distrust.

Perceived Usefulness refers to the extent to which a person believes that the use of a technology can improve his or her performance (Davis, 1989). Perceived usability has 5 question items adapted from Shen et al. (2022) and Venkatesh et al.z (2012) using indicators 1) Useful in education; 2) Improving the quality of learning; 3) Complete tasks faster; 4) Increase learning effectiveness.

Perceived Ease of Use refers to the extent to which a person believes that using a particular technology is easy and requires minimal effort (Davis, 19ss89). In this research, there are 6 Usage question items used to adapt Shen et al. (2022) including 1) Easy to use, Easy to master; 2) Efforts that are not complicated and do not require too much effort 3) Interactions are clear and understandable

ChatGPT use is defined as students using ChatGPT for voluntary purposes, preparing assignments, answering questions, generating, classifying, etc., with the aim of increasing educational success in acquiring knowledge in various fields (Boubker, 2024). For indicators of ChatGPT use, 1) Nature of Use; 2) Navigation Pattern; 3) Number of Site Visits (DeLone & McLean, 2003).

Control variables in this study, the researcher included several controls at the individual level, such as gender (1 = male, 2 = female), age (16 - 20 = 1, 21-25 = 2, > 25 = 3), education level (high school = 1, vocational school = 0), year of college (first = 1, second = 2, third = 3, fourth = 4), and digital literacy (ever = 1, never = 0).

This research is a quantitative type of research. The data in this research was processed using the Bootstrapping method with Hierarchical Regression Analysis via SmartPLS 3.0 software. Bootstrapping is a more valid and powerful method for testing the Influence of intervening variables (Hayes, 2009). Use validity, reliability, and multicollinearity tests to test the prerequisites for data analysis. Instrument validity is measured using SmartPLS and is divided into two categories: convergent validity and discriminant validity. Convergent validity assessment is based on standardized loading factors, with a value of > 0.7 considered valid (Ghozali, 2014), and a value of 0.5-0.6 is considered sufficient for the initial stages of developing a measurement scale (Ghozali, 2014). Discriminant validity assessment is done through cross-loading, where the cross-loading value of the indicator on its own variable must be higher than the correlation on other variables to show that the latent variable predicts its size correctly (Haryono, 2016). Reliability testing in PLS uses two methods: Cronbach's alpha and composite reliability. Cronbach's alpha measures the lower limit of the reliability of a construct and is considered reliable if > 0.6. Composite reliability measures actual reliability and is better at estimating internal consistency, with values > 0.7 considered reliable (Ghozali, 2014).

RESULT AND DISCUSSION

Reliability and Validity

Table 1 shows that the loading factor value for each construct of the latent variable, namely Social Influence, Rationalization, perceived Usefulness, Perceived Ease of Use, and use of ChatGPT, has a value of > 0.7, so it can be said to be valid. Apart from that, the AVE value for each variable is > 0.5, which means that the requirements for good convergent validity have been met and shows that the construct can describe 50% or more of the item variables.

Table 1. Valiity & Reliability Test Results

Construct	Factor loading	Average Variance Extracted (AVE)	Cronbach's alpha	Composite reliability (C.R.)
Social Influence		0,732	0,927	0,942
Influence of important people using ChatGPT	0,843			
Influence on the behavior of others using ChatGPT	0,865			
Many friends use ChatGPT	0,857			
The environment supports the use of ChatGPT	0,784			
The Influence of valued opinions of people who use ChatGPT	0,897			
Others have rated it well for using ChatGPT	0,881			
Rasionalization		0,620	0,880	0,907
Using ChatGPT for positive learning purposes	0,777			
Using ChatGPT is better than cheating	0,731			
Using ChatGPT to improve learning achievement	0,817			
Using ChatGPT is not a big problem because it doesn't harm anyone	0,788			
Everyone uses ChatGPT for learning	0,794			
Using ChatGPT is not illegal	0,815			
Perceived Usefulness		0,602	0,834	0,883
ChatGPT is useful in supporting education	0,722			
ChatGPT improves the quality of learning	0,801			
Using ChatGPT saves time	0,799			
ChatGPT Makes it easier to complete tasks faster	0,727			
ChatGPT increases learning effectiveness	0,823			
Perceived Ease of Use		0,705	0,918	0,935
ChatGPT is easy to use	0,854			
ChatGPT is flexible to interact with	0,864			
Ease of Operation of ChatGPT	0,854			
It's easy to make ChatGPT do what you want	0,896			
ChatGPT requires no mental effort/complexity	0,788			
ChatGPT interactions are clear and understandable	0,777			
Use of Chat GPT		0,796	0,948	0,959
Using ChatGPT in daily activities	0,913			
Love working with ChatGPT	0,925			
Often use ChatGPT for learning	0,943			
Looking forward to Aspects of work with the help of ChatGPT	0,761			
Frequently visit ChatGPT	0,936			
ChatGPT usage in recent months	0,860			

