



RESEARCH ARTICLE

CHATGPT AND STUDENTS' CRITICAL THINKING SKILLS: A CORRELATIONAL ANALYSIS ON COMMUNICATION SCIENCE STUDENTS AT SINGAPERBANGSA KARAWANG UNIVERSITY

Erina Nur Rohmah ^{1*)} Weni A. Arindawati ^{2*)} Nurkinan ^{3*)}

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Abstract

Advances in artificial intelligence (AI) technology such as Chat GPT have had a major impact on the way students access and manage information in an academic environment. Despite its efficiency benefits, concerns have been raised about the potential reduction of critical thinking skills due to the tendency to rely on instant answers. This study aims to evaluate the extent to which the use of Chat GPT is related to the critical thinking skills of undergraduate students of Communication Studies Program at Singaperbangsa University of Karawang. The quantitative research method was used with the Uses and Effect theory as the foundation, and data was obtained from 126 students through the distribution of questionnaires. Analysis using simple linear regression test resulted in a significance value of $0.001 < 0.05$, so it can be concluded that there is a statistically significant influence between the use of Chat GPT and students' critical thinking skills. The findings show a significant positive relationship between the variables studied, with a significance value of $0.001 (p < 0.05)$ with the results of the calculation of the correlation coefficient of 0.631, it can be concluded that the level of relationship between the two main variables in this study, namely the utilization of Chat GPT and students' critical thinking skills, is included in the strong category.

Keyword: Chat GPT, Critical Thinking, Uses and Effect

Introduction

New media refers to a means or device that connects the sender and receiver in the communication process with flexible characteristics and allows two-way (Ginting et al., 2021). The presence of new media also brings the development of artificial intelligence (AI) technology, which brings various benefits, such as simplifying the implementation of tasks, increasing work efficiency, and accelerating the data analysis process.

One of the latest breakthroughs in the development of artificial intelligence technology is the presence of Generative Pre-Trained Transformers or GPT for short. This technology represents a significant advance in the ability of machines to mimic the way humans speak and communicate (Haenlein & Kaplan, 2019). The term "generative" refers to the capability of AI systems to generate new text or content that has never existed before, rather than simply copying or reassembling existing data. Meanwhile, "pre-trained" indicates that these models have undergone an extensive training process using millions to billions of data from various sources before being applied to a specific task. This pre-training process allows the model to better understand language patterns, structures and contexts. The term "transformer" refers to the advanced neural network architecture that is the main foundation in processing the context and relationships between words in sentences, making interactions more natural.



Source : (Annur 2024)

In the era of new media such as Chat GPT, digital literacy is needed because users need to understand how the media works to process and utilize information wisely. (Gilster, 1997) states that digital literacy is the ability to understand and use information from digital technology, which includes more than just technical skills. Without good digital literacy, users risk receiving inaccurate information and becoming dependent on technology. Therefore, digital literacy is an important foundation so that Chat GPT users do not passively receive information.

The rapid development of artificial intelligence (AI)-based technologies has brought about a major transformation in the modern education landscape. The presence of AI no longer

Fig 1. Most used AI applications in Indonesia

Singaperbangsa Karawang University

*) *corresponding author*

Erina Nur Rohmah

Email: erinanurrohmah4@gmail.com

simply serves as a complementary tool in the teaching-learning process, but has overhauled the way learners and educators access, manage and utilize information. One of the most popular examples of its application is the use of Chat GPT, which offers quick and efficient access to information. This convenience, while beneficial, has also led to a tendency towards dependency, where users, especially students, often choose to rely on AI to complete various academic tasks.

AI has now penetrated classrooms, both at school and university levels, by providing innovative digital solutions to support the effectiveness of the learning process (Mulianingsih et al., 2020). In practice, many students utilize services such as Chat GPT for a variety of academic needs—from understanding lecture material, doing assignments, to compiling reports or scientific papers (Wibowo et al., 2023). With the widespread use of this technology, important questions arise regarding its impact on students' cognitive aspects, especially critical thinking skills.

Therefore, it is necessary to conduct more in-depth research to examine whether there is a significant relationship between the intensity of using Chat GPT and the level of critical thinking of students, especially in an academic context that demands in-depth analysis, logical argumentation, and evaluative ability in absorbing and processing information.

Fig 2. Most used AI's, March 2024



Source : goodstats.

