ETDC Indonesian Journal of Research and Educational Review
Volume 5, No. 1, 2025, pp 731 - 745

e–ISSN 2809-3682
p–ISSN 2809-7505

https://doi.org/10.51574/ijrer.v5i1.4531

Evaluation of the Use of ChatGPT in Online Discussions: Its Impact on Student Understanding of Material and Interaction

Fadli Firdaus[1] Mia Syafrina[2]
[1] Department of Electrical Engineering, Politeknik Negeri Batam, Indonesia
[2] Department of Business Management, Politeknik Negeri Batam, Indonesia

Article Info

Article history:

Received October 05, 2025
Accepted December 13, 2025
Published December 27, 2025

Keywords:

AI Dependence;
ChatGPT;
Material Understanding;
Online Discussion;
Student Interaction.

ABSTRACT

The rapid incorporation of artificial intelligence, notably ChatGPT, in online learning settings has raised questions about its impact on pedagogy. It is unclear whether AI use intensity inherently improves interaction quality and student pleasure or if other cognitive aspects like material knowledge are more important. This study analyzes two models—student interaction quality and student satisfaction—to assess ChatGPT's multifunctional role in online conversations. This quantitative study examines ChatGPT usage intensity, AI dependency, content understanding, interaction quality, and student happiness using structural models. The mechatronics program at Batam State Polytechnic collected data from students using AI techniques in online discussion forums. The findings indicated that the most consistent and dominant predictor of interaction quality and satisfaction is material understanding. ChatGPT intensity and content understanding promote interaction quality in Model 1, demonstrating its procedural support role. Model 2 demonstrates that student satisfaction is more influenced by material understanding and tool trust (dependence) than frequency of usage, suggesting that satisfaction is subjective and effective. The study reveals that AI integration alone does not guarantee success; pupils' cognitive competence and AI adaptation play a significant role. AI's procedural and affective effects on learning are distinguished in this educational technology study. It assists educators in positioning ChatGPT as a "thinking partner" instead of a quick fix. It suggests that pedagogical focus must remain on strengthening students' foundational grasp of concepts before introducing AI tools to ensure high-quality, sustainable online discourse.

Corresponding Author:

Fadli Firdaus,
Department of Electrical Engineering, Politeknik Negeri Batam, Indonesia
Email: fadlifirdaus@polibatam.ac.id

1. INTRODUCTION

Education in the digital age has progressed swiftly, propelled by technological advancements that have altered our methods of accessing information, interacting, and learning (Saykılı, 2019). A prevalent technical advancement in education is the implementation of Artificial Intelligence (AI) (Alabi et al., 2025; Owoc et al., 2019;

Raheef & Olayiwola, 2025). In the realm of higher education, AI possesses significant potential to improve relationships between educators and students, enhance comprehension of content, and foster more successful learning experiences (Fatmadiwi et al., 2025). Diverse educational contexts increasingly utilize ChatGPT, an OpenAI-created Natural Language Processing (NLP) model. ChatGPT, as an AI-driven tool, facilitates text-based interactions between students and technology, offering immediate responses, comprehensive explanations, and enhanced support for discussion-based learning (Garasut et al., 2024).

Numerous research studies have indicated that AI may serve as a debate facilitator, offering prompt feedback and promoting active learning (Pahi et al., 2024; Papaneophytou & Nicolaou, 2025). ChatGPT, being the most recent advancement in artificial intelligence, presents significant potential for facilitating discussion-based learning (Lee et al., 2024). Numerous recent studies indicate that the implementation of AI in education can enhance student engagement and facilitate a deeper comprehension of the topic. Research by Ba et al. (2025) indicates that AI, such as ChatGPT, enhances student engagement in online debates by delivering prompt and comprehensive answers to inquiries. The result enhances material understanding and enables students to inquire more freely, without temporal limitations. Moreover, the application of AI in online education enables students to obtain more timely and pertinent feedback, thereby enhancing the quality of learning (Hooda et al., 2022; Cheah, 2021).

Despite extensive research on the impact of AI technology on education, there has been limited focus on the application of ChatGPT in online discussions within general higher education courses. Most of the current research concentrates on AI applications in language instruction or task-oriented learning environments (Ouyang et al., 2022). Moreover, investigations into the application of ChatGPT in expansive learning contexts, especially within academic discourse in higher education, are still scarce. Therefore, we need to address a gap in literature to better understand ChatGPT's effectiveness in enhancing discussion-based learning.

Students' struggle to pose questions or fully comprehend the content is a primary obstacle in online discussions. In text-based discussions, students frequently feel constrained in articulating their thoughts or receiving the prompt response they require. ChatGPT, with its capacity for automatic responses and clearer explanations, may serve as a solution to this issue. Its application in online conversations is anticipated to enhance subject comprehension and facilitate greater student engagement (Fathony et al., 2024).

