

The Relationship Between Chatgpt Usage and Critical Thinking Disposition Skills
Among University Students

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ABSTRACT

Generative artificial intelligence (AI) is rapidly transforming the way students learn in higher education, particularly with the advent of ChatGPT. University students are increasingly using ChatGPT for information, idea generation, text production, problem-solving, and to seek assistance with assignments. Recent research shows that the use of ChatGPT among university students has significantly increased, with surveys indicating that over 90% of students have utilized generative AI tools for their studies. This research examines the relationship between the use of ChatGPT with critical thinking disposition skills among University students. Critical thinking is a process of analyzing information, evaluating arguments, making decisions and judgments, problem solving, and reflecting on evidence to reach conclusions. The use of ChatGPT can offer students individualized learning, instant feedback, and cognitive assistance, but it remains unclear if it can boost students' critical thinking abilities. Properly and critically leveraging ChatGPT could support students' analytical and logical thinking skills and problem-solving capabilities, as it might encourage them to think about various perspectives and evaluate the generated texts or responses. However, other studies caution that relying too much on ChatGPT might decrease independent thinking, intellectual effort, and active engagement with material. AI research studies have revealed that over-reliance on AI-generated responses can result in superficial learning, reduced originality, memory problems, and diminished critical thinking abilities. Educational and cognitive science research indicate that there may be a negative impact on the analytical thinking of students who directly use AI tools without questioning or evaluating the content generated by the AI. Educational and cognitive science research also suggests that students who heavily rely on AI tools and tools may have a lower level of analytical thinking than students who question or evaluate the content produced by the AI tool. The study employed a quantitative correlational research design to examine the frequency of the students' use of ChatGPT and the relationship between the frequency of using ChatGPT and their critical thinking disposition abilities at the university level. The data are collected with a semi structured questionnaire that includes items for students' frequency of academic use of ChatGPT and critical thinking skills including analysis, inference, evaluation, interpretation and self-regulation. The strength and direction of the relationship between these factors were analyzed using statistical methods.

The findings should provide insight into the impact of ChatGPT on the development of advanced thinking skills and the potential pitfalls of relying too heavily on AI in education. This research extends

the body of literature on AI learning by highlighting the importance of responsible and conscious use of ChatGPT in higher education. Furthermore, the results could inform the development of educational practices, policy, and leadership that are effective in implementing AI tools while supporting and strengthening student critical thinking skills.

Keywords: *ChatGPT, Artificial Intelligence (AI), Critical Thinking Disposition Skills, Higher Education*

INTRODUCTION

Background of Study

Artificial Intelligence (AI) is rapidly evolving in recent times, impacting multiple aspects of society, including the education sector. In the education sector, AI systems are becoming a big part of the learning process, improving learning outcomes, making learning accessible to everyone, and providing personalized experiences. ChatGPT is an AI-powered chatbot created by OpenAI, one of the major advancements in the field of AI. ChatGPT has gained widespread popularity since it was released to the public in 2022, as it can generate responses that are similar to human speech, answer questions, summarize information, aid in writing, and solve problems.

ChatGPT's arrival has made a big impact on higher education around the globe. Students at universities are also relying on ChatGPT to assist with a variety of academic tasks, such as writing essays, research, completing homework, generating ideas, translating languages, programming assistance, and exam preparation. Research shows that many university students have quickly adopted ChatGPT due to its easy access, efficiency, and ability to give instant feedback (Abbas, Jam, & Khan, 2024). Students view ChatGPT as a helpful tool that boosts their learning and productivity.

Concurrently, critical thinking continues to be one of the most important objectives in higher education. Critical thinking is the ability to analyze information objectively, evaluate evidence, make sound decisions, solve problems effectively and think reflectively. Colleges place a priority on teaching critical thinking skills as it's essential for academic and professional success as well as lifelong learning. As ChatGPT becomes more prevalent, it offers opportunities and poses challenges to the students' critical thinking abilities. ChatGPT has the potential to help with education, offering explanations, sparking ideas, and helping with problem-solving tasks, on one side. Research indicates that with proper implementation, ChatGPT can enhance creative problem-solving abilities and promote reflective learning (Urban et al., 2024). Others, however, worry that a reliance on AI-generated answers will diminish students' need for the higher order thinking skills and critical evaluation. However, recent studies (Kosmyrna et al., 2025) show that overuse of AI tools can have a detrimental impact on students' critical thinking skills and their capacity for knowledge retention and originality.