Critical thinking is the ability to identify, analyze and evaluate information independently. In the context of using Chat GPT among students, it can cause problems in the form of students who can lose the opportunity to develop the ability to conduct critical analysis because they depend on instant answers from AI (Maula et al., 2023). In the context of GPT Chat utilization, digital literacy serves as a cognitive filter so that students do not become passive users. AI does have the potential to accelerate the learning process and complete academic tasks, but if used excessively and without a reflective attitude and evaluative skills, this can actually lead to dependence (Dwivedi et al., 2021). Students may prefer instant solutions rather than going through a complex analytical thinking process. Therefore, it is important to examine the extent to which college students' interaction with AI technologies such as Chat GPT impacts their higher order thinking skills especially in terms of identifying, analyzing, and evaluating information.

This study analyzes the relationship between the intensity of GPT Chat utilization and college students' critical thinking skills, using the Uses and Effect theory by Sven Windahl (Rohim, 2009). This theory explains that media is actively selected by individuals to meet certain needs and can have an effect on behavior and cognitive abilities.

The benefit of this research is to provide new insights into the role of artificial intelligence in the world of higher education, especially in students' critical thinking skills through

the sub-variables of the amount of time (X1), the type of content (X2) and the individual's relationship with the media (X3).

Method

Quantitative research is research that uses statistics at every stage (Arikunto, 2019). Population refers to the set of individuals or elements that have certain characteristics according to research needs and have been determined based on specific criteria by researchers to analyze and draw conclusions. Meanwhile, according to (Nazir, 2005), population is understood as a group of people with certain characteristics that are relevant to the focus of the researcher's study. The population in this study highlights 2021 UNSIKA Communication Science students, especially students who are in their final semester and are preparing a thesis, which when referring to the data provided by the administration of the Faculty of Social and Political Sciences, there are 183 students in the 2021 batch who are taking thesis courses and are in semester 8.

Based on this data, there is a sample in the study taken based on the Slovin formula. The Slovin formula is used when researchers want to determine a proportional sample size from a certain population, especially if data on population variance is not available (Sevilla et al., 2007). The author made a sample calculation with the Slovin formula using a margin of error of 5%, resulting in a sample of 125.55 which was rounded up to 126 samples. This group was chosen because they had gone through the main learning process and were expected to have mature critical thinking skills. Critical thinking skills are important in higher education because they include the ability to analyze and evaluate information logically (Facione, 2015).

Communication Science students are considered relevant because they often interact with information technology, including Chat GPT, which has the potential to affect students' critical thinking skills. Using a quantitative approach, this study aims to examine the relationship between the utilization of Chat GPT and students' critical thinking skills, with a limited focus only on that aspect.

This research was conducted by distributing questionnaires to respondents periodically, the first distribution was made to 30 respondents outside the sample to conduct validity and reliability tests, both statistical tests will determine whether the research instrument can be declared valid before it can finally proceed to the statistical test of the correlation coefficient with Spearman rank.

The data obtained from the questionnaire (google form) will be ordinal, therefore also the most appropriate correlation coefficient test used in this study is the correlation coefficient test using Spearman Rank. The ordinal scale itself is one type of measurement scale that shows the order or ranking between data, but does not provide information about the exact difference between these categories (Sugiyono, 2017). of satisfaction, perceptions, or preferences of respondents, which are expressed through multilevel choices such as "strongly agree", "agree", "neutral", "disagree", and "strongly disagree" in accordance with this study which uses a Likert scale to measure the answers of respondents. All statistical tests in this study were carried out using the SPSS version 27 program.

The hypotheses in this study are as follows; Alternative hypothesis (H1) = There is a relationship between the utilization of Chat GPT and students' critical thinking skills. While the null hypothesis (H0) = There is no relationship between the utilization of GPT Chat and students' thinking skills.

Results and Discussion

Fig 3. Normality test results using one sample kolmogorov-smirnov

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual	
N		126	
Normal Parameters ^{a,b}	Mean	.4128163	
	Std. Deviation	2.1886724	
Most Extreme Differences	Absolute	.078	
	Positive	.078	
	Negative	-.060	
Test Statistic		.078	
Asymp. Sig. (2-tailed) ^c		.057	
Monte Carlo Sig. (2-tailed) ^d	Sig.	.062	
	99% Confidence Interval	Lower Bound	.055
		Upper Bound	.068

Source : SPSS for windows version 27

The normality test conducted using the Kolmogorov-Smirnov method produces a statistical value of 0.078 and a significance of Asymp. Sig (2-tailed) significance of 0.057. Therefore, taking into account the decision-making criteria, the residual data can be considered normally distributed, because the Sig value. 0.057 is greater than 0.05.