While numerous studies demonstrate the benefits of AI technology in education, there is a scarcity of research specifically analyzing the role of ChatGPT in enhancing academic discourse in higher education. Current research predominantly investigates AI within task-based learning or in courses primarily centered on language instruction (Krystalli & Arvanitis, 2025). In the study conducted by Susmita (2024), the emphasis is predominantly on broad applications of technology in education, while it neglects the special function of models like ChatGPT in academic interactions.

Consequently, there exists a gap that necessitates exploration: a more profound comprehension of how ChatGPT enhances online conversations in general courses, specifically with the augmentation of student engagement and comprehension. This study examines the influence of ChatGPT utilization on the quality of student interactions and comprehension while also investigating students' experiences during online discussions. Current research in higher education predominantly emphasizes certain contexts, such as language acquisition, indicating that academic discourse in general courses requires further enhancement (Baskara et al., 2023). In online discussion-based learning, students frequently encounter difficulties in structuring thoughts, comprehending intricate content, and sustaining fluid discussions. Technical limitations, including network quality, frequently affect participation and the enjoyment of learning (Herlina, 2021). ChatGPT is advantageous since it allows students to seek re-explanations, conceptual clarifications, and prompt responses during conversations, hence reducing dependence on the reaction time of lecturers or peers.

Although it shows great promise for improving engagement and comprehension, researchers have not thoroughly investigated the application of ChatGPT in online conversations within general courses. This study aims to investigate students' experiences with ChatGPT in online discussions, assess its impact on student engagement and comprehension, analyze the challenges faced in interacting with ChatGPT and the strategies implemented to overcome them, and provide recommendations for improving the effectiveness of ChatGPT in promoting academic discourse in higher education.

A quantitative approach employing an explanatory design will be utilized to accomplish this study purpose. This study will include students from three distinct classrooms utilizing ChatGPT in their online chats. Comprehensive interviews and observations of online discussions will be employed to investigate students' experiences with ChatGPT and assess its influence on the quality of interactions and comprehension of the topic. This method is anticipated to yield profound insights into the capacity of ChatGPT to augment discussion-based learning in higher education.

2. METHOD

This study employed a quantitative approach with an explanatory design to test causal relationships between variables using measurable empirical data and statistical analysis (Creswell & Creswell, 2017). The aim was to analyze the effect of using ChatGPT in online discussions on material comprehension, the quality of student interactions, and online discussion satisfaction. This approach was chosen because it allows testing causal relationships between variables based on measurable empirical data.

The study population was university students who had participated in online discussion-based learning and had experience using ChatGPT as an academic tool. This research was conducted on students of the mechatronics study program, Batam State Polytechnic. The sampling technique used purposive sampling, with the following criteria:

(1) active students,
(2) having participated in online learning discussions, and
(3) having used ChatGPT in a learning context.

The sample size was determined based on the needs of the regression analysis, which was at least 5–10 times the number of independent variables being analyzed.

Data was collected using a closed-ended questionnaire distributed online via Google Forms. The research instrument was developed based on variable indicators developed from theoretical studies and previous research. All statement items were measured using a 1–4 Likert scale, with categories ranging from 1 = strongly disagree to 4 = strongly agree. The use of an even scale was intended to reduce bias in respondents' neutral responses. The research variables consist of:

1. Use of ChatGPT in Online Discussions (X1), Material Understanding (X2), and Dependence on ChatGPT (X3) as independent variables,
2. Quality of Student Interaction (Y1) and Satisfaction with Online Discussions (Y2) as dependent variables.

The value of each variable is obtained from the average score of items that meet the validity and reliability criteria. The instrument's validity was tested using Pearson Product Moment correlation, with the criterion of calculated r > table r at a significance level of 0.05. Reliability testing was performed using Cronbach's Alpha, with a value ≥ 0.70 indicating an acceptable level of reliability. The next, hypothesis testing was conducted at a significance level of $\alpha = 0.05$, using the t-test for partial effects, the F-test for simultaneous effects, and the coefficient of determination (R^2) to measure the model's ability to explain the dependent variable. Hypothesis testing was conducted using simple and multiple linear regression analysis, with the following models::

1. The influence of ChatGPT use, understanding of the material, and dependence on the quality of student interactions.
$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$
2. The influence of ChatGPT usage, understanding of the material, and dependence on online discussion satisfaction.
$$Y_2 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