Based on Table 1 above, it can be seen that the Social Influence variable has a composite reliability value of 0.942 and Cronbach's alpha of 0.927. The Rationalization variable has a composite reliability value of 0.907 and Cronbach's alpha of 0.880. The Perceived Usefulness variable has a composite reliability value of 0.883 and Cronbach's alpha of 0.834. The Perceived Ease of Use variable has a composite reliability value of 0.935 and Cronbach's alpha of 0.918. The ChatGPT Usage variable has a composite reliability value of 0.959 and Cronbach's alpha of 0.948. All variables have composite reliability and Cronbach's alpha values > 0.7. Based on these results, it shows that all variables can be said to be reliable

Table 2. Discriminant Validity Test Results

Variable	Social Influence	Rationalization	Use of ChatGPT	Perceived Usefulness	Perceived Ease of Use
Social Influence	0,855				
Rationalization	0,638	0,788			
Use of ChatGPT	0,772	0,681	0.892		
Perceived Usefulness	0,502	0,575	0.561	0.776	
Perceived Ease of Use	0,307	0,492	0.511	0.438	0.840

The results of the discriminant validity of the model in this study are shown in Table 2, which is based on the Fornell-Larcker Criterion value. Table 2 shows that the Fornell-Larcker Criterion value for the Social Influence variable is higher when compared to the correlation value between Social Influence and other variables. This also applies to all other variables. Based on this, it can be concluded that this model has a good level of discriminant validity.

Common Method Variance

Data collection is obtained from respondents online, and respondents are always contacted. It promises rewards for lucky respondents so that this research obtains respondents according to the criteria, and it guarantees the confidentiality of respondent data according to the criteria for individuals who have used ChatGPT. Surveys conducted online can cause potential bias. Techniques were used to control bias in this study, according to Podsakoff et al. (2003), through the design of research procedures. First, researchers identify similarities between predictor and criterion variables, then eliminate these similarities through research design. Second, protecting respondents' anonymity and ensuring data confidentiality can reduce the tendency of individuals to edit answers to make them more socially desirable. Third, improving the scale items to avoid ambiguity in the measurement items is done by asking for an assessment of the characteristics of social desire or demand for each question item to identify things that need to be removed or rearranged.

Table 3. Descriptive Statistic and correlation

	K1	K2	K3	K4	K5	X1	X2	Z1	Z2	Y
K1	**1**									
K2	-0.122	**1**								
K3	-0.037	0.033	**1**							
K4	0.087	0.095	-0.017	**1**						
K5	-0.080	0.742**	-0.015	0.187**	**1**					
X1	0.070	-0.036	-0.104	-0.070	-0.069	**1**				
X2	0.017	-0.032	-0.066	-0.080	-0.058	0.608**	**1**			
Z1	0.006	-0.057	-0.045	0.042	-0.063	0.579**	0.619**	**1**		
Z2	0.035	-0.030	-0.086	0.047	-0.018	0.397**	0.490**	0.509**	**1**	
Y	-0.018	-0.64	-0.072	-0.071	-0.106	0.730**	0.628**	0.649**	0.487**	**1**
N	190	190	190	190	190	190	190	190	190	190
Min	0	1	0	0	0	12	13	16	18	6
Max	1	2	1	1	3	30	30	25	30	30
Mean	0.295	1.505	0.842	0.784	1.495	23.505	25.421	21.711	26.937	23.237
Std.Dev	0.456	0.500	0.365	0.411	1.113	4.270	3.785	2.449	2.828	5.355