Fig 4. Simple linear regression test results

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	491.138	1	491.138	100.663	<.001 ^b
	Residual	604.997	124	4.879		
Total		1096.135	125			

a. Dependent Variable: Daya Kritis Mahasiswa
 b. Predictors: (Constant), Penggunaan Chat GPT

Source : SPSS for windows version 27

The results of the simple linear regression analysis show that the significance value is less than 0.001, which means it is smaller than 0.05. Thus, the null hypothesis (H0) was rejected, indicating a statistically significant influence between the use of Chat GPT and students' critical thinking skills. In addition, the F value of 100.663 confirms that the applied regression model as a whole is reliable for predicting the dependent variable.

Fig 5. The results of the correlation coefficient test using Spearman Rank.

Correlations

Spearman's rho	Penggunaan Chat GPT	Correlation Coefficient	Penggunaan Chat GPT	Daya Kritis Mahasiswa
			1.000	.631**
		Sig. (2-tailed)		<.001
		N	126	126
	Daya Kritis Mahasiswa	Correlation Coefficient	.631**	1.000
		Sig. (2-tailed)	<.001	
		N	126	126

** Correlation is significant at the 0.01 level (2-tailed).

Sumber : SPSS windows version 27

In this study, the authors have conducted a reliability test and validity test and the results of the research instruments can be declared reliable and valid for further correlation coefficient tests using the SPSS version 27 program. The analysis results obtained state that there is a significant relationship between Chat GPT utilization and students' critical thinking skills, which is indicated by a significance value of 0.001 which is below the 0.05 threshold. This means that the alternative hypothesis (H1) is accepted, while the null hypothesis (H0) is rejected. This finding supports the view (Sugiyono, 2017) that the Spearman Rank test is effective for seeing the direction and strength of the relationship between variables.

The strength of the relationship between the Chat GPT utilization variable (X) and the critical thinking ability of students (Y) is taken based on the correlation coefficient interpretation guidelines below:

Table 1. Pedoman Interpretasi koefisien korelasi

Interval Koefisien	Relationship Level
0,00 – 0,199	Very Low
0,20 – 0,399	Low
0,40 – 0,599	Medium
0,60 – 0,799	Strong
0,80 – 1,000	Very Strong

Source : Sugiyono 2017

Based on the results of the calculation of the correlation coefficient of 0.631, it can be concluded that the level of relationship between the two main variables in this study, namely the utilization of Chat GPT and students' critical thinking skills, is included in the strong category. This analysis was carried out using the Spearman Rank correlation technique through the help of SPSS version 27 software, which allows researchers to obtain a quantitative picture of the relationship pattern between the two variables studied.

These results indicate that the more optimized and directed students are in using Chat GPT both in terms of how often they access the platform, the type of information or content they are looking for, to the level of involvement or personal closeness to the use of this media, the higher the critical thinking skills they show in the academic context. In other words, the use of artificial intelligence-based technology such as Chat GPT has the potential to be a constructive tool in developing analytical and reflective thinking among students, provided that its use is done intelligently and responsibly.

This finding also strengthens the concept in the Uses and Effects theory proposed by Sven Windahl, which explains that media is not used indiscriminately, but based on the specific needs of its users. Furthermore, this theory also asserts that media use has a real impact on individual behavior or mindset (Rohim, 2009)). In the context of this study, students who use Chat GPT to fulfill certain academic needs indirectly also develop their critical thinking skills as a result of the interaction process with the content and information they access.

Discussion

The results of this study indicate that there is a significant and positive relationship between the utilization of ChatGPT and the critical thinking skills of Communication Science students at Singaperbangsa University of Karawang. The correlation coefficient value of 0.631 indicates a strong level of relationship, while the significance value of 0.001 (p < 0.05) indicates that this relationship is statistically significant. This finding affirms the alternative hypothesis (H1), which states that there is a relationship between the intensity of using ChatGPT and students' critical thinking skills.

This result confirms that the use of ChatGPT, if done in a purposeful and reflective manner, has the potential to strengthen students' critical thinking skills. This supports the view that AI technologies such as ChatGPT do not merely make students passive, but can actually be a tool for thinking, especially if used to dig for information, test arguments, and compare perspectives.

This is in line with the Uses and Effect theory used as a framework in this study, which states that individuals actively select media based on their needs, and the media then have an effect on the user's behavior or cognitive processes Windahl in (Rohim, 2009). In this context, students who actively utilized ChatGPT to seek a deeper understanding of the course material showed development in their critical thinking skills.