3. RESULTS AND DISCUSSION

Results

Descriptive Statistics of Research Variables

Table 1. Descriptive Statistics Results

Variables	N	Minimum	Maximum	Mean	Std. Deviation
GPT Chat Usage	54	1.80	3.80	2.8074	48,675
Material Understanding	54	1.60	4.00	3.1974	50,799
Dependence	54	1.20	3.40	2.3074	44,078
Interaction Quality	54	1.00	3.60	2.4889	47,847

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Discussion Satisfaction	54	1.00	3.67	2.6346	56,976
Valid N (listwise)	54				

The descriptive statistical analysis utilizing a Likert scale of 1–4 indicated that the variable "use of ChatGPT in online discussions" attained a mean value of 2.8074, categorizing it as high. This research demonstrates that students actively employ ChatGPT in online discussions to comprehend subjects, formulate arguments, and enhance their confidence in participation. The standard deviation of 0.48675 signifies a minimal degree of variation in respondents' responses, reflecting a generally uniform assessment of ChatGPT's usage.

The variable "understanding of the material" exhibited an average value of 3.0074, categorizing it as high. This signifies that students demonstrated enhanced conceptual comprehension, clarity of information, and analytical abilities following their utilization of ChatGPT as a discussion instrument. The standard deviation of 0.50799 suggests that students' judgments of material comprehension were predominantly moderate.

The average value of 2.3074 for the variable "dependence on ChatGPT" classified it as moderate. This suggests that while ChatGPT aids online discussions, students have not attained a significant level of reliance. The standard deviation of 0.44078, which is comparatively lower than the other variables, signifies a lack of variation in the level of dependency among respondents.

The average value of student interaction quality was 2.4889, categorizing it as moderate to high. This finding suggests that the utilization of ChatGPT enhanced student participation and the caliber of contributions in online discussions, albeit the degree of influence varied among respondents. A standard deviation of 0.47847 signifies minimal fluctuation in student participation levels while utilizing ChatGPT in talks.

Simultaneously, the variable satisfaction with online chats exhibited an average value of 2.6346, categorizing it as high. This finding indicates that students are primarily satisfied with the quality of the processes and outcomes of online discussions facilitated by ChatGPT. The standard deviation of 0.56976 signifies that the satisfaction ratings of respondents are uniform.

Validity and Reliability Test Results

The validity assessment was performed via Pearson Product Moment correlation, with an r-table value of 0.268 ($\alpha = 0.05$; df = 52). The test results indicated that most statement items possessed estimated r-values exceeding the tabulated r-values, hence confirming their validity. Nevertheless, certain items, specifically Y1.3, X3.4, and X3.5, failed to satisfy the validity criteria and were hence omitted from subsequent analysis. Additionally, the instrument reliability test was conducted using Cronbach's Alpha. The test results showed that all research variables had Cronbach's Alpha values of $0.924 \geq 0.70$, thus the instrument was declared reliable and suitable for use in further analysis.

Classical Assumption Test Results

The histogram of the Standardized Residual Regression on the dependent variable, Interaction Quality, the residual distribution appears to form a pattern approaching a normal distribution. This is indicated by the relatively symmetrical shape of the histogram around the zero value and follows the normal curve shown in graph 1.

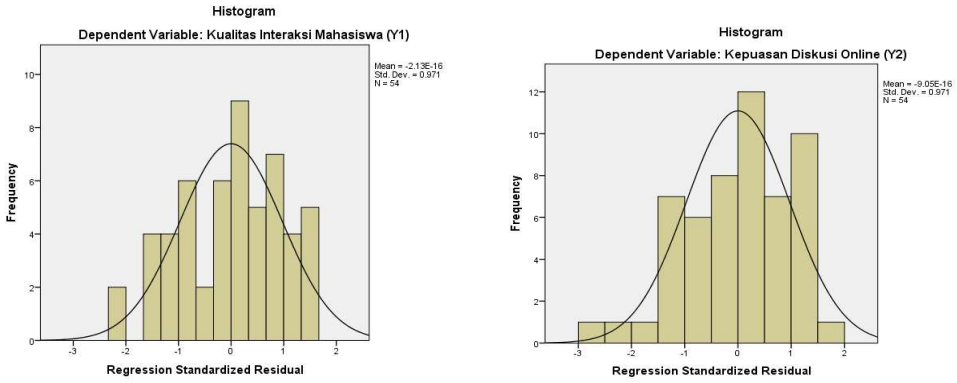

Figure 1. Histogram of the Standardized Residual Regression

The mean residual values of -2.13E−16 and -9.05E, which are near zero, suggest an absence of systematic bias in the regression model. Additionally, the standard deviation of 0.971, approaching 1, shows that the residual distribution is within acceptable bounds. A sample size of 54 observations is deemed sufficient for assessing the normality of residuals in regression analysis.