Ket : **** p<0,001; *** p< 0,010; **p<0,05; *p<0,1

Sumber : Data Primer yang diolah 2024

Tabel 4. Predicting of Dependent Variables (Penggunaan ChatGPT

	Penggunaan ChatGPT		
	Model 1	**Model 2**	**Model 3**
Variable Control			
Gender	-0,02(0,38)	-0,07(1,41)*	-0,05(1,13)
Age	0,04(0,39)	-0,00(0,12)	0,01(0,25)
Educational background	-0,07(0,16)	0,00(0,08)	0,00(0,07)
Digital Literacy	0,02(0,22)	0,05(1,23)	0,02(0,44)
College Years	-0,18(0,04)**	-0,06(0,98)	-0,08(1,19)
Main effects			
Social Influence	-	0,57(9,13)***	0,46(7,04)***
Rationalization	-	0,28(3,77)***	0,13(1,72)**
Mediating Effects			
Perceived Usefulness	-	-	0,23(3,69)***
Perceived Ease of Use	-	-	0,13(2,43)***
Largest VIF	2,305	2,313	2,331
Goodness of Fit			
R ²	0,03	0,61	0,65
ΔR ²	-	0,58	0,04
Q ²	-0,03	0,56	0,56
SRMR	0,05	0,06	0,07
NFI	0,88	0,77	0,70

Ket : *<0,1 ; **<0,05 ; * <0,01**
Sumber : Data diolah Peneliti 2024

Table 5. Predicting of Mediating Variables (Perceived Usefulness and Perceived Ease of Use)

Type: *<0.1; **<0.05 ; * <0.01**

Variable	Perceived Usefulness		Perceived Ease of Use	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Variable Control				
Gender	0.11(0.80)	-0.05(0.94)	0.00(0.09)	0.00(0.01)
Age	-0.11(0.76)	-0.01(0.13)	-0.17(1.03)	-0.09(0.92)
Educational background	-0.01(0.16)	0.02(0.51)	-0.09(1.09)	-0.03(0.69)
Digital Literacy	0.16(1, 36)*	0.08(1, 42)*	0.02(0.26)	0.08(1.14)
College Years	-0.13(0.95)	-0.02(0.33)	0.13(0.95)	0.10(1.17)
Main effects				
Social Influence	-	0.31(4, 22)***	-	0.17(1, 93)**
Rationalization	-	0.34(4, 45)***	-	0.41(5, 29)***
Perceived Usefulness	-	0.21(4, 36)***	-	-
Perceived Ease of Use	-	-	-	-
Largest VIF	2,305	2,332	2,305	2,313
Goodness of Fit				
R2	0.09	0.52	0.02	0.28
ΔR ²	-	0.43	-	0.26
Q2	0.001	0.46	-0.05	0.21
SRMR	0.14	0.07	0.05	0.07
NFI	0.51	0.70	0.85	0.73

Table 6. Mediation Analysis with Bootstrapped Effect Estimates

Mediation Path	Indirect Effect	SE	CI 10%	CI 90%
Social Influence → Perceived Usefulness → ChatGPT Use	0,06***	0,02	0,03	0,10
Social Influence → Perceived Ease of Use → ChatGPT Use	0,02*	0,01	0,00	0,04
Rationalization → Perceived Usefulness → ChatGPT Use	0,07***	0,02	0,04	0,10
Rationalization → Perceived Ease of Use → ChatGPT Use	0,05**	0,02	0,02	0,08

Note : CI = confidence interval; SE = standard error

Table 3 presents the results of descriptive statistical analysis and correlation between all variables. The largest value of the Variance Inflation Factor (VIF) or Colinearity Statistics for the entire model is 2.33, far below the recommended cutoff value of 5 (J. F. Hair et al., 2014), this shows that there is no collinearity problem in the analysis of this research.

The indicators for measuring model suitability in this analysis are seen in the Normed Fit Index (NFI) and Standardized Root Mean Square Residual (SRMR) values, where the largest overall model NFI value is 0.88, which means it ranges between 0 and 1, where the value that is closer to 1 indicates better model fit (Bentler & Bonett, 1980). The overall SRMR value of the largest main variable testing model is 0.07, where the recommended one is ≤ 0.08, which means it shows a good model fit. (Hu & Bentler, 1999) . The criteria for a Q^2 value is> 0, which means it has predictive relevance (J.F. Hair et al., 2014); in this study, the Q^2 value for testing the main variables all met > 0.

Table 4. shows the results of regression analysis testing in model 1; researchers entered control variables to determine their effect on the dependent variable, namely the use of ChatGPT. The test results show that the variables gender, age, upper secondary education background and digital literacy have no effect on the use of ChatGPT. In contrast to the variable length of years of college, which shows negative and significant results on the use of ChatGPT, which means that the longer individuals have been in higher education, the less likely they are to use ChatGPT in learning. Successive t-values at K1, K2, K3, K4 and K5 are 0.38 ; 0.39 ; 0 , 16 ; 0, 22 ; 0 , 04 . This value shows significance < 1.28, so it can be concluded that differences in gender, age, upper secondary education background, and digital literacy do not affect the use of ChatGPT in learning.