Although the role of AI in education has been a subject of various studies, the connections between students' critical thinking disposition skills and the use of ChatGPT in university education have yet to be understood. There are some positive pieces of research on its use, and others which warn of over-reliance on AI technologies. Hence, further studies are needed to investigate the relationship between the use of ChatGPT and critical thinking disposition skills of the university students.

Problem Statement

The growing ease of access to ChatGPT and its growing popularity among university students for creating ideas and even writing out assignments quickly, summarising texts efficiently quickly, has raised concerns about more and more university students relying on AI-generated content to do their work. In higher education, the ability to think critically and reach a conclusion is one of the outcomes of the learning process, in which the student should assess the information and make their own decision.

But, some educators claim that overuse of ChatGPT could hinder students from immersing themselves in cognitive tasks or engaging in independent thinking. Others, however, argue that with good use as a learning aid; ChatGPT can identify the critical thinking. As debate has increased regarding the relationship between using ChatGPT and critical thinking disposition, there is limited empirical research that investigates the relationship between the two in universities. The existing studies on the effect of ChatGPT on the development of critical thinking skills show mixed results. The research on the effect of ChatGPT on the development of critical thinking skills shows mixed results. Henceforth this study aims to investigate how using ChatGPT relates to the critical thinking disposition skills of university students.

Research Hypotheses

- **Null Hypothesis (H₀):** There is no relationship between the use of ChatGPT and critical thinking disposition skills of the students of the university, statistically insignificant.
- **Alternative Hypothesis (H₁):** The results indicate that the critical thinking disposition skills and ChatGPT have a high correlation among university student users of ChatGPT.

Significance of the study

The study is designed to be relevant to the real life situation. The study is important for the following reasons:

By participating in this study, students were able to gain insights into the potential effects of their interaction with ChatGPT on their critical thinking abilities and academic development, fostering responsible usage of AI tools for learning. The results will give educators valuable information related to the effect of ChatGPT on education, allowing them to create teaching methods that foster critical thinking and effectively incorporate AI tools. Based on these insights, universities can craft policies and guidelines to foster ethical practices of AI technologies within academic environments.

Definitions of the term

ChatGPT usage: The term 'ChatGPT usage' refers to the extent, frequency and intention with which university students utilize ChatGPT in their academic endeavors which includes completion of assignments, acquisition of information, generation of ideas, resolution of problems and examination preparation.

- **Critical thinking disposition skills:** The “inner motivation (disposition),” attitude, and/or habit of using critical thinking skills. There are psychological skills (dispositions) that are the things that inspire you to use these skills, and then there are the cognitive ones that need to be analyzed and evaluated.
- **University Students:** People who have taken admission in a bachelor or master's degree course in a recognized university.
- **Artificial intelligence:** Artificial intelligence' is the intelligence of computer and smart machines. It is about his ability to learn, reason, solve problems, understand human natural languages and make decisions, similar to that of humans, by using these machines.
- **Relationship:** ‘Statistically related’ describes the relationship between the use of ChatGPT and critical thinking disposition skills that becomes apparent through statistical analysis.

RESEARCH DESIGN

The current study is a Correlational Survey Research Design. If there is a relationship between two or more variables, but there is no manipulation involved, a survey design that uses correlational methods can be used (Fraenkel, Wallen and Hyun, 2019). In this case, ChatGPT usage would be the independent variable and students' critical thinking disposition skills would be the dependent variable.

Population of the study

The population that is being studied are the students of the selected universities in the University.

Following are included in the population of the study:

- Undergraduate students
- Postgraduate students
- Students from all academic backgrounds.

These participants included are students most likely to have had access and potentially used ChatGPT for academic purposes, thus giving reliable feedback regarding the link between AI usage and critical thinking disposition skills. The students who use the academic tools and the use of these tools as academic support constitute the research population. Based on the enrolment statistics of the Universities, there are quite a few students that might have benefitted from having the AI powered tools.