Visually, there are no significant aberrations, such as pronounced skewness or overly sharp peaks in the distribution (severe kurtosis). Consequently, it can be inferred that the assumption of normality of residuals in the regression model is satisfied, rendering the regression model appropriate for subsequent hypothesis testing. This aligns with the findings of the Normal P–P Plot of Regression Standardized Residuals about the dependent variable Interaction Quality.

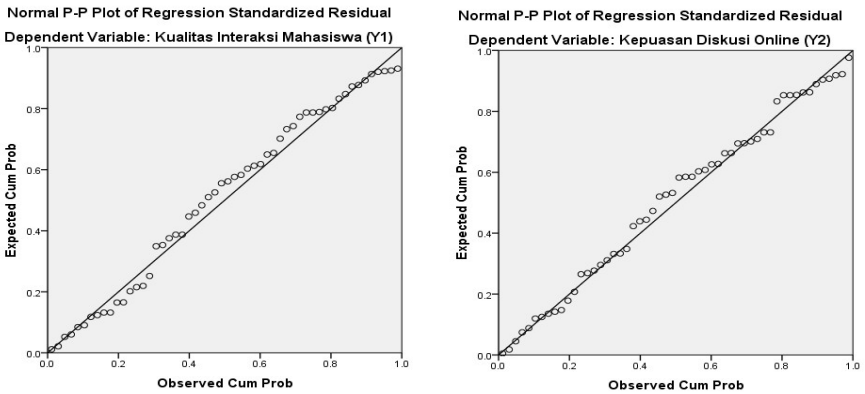

Figure 2. Plot P–P Normal dari Regresi Residual Terstandarisasi

The normalized residual points are distributed around the diagonal line, exhibiting only slight deviations in some regions. This pattern signifies that the residual distribution converges to a normal distribution. The Kolmogorov–Smirnov test yielded

a significance value of 0.200 (>0.05), signifying that the residuals are normally distributed and the normality assumption is satisfied.

Multicollinearity Test

Table 2. Multicollinearity Test Results

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	Tolerance	VIF
(Constant)	-1,080	1,183		-913	366		
ChatGPT Usage (X1)	303	100	340	3,036	4	562	1,779
Material Understanding (X2)	384	99	450	3,871	0	522	1,917
Dependence (X3)	192	114	159	1,684	98	789	1,267

The multicollinearity test findings demonstrate that all independent variables in the regression model possess tolerance values exceeding 0.10 and a Variance Inflation Factor (VIF) below 10. The variable "Use of ChatGPT in Online Discussions" has a tolerance value of 0.562 and a VIF of 1.779; the variable "Understanding the Material" has a tolerance value of 0.522 and a VIF of 1.917; and the variable "Dependence on ChatGPT" shows a tolerance value of 0.789 and a VIF of 1.267.

These numbers suggest a lack of a robust linear correlation among the independent variables. Consequently, it may be inferred that the regression model is devoid of multicollinearity. The computed regression coefficients are consistent and may be accurately interpreted to elucidate the impact of each variable on the quality of student interactions and satisfaction.

Heteroscedasticity Test (scatterplot)

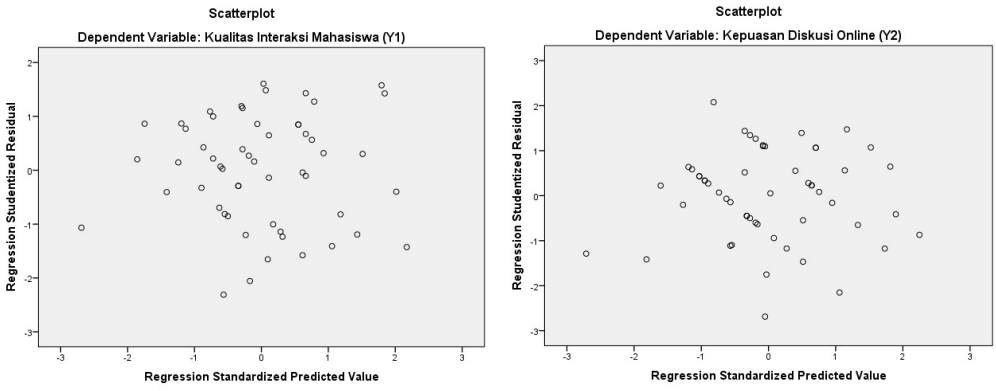

Figure 3. Scatterplot

The scatterplot of the Regression Studentized Residual and Regression Standardized Predicted Value on the dependent variable Student Interaction Quality (Y1) shows that the residual points spread randomly above and below the zero line without forming a curved or fan-like pattern. The linearity assumption in the regression model is met since

residuals are reasonably even over the expected value range, indicating no heteroscedasticity symptoms. Multiple points with large residual values are within tolerable bounds and do not suggest extreme outliers. To describe and forecast student interaction quality, the regression model is practicable and reliable. Also, Online Discussion Satisfaction (Y2) has residual points that extend randomly above and below the zero line without producing a curved or fan-like pattern.