The test results in Table 5 indicate that Social Influence (β= 0.31; t-value= 4, 22; p< 0.01) and Rationalization (β= 0.34; t-value= 4, 45; p< 0.01) both have a positive and significant relationship with Perceived Usefulness. It provides support for H4 and H6. Then, in accordance with H1, researchers found that Perceived Ease of Use (β= 0.21; t-value= 4, 36; p< 0.01) positively influences Perceived Usefulness. In relation to Perceived Ease of Use, the analysis shows the existence of Social Influence (β= 0.17; t-value = 1, 93; p< 0.05) and Rationalization (β= 0.41; t-value= 5, 29; p < 0.01) has a positive effect on Perceived Ease of Use of ChatGPT. This provides support for H5 and H7.

This research explicitly hypothesizes the direct impact of Perceived Usefulness H3 and Perceived Ease of Use H2 on the Use of ChatGPT, which is presented in Table 4. The findings of this research show a positive and significant relationship between Perceived Usefulness and Use of ChatGPT (β= 0.23; t-value= 3, 69; p < 0.01). Perception of Ease of Use with ChatGPT (β= 0.13; t-value= 2.43; p > 0.01), which means H2 is supported in this study. These findings are consistent with H4, H5, H6, and H7. Then, with regard to the dependent variable using ChatGPT, the analysis results show the existence of Social Influence (β= 0.46; t-value = 7.04 ; p < 0.01) and Rationalization (β= 0, 13; t-value= 1, 72, p < 0.0 5) has a positive effect on the use of ChatGPT, this shows that H8 and H9 are supported. Table 3 and Table 4 present details of the

regression analysis and model suitability value (which can be seen from the increase in R^2 and Q^2 values in each test model)

Baron & Kenny (1986) state that the mediation effect can occur fully or partially. Mediation must be tested through three regressions. First, the independent variable predicts the dependent variable. Second, the independent variable predicts the mediator. Third, the independent variable and mediator predict the dependent variable. The following three conditions must be met to support media results. First, the independent variable is proven to have a significant effect on the dependent variable in the first regression equation. Second, the independent variable is proven to have a significant effect on the mediator in the second regression equation. Third, the mediator must influence the dependent variable significantly in the third equation. Here, the independent variable and mediator are included as predictors. Full mediation occurs when the independent variable no longer influences the dependent variable after the mediator variable is entered; in other words, it becomes insignificant. Then, partial mediation occurs when there is a significant influence between the independent variable and the dependent variable after entering the mediator variable or when the level of significance decreases.

This research does not explicitly discuss the hypothesis regarding the mediating effect of Perceived Usefulness and Perceived Ease of Use, but this research adds a test of the mediation mechanism of Perceived Usefulness and Perceived Ease of Use in the relationship between Social Influence and Rationalization with ChatGPT Use. To further test the mediation effect, this study carried out a bias-corrected bootstrapping procedure by looking at the results of the specific indirect effect test (Hayes, 2009). The results in Table 6 show the positive significance of the mediating effect of Social Influence for Using ChatGPT through Perceived Usefulness (β= 0.06 ; p< 0.01; CI 10%= 0.03; 90%= 0.10), which means Perceived Usefulness partially mediates the relationship between Social Influence and ChatGPT Use. Then, the relationship between Social Influence and ChatGPT use was also tested for mediation effects through Perceived Ease of Use, which showed positive and significant results between the independent and dependent variables (β= 0.0 2 ; p < 0.1; CI 10%= 0, 00; 90%= 0.04) which means Perceived Ease of Use partially mediates the relationship between Social Influence and ChatGPT Use.

Next, the mediating effect of Perceived Usefulness and Perceived Ease of Use in the relationship between Rationalization and Using ChatGPT is tested, as shown in Table 6. Mediation effect of Rationalization for Using ChatGPT through Perceived Usefulness (β= 0.07 ; p< 0.01; CI 10% = 0.04; 90%= 0.10) which means that Perceived Usefulness partially mediates the relationship between Rationalization and ChatGPT Use. Then, the relationship between Rationalization and ChatGPT Use was also tested for mediation effects through Perceived Ease of Use, which showed positive and significant results between the independent and dependent variables (β= 0.0 5; p < 0.05; CI 10%= 0.02; 90%= 0.10) which means Perceived Ease of Use partially mediates the relationship between Rationalization and ChatGPT Use.