While the relationship found is positive, these results also need to be viewed in a broader context. Over-reliance on AI remains a concern. The use of ChatGPT without an understanding of digital literacy may cause students to become passive users, simply receiving information without evaluating or criticizing it. Therefore, the results of this study underscore the importance of digital literacy as a support in the optimal utilization of AI technology.

Digital literacy acts as a cognitive filter (Gilster, 1997), which helps students evaluate the validity, relevance, and accuracy of

information obtained through ChatGPT. This strengthens the argument that the successful utilization of AI in the academic world is not only determined by how often the technology is used, but also by the quality of user interaction with the technology.

The context of students who are in their final semester and preparing a thesis is also an important factor in the results of this study. Final-year students tend to have more in-depth and critical information needs, which encourages them to use technologies such as ChatGPT more strategically and analytically. Therefore, the positive correlation between ChatGPT and critical thinking may also be influenced by the academic phase the respondents are in.

This indicates that technology utilization does not stand alone, but is strongly influenced by the context of use, user needs, and individual metacognitive abilities in filtering and analyzing information. Thus, ChatGPT can be considered as a cognitive support rather than a substitute for the thinking process.

These findings have important practical implications for curriculum development in higher education. Lecturers and educational institutions need to consider integrating AI technologies such as ChatGPT into the learning process, with an emphasis on strengthening critical thinking and digital literacy. Technology-based learning strategies should be designed to encourage students to think analytically, not just consume information.

The use of AI needs to be balanced with training on how to ask good questions, critically evaluate answers, and relate information from ChatGPT to students' existing conceptual knowledge. That way, AI can act as a constructive learning tool, not an instrument that undermines independent thinking.

Limitation Of The Study

This study has several limitations that need to be considered in interpreting the results. First, the scope of the study was limited to students of the Communication Studies Program of Singaperbangsa University of Karawang class of 2021 who are in their final semester, so the results of the study cannot be generalized to student populations from other study programs, other universities, or different educational levels. Second, the data collection method used a Likert scale-based questionnaire that is self-report, making it susceptible to subjective biases, such as social desirability bias, where respondents may answer based on what is considered correct or acceptable, rather than based on actual experience. Third, this study only reviewed three aspects of ChatGPT utilization, namely frequency of use, type of content accessed, and individual proximity to the media, without considering other variables that also have the potential to influence critical thinking skills, such as digital literacy level, learning style, academic environment, and motivational factors. Fourth, the correlational nature of the research design does not allow researchers to draw direct cause-and-effect conclusions between the use of ChatGPT and an increase or decrease in critical thinking skills. In other words, although a significant relationship was found, it does not necessarily mean that the use of ChatGPT is the main cause of changes in critical thinking skills. Lastly, since the study was conducted in the context of a specific time (cross-sectional), the results may not reflect long-term dynamics, especially given that technologies such as ChatGPT are constantly undergoing updates and feature changes that may affect the way users interact with it in the future.

Conclusions and Recommendations

Based on the results of data analysis and discussion that has been carried out, it can be concluded that there is a significant and positive relationship between the utilization of ChatGPT and the critical thinking ability of Communication Science students at Singaperbangsa University of Karawang. The simple linear regression test results show a significance value of 0.001 (<0.05) and a correlation coefficient value of 0.631 which is included in the strong category. This finding shows that the higher the intensity and quality of ChatGPT utilization by students, the

higher the level of critical thinking skills they have. This reinforces the view that artificial intelligence-based technology such as ChatGPT, if used wisely and reflectively, can be a constructive tool in developing higher order thinking skills. This research also reinforces the relevance of Uses and Effect theory, where media are not only actively selected by individuals, but also have a real influence on the mindset and behavior of users.

Based on the above conclusions, there are several recommendations that can be proposed for future development. First, higher education institutions should start integrating the use of AI technologies such as ChatGPT into the learning curriculum, emphasizing aspects of digital literacy and critical thinking skills. Lecturers are also expected to guide students in using AI ethically and analytically, not only as a tool for assignments, but also as a means of intellectual exploration and reflection. Second, students need to be encouraged not only to be passive consumers of information, but to develop a critical attitude in evaluating any information obtained from ChatGPT or other digital sources. Third, for future research, it is suggested that the scope be expanded to other study programs and universities, as well as considering additional variables such as digital literacy, learning motivation, and student cognitive strategies. In addition, a longitudinal or mixed methods approach could be used to gain a deeper understanding of the dynamics of long-term AI use on the development of students' critical thinking.

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