Uji Heteroskedastisitas (GLEJSER)

Table 3. Heteroscedasticity Test Results (Model 1)

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	256	620		414	681
Use of ChatGPT (X1)	53	52	183	1,017	314
Understanding of Material (X2)	-32	52	-115	-617	540
Dependence (X3)	100	60	255	1,682	99

Table above, all variables have a significance level above 0.05, which means that the data does not show symptoms of heteroscedasticity or the heteroscedasticity assumption is met.

Table 4. Heteroscedasticity Test Results (Model 2)

Model	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	358	552		649	519
Use of ChatGPT (X1)	18	47	70	387	701
Understanding of Material (X2)	48	46	197	1,044	302
Dependence (X3)	-88	53	-253	-1,647	106

The same thing for model 2 also shows that all variables have a significance level above 0.05, which means that the data does not show symptoms of heteroscedasticity or the heteroscedasticity assumption is met.

Multiple Regression Analysis Model 1

F Test

Table 5. F Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	161,298	3	53,766	30,659	.000[b]
Residual	87,683	50	1,754		
Total	248,981	53			

If the significance value is below 0.05, the independent variable affects the dependent variable simultaneously. With a significant value of 0.000 (<0.05), "Use of ChatGPT in

Online Discussions," "Understanding the Material," and "Dependence on ChatGPT" all impact "Quality of Student Interaction."

Hypothesis Testing (t-Test)

Table 6. T-Test Results

Model	Variabel	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
1	(Constant)	-1,080	1,183		-913	366
	Using ChatGPT in Online Discussions (X1)	303	100	340	3,036	4
	Understanding the Material (X2)	384	99	450	3,871	0
	Dependence on ChatGPT (X3)	192	114	159	1,684	98

If the p-value is below 0.05, it is determined that the independent variable significantly influences the dependent variable. The ChatGPT Usage variable exhibits a significant value of 0.004 (<0.05), indicating that it significantly influences the Student Interaction Quality variable (H1 is accepted). The Material Understanding variable exhibits a significant value of 0.000 (<0.05), indicating that it significantly influences the Student Interaction Quality variable (H2 is accepted). The ChatGPT Dependent Variable has a significant value of 0.098 (>0.05), indicating that it does not significantly affect the Student Interaction Quality variable (H3 is rejected).

Regression Equation Model 1

Student Interaction Quality (Y1) will be -1.080 when ChatGPT Use in Online Discussions (X1), Material Understanding (X2), and Dependence on ChatGPT (X3) are zero. The X1 regression coefficient of 0.303 shows that each one-unit increase in ChatGPT utilization in online conversations improves student interaction by 0.303 units, assuming other factors remain constant. A one-unit increase in material understanding improves student interaction by 0.384 units, making it the most influential variable. The X3 coefficient of 0.192 shows a positive effect, however ChatGPT dependence does not significantly affect student interaction.

$$\boldsymbol{Y_1 = -1,08 + 0,303X_1 + 0,384X_2 + 0,192X_3}$$

Coefficient of Determination Model 1

Table 7. Results of Coefficient of Determination Model 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	805	648	627	132,426

The coefficient of determination (R Square) for the regression model, as indicated in Model Summary Table 7, was 0.648. This suggests that the variables of ChatGPT's usage in online discussions, comprehension of the topic, and dependence on ChatGPT collectively accounted for 64.8% of the variance in satisfaction with online

conversations. The regression model had substantial explanatory power, as over fifty percent of the variation in the dependent variable was accounted for by the independent variables within the model.

Multiple Regression Analysis Model 2

F Test

If the significance value is less than 0.05, then the independent variable has a significant effect simultaneously (together) on the dependent variable. The significance obtained is 0.000 (<0.05), so it can be concluded that the variables of ChatGPT Use in Online Discussions, Understanding of the Material, and Dependence on ChatGPT have a simultaneous (together) effect on the Online Discussion Satisfaction Variable.

Hypothesis Testing (t-Test)

If the significance value is less than 0.05, it is concluded that the independent variable has a significant effect on the dependent variable. The ChatGPT Usage variable has a significant value of 0.198 (>0.05), so it is concluded that the ChatGPT Usage variable does not have a significant effect on the Online Discussion Satisfaction variable (H4 is rejected). The Material Understanding variable has a significant value of 0.000 (<0.05), so it is concluded that the Material Understanding variable has a significant effect on the Online Discussion Satisfaction variable (H2 is accepted). The ChatGPT Dependent Variable has a significant value of 0.028 (>0.05), so it is concluded that the ChatGPT Dependent Variable does not have a significant effect on the Online Discussion Satisfaction variable (H3 is rejected).