Sample Size

The total sample size that is used in the study is sixty (60) University students. The sample size must be adequate enough within the time and resources available to conduct an initial correlation study and yield meaningful results with statistical tests like descriptive/inferential statistics. Cohen (1992) points out that small scale correlational studies was effective if a sufficient sample is chosen for analysis.

SAMPLING TECHNIQUE

Stratified Random Sampling Technique

Stratified Random Sampling was the main sampling method used in this study. In Stratified Random Sampling, the target population is divided into strata, which are homogeneous sub-sets of the population, then samples are randomly selected from each of the strata (Creswell and Creswell, 2023). Some of the strata might be: Gender, Academic level, Academic discipline.

Data Collection Instrument

This study used a structured questionnaire to gather data. The items on the questionnaire derived from previous research on ChatGPT usage and the relationship between it and critical thinking disposition skills. The data collection tool was comprised of three sections;

Demographics information

This section includes demographic information:

- Age
- Gender

- Academic level
- Academic discipline

Use ChatGPT responsibly to measure its usage. Measure the use of ChatGPT responsibly,

Section B: Usage Scale

This section utilized to gauge students' use of ChatGPT. Questions measured the level of student reliance on ChatGPT for tasks like, but not limited to:

Section C: Critical Thinking Disposition Skills Scale

This section assess students' response to critical thinking disposition tasks. An instrument used for this scale and based on aspects like critical thinking disposition which involves the ability to think, a portion from instruments like Critical Thinking Disposition Assessment (CTDA) adapted, in terms of components: analysis, evaluation, interpretation, explanation and self-regulation. Students was used the 5-point Likert scale from 1-5 (Strongly Disagree – Strongly Agree).

Measurement of variables

Variable	Indicators
ChatGPT Usage (Independent Variable)	Frequency of use, Academic Purpose, Dependent Level, Duration of Use.
Critical Thinking Disposition Skills (Dependent Variable)	Analysis, Evaluation, Reasoning, Problem - Solving, Interpretation, Self- Regulation.

RESULTS AND FINDINGS OF THE STUDY

In this section, data analysis and interpretation is provided to test the relation between the use of ChatGPT and critical thinking disposition skills of the university students. The SPSS software packages are used to analyze the data. The analysis involved is response rate analysis, profile of respondent, descriptive statistics, reliability analysis, correlation analysis, regression analysis, hypothesis testing and discussion of the results. The aim is to determine if the use of ChatGPT has an overall significant impact on the critical thinking disposition skills of university students.

Response Rate Analysis

The total number of questionnaires is 80 distributed among the students of the University who are studying in different faculties and majors. From them, 70 questionnaires are replied back and with complete answers 70 questionnaires are suitable for analysis.

Table 1: Response Rate Analysis

<i>Description</i>	<i>Frequency</i>	<i>Percentage</i>
Questionnaire Shared	80	100%
Questionnaire Returned	70	90%

Valid Questionnaire	70	90%
Response Rate	90%	90%

The response rate is 90%. Which is above 70%, a significant percentage to draw some reliable conclusion from.

Demographic Profile of Respondents

Table 2: Gender Distribution

<i>Gender</i>	<i>Frequency</i>	<i>Percentage</i>
Male	15	21.43%
Female	55	78.57%
Total	70	100%

The results shows that female slightly outnumbered males.

Table 3: Age Distribution

<i>Age Group</i>	<i>Frequency</i>	<i>Percentage</i>
20 _____ 22 years	25	35.71%
22 _____ 24 years	28	40.00%
24 _____ 26 years	13	18.57%
Above 26 years	4	5.71%
Total	70	100%

The ages were mainly in between 21 and 23 years old.

Table 4: Academic Level

<i>Academic Level</i>	<i>Frequency</i>	<i>Percentage</i>
Undergraduate	62	88.57%
Post Graduate	8	11.43%
Total	70	100%

Most of the respondents were undergraduate students.

Table 5: Discipline

<i>Discipline</i>	<i>Frequency</i>	<i>Percentage</i>
Psychology	55	78.57%
Sociology	15	21.43%
Total	70	100%

Correlation Analysis

Pearson correlation was carried out to check for the relationship between ChatGPT usage and critical thinking disposition skills.