DISCUSSION

The main finding of this research reveal that ChatGPT Use influence by social influence, rationalization, perceived usefulness, and perceived ease of use. Similarly, social influence significantly influences on perceived usefulness and perceived ease of use. Rationalization also significantly influences on perceived usefulness and perceived ease of use. Social Influence and Rationalization increase ChatGPT use in

learning, with perceived Usefulness mediating the relationship and perceived ease of use also mediating it.

This research contributes to the TAM (Technology Acceptance Model) theory (Davis, 1989). In particular, when tested, the basic model of TAM theory in the context of technology adoption found that perceived usefulness, perceived ease of use, and other external variables determine technology adoption intentions as in the research. Since the operationalization or publication of the TAM theory (Davis, 1989), several studies have analyzed the determinants of someone adopting the use of new technology with Perceived Usefulness and Perceived Ease of Use in various countries in the world as in previous research (Alalwan et al., 2017; Boubker, 2024; Huallpa et al., 2023; Tiwari et al., 2023) However, the body of literature discussing this domain is still in the development stage and there are differences in research results. This research provides unique insights that can substantially increase understanding of the domain regarding factors for adopting new technology, in this case, Artificial Intelligence-ChatGPT in learning, especially in Indonesia. Thus, this research contributes to the TAM theory literature by analyzing and empirically testing the relationship between two external variables, namely Social Influence and Rationalization on the Use of ChatGPT. Next, this study tested the mediating effect of Perceived Usefulness and Perceived Ease of Use on the relationship between Social Influence and Rationalization with ChatGPT Use. Consistent with the conceptualization of TAM theory (Davis, 1989), researchers argue that Technology Acceptance is associated with perceived Usefulness and perceived ease of use of the technology by considering other external variables.

The findings in this research indicate that social influence and rationalization have a significant positive impact on the use of ChatGPT in learning. These findings show that when students see their friends or other people using and recommending ChatGPT, they will be more inclined to use ChatGPT in learning. Then, if more students feel that using ChatGPT makes sense and is useful in their learning, they are more likely to adopt ChatGPT. Overall, both Social Influence and Rationalization encourage students to use ChatGPT in their learning. This suggests that the social environment and logical thinking about the benefits of ChatGPT play an important role in college students' adoption of this technology. This is in accordance with previous research findings, which found that Social Influence was related to the use of ChatGPT (Boubker, 2024; Huallpa et al., 2023; Tiwari et al., 2023). Rationalization was added as an external variable to add novelty to the research, which resulted in significant results. Rationalization has a positive and significant effect on the use of ChatGPT, where Rationalization has been previously tested in research (Alshurafat et al., 2023), which tested the relationship between Rationalization and academic cheating with the help of A.I.

Furthermore, the calculation results of this research found that Perception of Usefulness partially mediates the relationship between Social Influence on ChatGPT Use and the relationship between Rationalization on ChatGPT Use. The perceived usefulness variable is included as partial mediation because it produces a significant influence when including the mediating variable in testing the relationship between the independent variable and the dependent variable. This indicates that part of the Influence of friends and the surrounding environment on the use of ChatGPT occurs because the Influence of the social environment makes individuals believe that ChatGPT is useful, and another part of the Influence is direct, their recommendations and encourages individuals to use ChatGPT, regardless of whether the individual is fully aware of the Usefulness of ChatGPT. In other words, perceived Usefulness, Social

Influence, and Rationalization are important in determining how often individuals use ChatGPT in learning. The results of this research align with the results of Watjatrakul (2013), who found that perceived usefulness mediates social influence in adopting voluntary service technology that is provided free of charge. Based on this, this research contains the idea that perceived Usefulness can mediate Social Influence and Rationalization factors in the use of ChatGPT in learning at Sebelas Maret University.

In the calculation results, Perceived Ease of Use partially mediates the relationship between Social Influence on ChatGPT Use and the partial Rationalization relationship on ChatGPT Use. The perceived ease of use variable is included as partial mediation because entering the mediating variable to test the relationship between the independent variable and the dependent variable produces a significant influence. This means that some indirect social influence makes individuals use ChatGPT. Social Influence makes individuals believe that ChatGPT is easy to use, and this belief encourages individuals to use ChatGPT in learning. Also, the reasons and justifications that students look for (Rationalization) make them realize that ChatGPT is easy to use. In other words, Social Influence and Rationalization also have a direct influence on ChatGPT usage that is not fully explained by perceived ease of use. The results of this research are in line with the results of research by Boubker (2024), which states that perceived ease of use has a significant effect on the use of ChatGPT.