Regression Equation Model 2

The equation shows that Online Discussion Satisfaction (Y2) will have a value of -2.16 when the Use of ChatGPT in Online Discussions (X1), Understanding of the Material (X2), and Dependence on ChatGPT (X3) are zero. The regression coefficient of the variable of use of ChatGPT in online discussions is positive at 0.108, which indicates that increasing the use of ChatGPT has the potential to increase satisfaction with online discussions, although this effect is not statistically significant. Meanwhile, understanding of the material has the largest regression coefficient, namely 0.362, which means that the higher the understanding of the material, the higher the satisfaction with online discussions, and this effect is proven to be statistically significant. In addition, dependence on ChatGPT also has a positive effect on satisfaction with online discussions with a coefficient of 0.214 and is statistically significant. Thus, it can be concluded that understanding of the material and dependence on ChatGPT are factors that play an important role in increasing satisfaction with online discussions, while the use of ChatGPT in online discussions has not shown a significant effect.

$$Y_2 = -2,16 + 0,108X_1 + 0,362X_2 + 0,214X_3$$

Coefficient of Determination

The coefficient of determination (R Square) for the regression model was 0.608. This indicates that the variables of ChatGPT use in online discussions, understanding of the material, and reliance on ChatGPT simultaneously explain 60.8% of the variation in satisfaction with online discussions. Thus, the regression model used has strong explanatory power because more than half of the variation in the dependent variable can be explained by the independent variables in the model.

Discussion

This study aims to analyze the effect of ChatGPT use on the quality of student interactions and satisfaction with online discussions, with material understanding and dependency as contributing factors.

Impact of ChatGPT on Student Interaction Quality (Model 1)

Based on the t-test results, it was found that ChatGPT Use (X1) and Material Understanding (X2) had a significant partial effect on Student Interaction Quality (Y1). Students actively used ChatGPT to develop arguments and understand complex discussion topics. This was reflected in the average ChatGPT usage score, which was in the "High" category (2.8074). Material understanding was the most dominant factor in improving interaction quality, with a regression coefficient of 0.384. This indicates that ChatGPT is most effective in improving discussion quality when the tool successfully helps students understand the material's substance in depth, rather than simply copying answers. Interestingly, Dependency on ChatGPT (X3) did not significantly affect interaction quality. This indicates that although students frequently use ChatGPT, the quality of their interactions is determined more by how well they understand the material than simply by their reliance on the tool.

The Impact of ChatGPT on Online Discussion Satisfaction (Model 2)

The results of the second model show a slightly different pattern regarding the factors influencing student satisfaction with online discussions. Like the first model, material understanding again had the largest influence on discussion satisfaction (coefficient 0.362). Students felt satisfied when the discussion process provided conceptual clarity and improved their analytical skills. Unlike interaction quality, Dependence on ChatGPT (X3) had a significant influence on discussion satisfaction. This indicates that for students, the ease offered by ChatGPT in facilitating discussions creates a sense of satisfaction, as the cognitive burden of searching for references or composing words is reduced. The independent variable of ChatGPT use (X1) did not significantly influence satisfaction. This suggests that satisfaction does not arise solely from "using" the tool, but rather from the "results" achieved, namely a better understanding of the material.

Classical Assumption Analysis and Model Feasibility

Methodologically, the results of this study have strong credibility because they meet various classical assumption tests. Data is normally distributed based on the

Kolmogorov-Smirnov test (p = 0.200) and the P-P plot visualization follows the diagonal line. No excessive linear relationships were found between the independent variables (VIF < 10), so the influence of each variable can be interpreted stably. The Glejser test showed no signs of heteroscedasticity, meaning the residual variance is constant or homogeneous.

These findings align with previous studies that suggest generative AI functions effectively as a personal tutor (Batsaikhan & Correia, 2024; Bonde, 2024; Thomas et al., 2024). Students who use AI to clarify difficult concepts tend to perform substantially better in discussions than those who simply use it to copy answers. These results demonstrate that increased understanding of material automatically improves the quality of arguments in online discussions.