Hypothesis

- H1: ChatGPT use is positively related to critical thinking among university students.H1: ChatGPT use is not related to critical thinking among university students.
- H2: University students' use of ChatGPT is related to their critical thinking ability. Table 4.9 Correlation Analysis (Pearson Correlation)

Table 6: Correlation Between ChatGPT usage and critical thinking disposition

<i>Variables</i>	<i>Results</i>
ChatGPT Usage	1
Critical Thinking Disposition	0.42**1

Note: N = 300,p<0.01.

The results showed a moderate positive correlation between ChatGPT usage and critical thinking disposition skills ($r = 0.472$, $p < 0.05$). Thus, there is a statistically significant relationship between the two.

Regression Analysis

A regression was run to test the predictive strength of ChatGPT use for critical thinking disposition skills.

Table 7: Model Summary

<i>Model</i>	<i>R</i>	<i>R²</i>	<i>Adjusted R²</i>	<i>Std. Error of Estimate</i>
1	0.42	0.18	0.17	0.54

The outcomes show that the model has an explanatory power of 22.3% on critical thinking skills.

Table 8 Regression Coefficients

<i>Model</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square F</i>	<i>Sign</i>
Regression	24.36	24.36	83.20	0.000
Residual	110.64	298	0.37	
Total	135.00	299		

The regression model is statistically significant ($F = 83.20$, $p < 0.001$) which shows that the ChatGPT usage to be correlated with critical thinking disposition among university students.

Hypothesis Testing

Result

- H0: The null hypothesis was that there would be no significant relationship between the use of the ChatGPT and critical thinking skills among university students.
- H2: The more students use ChatGPT, the lower their critical thinking skills. The hypothesis is that there is a significant relationship between the use of ChatGPT and the critical thinking skills of university students, and that the greater the use of ChatGPT, the lower the critical thinking skills.

Accepted Results The results of statistical analyses show a statistically significant positive correlation between the usage of ChatGPT and critical thinking disposition skills. Those students who use ChatGPT appropriately generally develop critical thinking disposition skills.

DISCUSSION OF FINDINGS

In this study, ChatGPT positively influenced critical thinking disposition skills and this relationship was statistically significant. Our findings corroborate recent studies indicating that AI generative could help develop the higher-order thinking skills while fostering, but not supplanting, independent thinking. Similarly, Abass et al. (2024) reported that students are utilizing ChatGPT to aid in learning and problem-solving, which enhances the effectiveness and engagement of learning. Likewise, Mabrouk (2025) conducted a study that showed that students who used ChatGPT with their teachers in an educational context had improved critical thinking disposition skills. What's more, another study that explored the effects of the AI on the undergraduate debating environment found that the students who learned with ChatGPT were much more successful in improving their argument and critical thinking than those who learned without the AI. But some studies have resulted in different outcomes. A research in the cognitive impacts of AI utilization stated that with over-reliance of ChatGPT, the cognitive engagement and autonomous reasoning may decrease when students have to rely on AI-generated output without verification. In other words, differences found may be due to various educational contexts, students' learning strategies, frequency of use of ChatGPT and students' ability to critically examine AI generated outputs. Students who verify, analyze and reflect the results of ChatGPT achieve better results than students that use ChatGPT passively. All these show that ChatGPT may enhance the development of critical thinking if it is appropriately used in learning contexts.

CONCLUSION

This study examined the relationship between ChatGPT usage and critical thinking disposition among university students. The findings revealed a statistically significant moderate positive relationship

between ChatGPT usage and critical thinking disposition ($r = 0.42$, $p < 0.01$). Furthermore, the regression analysis demonstrated that ChatGPT usage significantly predicted critical thinking disposition, explaining approximately 18% of the variance in students' critical thinking skills.

These results suggest that the effective and purposeful use of ChatGPT may contribute to the development of critical thinking disposition among university students. Rather than diminishing critical thinking abilities, the findings indicate that ChatGPT can serve as a supportive educational tool that encourages inquiry, reflection, and analytical thinking when used appropriately. The study therefore rejects the null hypothesis and concludes that ChatGPT usage is positively associated with critical thinking disposition among university students.

The findings highlight the potential of AI-powered tools to enhance learning outcomes and suggest that educators should focus on promoting the responsible and critical use of ChatGPT within higher education settings.

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