This research also contributes to Davis's (1989) TAM theory, which states that a person's intention to adopt new technology is influenced by Perceived Usefulness and Perceived Ease of Use of the technology, which is also influenced by external variables. TAM theory provides evidence that perceived ease of use has an influence as a mediator on individuals to adopt new technology. Based on this, this research contains the idea that perceived ease of use can mediate Social Influence and Rationalization factors in the use of ChatGPT in learning at Sebelas Maret University. So, this could have implication when GPT Chat becomes a useful tool in supporting learning and is easy to use, and the surrounding environment socially influences them, it will make them more likely to use GPT Chat in learning. Higher education institutions can provide technical and accessibility support, such as easy access to GPT Chat. In addition, for the development of policies and guidelines, educational institutions can develop clear policies regarding the use of GPT Chat in academic contexts to ensure that this technology is used ethically and effectively. It will also provide a comprehensive and easily accessible usage guide to help students and lecturers understand how best to utilize GPT Chat in learning. The use of ChatGPT, especially in learning, can be in the form of a medium for providing material and explanations of basic and advanced concepts, as a provider of additional resources relevant to the topic being studied, as a learning aid in questions and answers regarding material and discussion of questions and understanding concepts, customized Adaptive Learning Tools with individual needs and can provide feedback, the media for developing critical thinking skills with ChatGPT facilitates debate and discussion, seeks access to the latest information regarding the latest news and trends, supports the teaching of teachers and lecturers in planning lessons by providing ideas for class activities, projects, and can assist in preparing learning materials such as modules, presentations, and so on.

This research proves that when someone rationalizes or provides logical reasons for using Chat GPT and that the tool is very useful and easy to use to aid learning, they tend to be more likely to adopt and use Chat GPT in learning. These findings provide input for universities that psychological factors play an important

role in shaping individual attitudes and behavior toward new technology and that a reasonable reason for using Chat GPT can motivate someone to actually use it. This research provides an overview of the benefits of using GPT Chat, such as efficiency in searching for information, improving writing skills, or assistance in understanding lecture material. Thus, students and lecturers have a rational justification for using Chat GPT. In addition to the implications that can be carried out in the previous description, higher education institutions need to carry out evaluation and monitoring of usage to monitor the use of Chat GPT among students and lecturers to assess the effectiveness of the steps that have been taken and identify things that need to be improved.

This research still has several limitations that may offer opportunities for future research steps. Future research can add or explore other external variables that are still related to the factors of adopting new technology, in this case, ChatGPT, or use different research methods. Apart from that, further research can add or expand the population with different objects to produce better research and be used as a literature reference for further research.

CONCLUSION

The results of this research are used to develop existing literature as well as references related to factors that influence students to adopt the use of ChatGPT in learning. More specifically, Social Influence and Rationalization can be determining factors that influence the use of ChatGPT in learning because the research results show that Social Influence and Rationalization have a positive and significant effect on the use of ChatGPT in learning. Apart from that, the results of this research also contribute to proving the Technolgy Acceptance Model theory by (Davis, 1989). In doing so, researchers contribute to theory development and provide directions for future research. Although there has been a lot of research on the use of A.I. tools in education, only a little has explored the factors of using ChatGPT in learning. Therefore, our study provides new empirical evidence about the impact of this technology.

AUTHOR CONTRIBUTION STATEMENT

The Author Contributions Statement can be up to several sentences long and should briefly describe the tasks of individual authors. Please list only two initials for each author, without full stops, but separated by commas (e.g. J.C., J.S.). In the case of two authors with the same initials, please use their middle initial to differentiate between them (e.g. REW, RSW). The Author Contributions Statement should be included at the end of the manuscript before the References. The Author Contributions Statement can be up to several sentences long and should briefly describe the tasks of individual authors. Please list only 2 initials for each author, without full stops, but separated by commas (e.g. J.C., J.S.). In the case of two authors with the same initials, please use their middle initial to differentiate between them (e.g. REW, RSW). The Author Contributions Statement should be included at the end of the manuscript before the References.

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