Previous studies have often worried that reliance on AI will diminish critical thinking skills and the quality of human interactions (Gerlich, 2025; Zhai et al., 2024). However, this data shows a different result: reliance does not harm the quality of interactions. This indicates that students in this sample use ChatGPT as a "thinking partner" rather than as a "thinking substitute." Furthermore, these findings support the Technology Acceptance Model (TAM), where ease of use (in this case, the perceived helpfulness/dependence of ChatGPT) is positively correlated with user satisfaction (Al-Adwan et al., 2023; Saif et al., 2024). While direct use of the tool (X1) does not necessarily guarantee satisfaction, the feeling of being "helped" by the tool (positive dependency) enhances students' emotional experiences during discussions.

Overall, the use of ChatGPT in academic settings explained 64.8% of the variation in interaction quality and 60.8% of the variation in satisfaction with online discussions. The main findings of this study confirm that ChatGPT functions effectively as a learning accelerator. Although students demonstrated high levels of use, they have not yet reached a level of worrying dependence (moderate category). The quality of discussion is maintained because students use this technology to strengthen their conceptual understanding, which ultimately increases their confidence in participating in digital spaces.

4. CONCLUSION

This study indicates that ChatGPT's role in online discussions is multidimensional and depends on the success indicators being measured. Overall, understanding the material emerged as the most consistent and dominant determinant; it serves as the primary foundation for improving interaction quality and student satisfaction. There are significant differences in influence between the two models analysed: (1) Interaction Quality (Model 1): Positively influenced by the intensity of ChatGPT use and understanding of the material. This indicates that ChatGPT functions effectively as a procedural support tool for discussion processes. (2) Student Satisfaction (Model 2): More influenced by understanding the material and the level of reliance (trust) on the tool, rather than simply the frequency of use. This result confirms that satisfaction is more subjective and effective. Overall, the integration of ChatGPT in education does

not automatically guarantee successful discussions. The effectiveness of this technology depends heavily on students' cognitive capacity (understanding the material) and their ability to use AI proportionally and adaptively. A combination of different factors drives the interrelated aspects of interaction quality and satisfaction.

As a suggestion, students should be provided with guidance on how to use ChatGPT as a "thinking partner" (sparring partner) to deepen their understanding of the material, rather than simply as a tool for copying answers, to maintain the quality of interactions. Given that understanding of the material is the most influential variable, lecturers should still ensure students have a strong grasp of basic concepts before allowing the use of AI tools in discussions. Future researchers may investigate variables such as critical thinking disposition or the moderating influence of lecturer teaching style. Furthermore, given that satisfaction is subjective, qualitative research could be conducted to clarify why the intensity of ChatGPT use does not directly correlate with student satisfaction.

REFERENCES

Alabi, A. J., Oyekola, A. H., & Joyce, O. O. (2025). Lecturers' Perception and Adoption of Artificial Intelligence (AI) Tools in Tertiary Institutions in Ondo State, Nigeria. *Indonesian Journal of Research and Educational Review e–ISSN*, *4*(4), 1664-1676. https://doi.org/10.51574/ijrer.v4i4.3883

Al-Adwan, A. S., Li, N., Al-Adwan, A., Abbasi, G. A., Albelbisi, N. A., & Habibi, A. (2023). Extending the technology acceptance model (TAM) to Predict University Students' intentions to use metaverse-based learning platforms. *Education and Information Technologies*, *28*(11), 15381-15413. https://doi.org/10.1007/s10639-023-11816-3

Ba, S., Zhan, Y., Huang, L., & Lu, G. (2025). Investigating the impact of ChatGPT-assisted feedback on the dynamics and outcomes of online inquiry-based discussion. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.13605

Baskara, F. R., Puri, A. D., & Wardhani, A. R. (2023). ChatGPT and the Pedagogical Challenge: Unveiling the impact on early-Career academics in Higher Education. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, 311-322. https://doi.org/10.23917/ijolae.v5i3.22966

Batsaikhan, B. Z., & Correia, A. P. (2024). The effects of Generative Artificial Intelligence on Intelligent Tutoring Systems in higher education: A systematic review. *Studies in Technology Enhanced Learning*, *4*(1). https://stel.pubpub.org/pub/04-01-batsaikhan-correia/release/1

Bonde, L. (2024). A Generative Artificial Intelligence Based Tutor for Personalized Learning. In *2024 IEEE SmartBlock4Africa* (pp. 1-10). IEEE. https://doi.org/10.1109/SmartBlock4Africa61928.2024.10779525

Cheah, C. W. (2021). Developing a gamified AI-enabled online learning application to improve students' perception of university physics. *Computers and Education: Artificial Intelligence*, *2*, 100032. https://doi.org/10.1016/j.caeai.2021.100032

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Fathony, M. H., Hizraini, A. A., Aulia, R., & Almaisarah, A. (2024). Persepsi Mahasiswa Terhadap Penggunaan Chatgpt Di Universitas Nahdlatul Ulama Kalimantan Selatan. *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, *7*(4), 16601-16607. https://doi.org/10.31004/jrpp.v7i4.33299

Fatmadiwi, A., Hartoyo, A., & Erlina, E. (2025). Kebijakan Artificial Intelligence (AI) dalam Pembelajaran di Perguruan Tinggi. *Jurnal Alwatzikhoebillah: Kajian Islam, Pendidikan, Ekonomi, Humaniora*, *11*(1), 284-291. https://doi.org/10.37567/alwatzikhoebillah.v11i1.3633

Garasut, N., Wenas, J. R., & Maukar, M. G. (2024). Persepsi Mahasiswa Terhadap Penggunaan ChatGPT pada Mata Kuliah Pemodelan Matematika. *SOSCIED*, *7*(2), 570-576. https://doi.org/10.32531/jsoscied.v7i2.846

Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies*, *15*(1), 6. https://doi.org/10.3390/soc15010006

Herlina, H. (2021). Persepsi Mahasiswa pada Pembelajaran Daring Mengunakan Forum Diskusi dan Gmeet pada Masa Pandemi COVID-19. *Jurnal Pendidikan Indonesia*, *2*(11), 1897-1907. https://doi.org/10.59141/japendi.v2i11.338

Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, *2022*(1), 5215722. https://doi.org/10.1155/2022/5215722

Krystalli, P., & Arvanitis, P. (2025). Integrating AI Into Task-Based Language Teaching: Large Language Models in the Designing of Web Quests. In *Harnessing Chatbots for Effective Language Teaching* (pp. 117-150). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9974-3.ch005

Lee, H. Y., Chen, P. H., Wang, W. S., Huang, Y. M., & Wu, T. T. (2024). Empowering ChatGPT with guidance mechanism in blended learning: Effect of self-regulated learning, higher-order thinking skills, and knowledge construction. *International Journal of Educational Technology in Higher Education*, *21*(1), 16. https://doi.org/10.1186/s41239-024-00447-4

Ouyang, F., Zheng, L., & Jiao, P. (2022). Artificial intelligence in online higher education: A systematic review of empirical research from 2011 to 2020. *Education and Information Technologies*, *27*(6), 7893-7925. https://doi.org/10.1007/s10639-022-10925-9

Pahi, K., Hawlader, S., Hicks, E., Zaman, A., & Phan, V. (2024). Enhancing active learning through collaboration between human teachers and generative AI. *Computers and Education Open*, *6*, 100183. https://doi.org/10.1016/j.caeo.2024.100183

Papaneophytou, C., & Nicolaou, S. A. (2025). Promoting Critical Thinking in Biological Sciences in the Era of Artificial Intelligence: The Role of Higher Education. *Trends in Higher Education*, *4*(2), 24. https://doi.org/10.3390/higheredu4020024

Raheef, O. O., & Olayiwola, S. O. (2025). Intellectual Security and Artificial Intelligence: Managing the Balance Between Positivity and Negativity. *ETDC: Indonesian Journal of Research and Educational Review*, *4*(4), 1143-1156. https://doi.org/10.51574/ijrer.v4i4.3194

Owoc, M. L., Sawicka, A., & Weichbroth, P. (2019). Artificial intelligence technologies in education: benefits, challenges and strategies of implementation. *IFIP international workshop on artificial intelligence for knowledge management* (pp. 37-58). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-85001-2_4

Saif, N., Khan, S. U., Shaheen, I., ALotaibi, F. A., Alnfiai, M. M., & Arif, M. (2024). Chat-GPT; validating Technology Acceptance Model (TAM) in education sector via ubiquitous learning mechanism. *Computers in Human Behavior*, *154*, 108097. https://doi.org/10.1016/j.chb.2023.108097

Saykılı, A. (2019). Higher education in the digital age: The impact of digital connective technologies. *Journal of Educational Technology and Online Learning*, *2*(1), 1-15. https://doi.org/10.31681/jetol.516971

Susmita, N., Zaim, M., Thahar, H. E., & Wahyuni, S. (2024). Pemanfaatan Media Kecerdasan Buatan dalam Pembelajaran Bahasa Indonesia Tingkat Sekolah Menengah Atas: Perspektif Siswa. *Visipena*, *15*(1), 80-95. https://doi.org/10.46244/visipena.v15i2.2688

Thomas, D. R., Gatz, E., Gupta, S., Lin, J., Tipper, C., & Koedinger, K. R. (2024). Using generative AI to provide feedback to adult tutors in training and assess real-life performance. *The Learning Ideas Conference* (pp. 204-214). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-73427-4_21

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1), 28. https://doi.org/10.1186/s40561-024-00316-7