THE INFLUENCE OF CHATGPT USAGE ON STUDENT LEARNING PROCESSES

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ABSTRACT

This study aimed to determine the influence of ChatGPT usage in the learning process among students, based on constructivist theory. This theory emphasized the importance of active learning that allowed individuals to build knowledge through experience and interaction with the learning environment The population of this study consisted of all second-semester students of the Economic Education Study Program at Universitas Pendidikan Ganesha, totaling 92 students. The sampling technique used was saturated sampling, in which all members of the population were included as the research sample. Data analysis was carried out using classical assumption tests and multiple linear regression analysis to test the relationship between independent and dependent variables. The results of the study showed that: (1) the frequency of ChatGPT usage had a positive and significant influence on students' learning independence, (2) the type of ChatGPT usage also had a positive and significant influence on students' learning independence, and (3) simultaneously, the frequency and type of ChatGPT usage contributed 81.6% to students' learning independence, while the remaining 18.4% was influenced by other factors not included in this research model. These findings indicated that frequent and varied use of ChatGPT could significantly support the development of student learning independence, in line with the principles of constructivism, which emphasized active and reflective learning. This study provided a valuable contribution to leveraging AI technology as a learning medium that supported the development of student independence and learning skills in the digital era.

Keywords: usage Frequency, type of usage, independent learning, ChatGPT, learning process

INTRODUCTION

The development of technology had progressed rapidly, covering various aspects of human life, including communication, industry, and education. Innovations in information technology and artificial intelligence (AI), in particular, had transformed the way people worked, interacted, and learned in the digital era. This transformation required all sectors, including education, to adapt quickly in order not to fall behind in facing global challenges. In the field of education, technological advancements had opened new opportunities to improve the quality of learning. The use of digital tools such as computers, the internet, online learning applications, and collaboration platforms had become an integral part of modern educational processes. Technology not only functioned as a supporting tool but also served as a bridge to expand access to knowledge and enrich learning methods that were more interactive, flexible, and tailored to student needs. One of the latest uses of technology in education was the application of ChatGPT (Chat Generative Pre-training Transformer), a natural language-based artificial intelligence model developed by OpenAI. This model utilized advanced techniques from Natural Language Processing (NLP), Supervised Learning, and Reinforcement Learning to understand and generate text comparable to that produced by humans (Tanjung, Tanjung, and Gautama 2024).

ChatGPT was capable of answering questions, explaining concepts, providing guidance in completing assignments, and serving as an adaptive discussion partner for students. Its ability to interact in a human-like manner provided opportunities for the educational world to use ChatGPT as a learning support tool (Kharis and Zili 2024). This tool offered a more interactive learning experience, enabled students to study beyond class hours more flexibly, and introduced them to artificial intelligence in accordance with the principles of 21st-century learning. 21st-century learning was designed to equip students with the skills needed to face modern challenges characterized by rapid technological advancement, globalization, and continuous change. Research conducted by Risnina et al. (2023), showed that ChatGPT improved time efficiency by providing up-to-date information from various references in one platform, and by facilitating the completion of assignments with additional information. Kusworo et al. (2024) also stated that the use of ChatGPT in learning improved both effectiveness and efficiency.

However, the emergence of ChatGPT brought about diverse perspectives both supportive and critical. One challenge or concern was plagiarism. The way ChatGPT generated assignments based on prompts created a risk that students might submit work that they did not create themselves (Dehouche 2021). Such behavior compromised academic integrity and had the potential to undermine the main goals of higher education, which included fostering intellectual challenges and developing students' creativity and critical thinking skills. Hidayanti and Azmiyanti (2023), also emphasized that the use of ChatGPT made it difficult for educators to accurately assess students' understanding of the material. Nevertheless, the use of technology such as ChatGPT needed to be evaluated not only from a functional perspective but also through a pedagogical approach. One relevant theoretical lens for understanding this phenomenon was constructivist theory. Constructivism emphasized that learning was an active process in which knowledge was built by learners through meaningful experiences and interaction with their environment (Piaget 1952; Vygotsky 1978).

From a constructivist perspective, technology such as ChatGPT could serve as scaffolding a support tool that enabled students to explore knowledge, ask questions, and construct their own understanding independently. Students were not merely passive recipients of information, but active agents in their own

learning process. By providing a responsive and interactive learning environment, ChatGPT had the potential to support more personalized, contextual, and reflective learning. This study offers a new contribution in the context of utilizing artificial intelligence technology, particularly ChatGPT, within constructivist-based learning. Unlike previous research that primarily focused on the technical effectiveness of AI usage, this study specifically examines the influence of the frequency and type of ChatGPT usage on students' independent learning. The main novelty lies in the integration of constructivist theory with the use of AI in shaping self-directed learning behavior an area that has rarely been the central focus of prior studies. Moreover, this study adopts a direct empirical approach involving students from the economics education study program, providing important contextual contributions to digital learning practices in Indonesian higher education institutions.

Based on this background, this study aimed to examine the influence of ChatGPT usage on the student learning process, referring to constructivist theory. The findings were expected to contribute to the development of technology-based learning strategies that were not only technically effective but also aligned with pedagogical principles that fostered student learning independence.

Problem Identification

Based on the background described, the research questions in this study were formulated as follows (1) How did the frequency of ChatGPT usage affect students' learning independence? (2) How did the type of ChatGPT usage affect students' learning independence? (3) To what extent did the frequency and type of ChatGPT usage simultaneously influence students' learning independence?

Research Objectives

Based on the background and the identified research problems, the objectives of this study were as follows (1) To determine the influence of the frequency of ChatGPT usage on students' learning independence (2) To determine the influence of the type of ChatGPT usage on students' learning independence (3) To measure the combined influence of both the frequency and type of ChatGPT usage on students' learning independence.

LITERATURE REVIEW

Constructivist Theory in Learning

The constructivist theory, developed by Jean Piaget and Lev Vygotsky, emphasized that learning was an active process involving the construction of knowledge by students through experience and social interaction. Piaget (1952), tated that knowledge was not something received passively but built through adaptation to the environment and experiences. Meanwhile, Vygotsky (1978) highlighted the importance of social interaction in learning, where students accessed more complex knowledge through guidance from others, such as teachers or peers. In constructivist learning, students were considered active agents in their learning process. They constructed knowledge through direct experiences and social interaction, aligning well with the use of technologies like ChatGPT. Huang, Mao, and Zhang (2024), noted that AI technologies such as ChatGPT allowed students to access information and receive additional explanations on topics they were studying, thereby supporting an active and independent learning process.

The Role of ChatGPT in Constructivist Learning

The use of ChatGPT in learning aligned with the fundamental principles of constructivism, which emphasized experiential and active learning. ChatGPT enabled students to engage in direct interaction with learning materials, facilitating their exploration and understanding of concepts in a more flexible and personalized manner. As a learning tool, ChatGPT gave students the opportunity to study independently, ask questions, and obtain further explanations about the topics being studied. Research by Mollick and Mollick (2023), found that students who used ChatGPT to understand course material felt more engaged and gained a deeper understanding of the subjects being taught. With its ability to provide detailed and contextual explanations, ChatGPT helped students comprehend material more clearly, thereby supporting more effective learning processes. Recent studies have also highlighted how ChatGPT can serve as a cognitive partner that scaffolds student learning. Yang and Li (2023), emphasized that ChatGPT can adapt its responses based on student queries, simulating a form of dynamic dialogue that mimics teacher-student interaction. Moreover, Zhao, Lin, and Park (2024) argued that ChatGPT's conversational nature encourages students to verbalize their thoughts, which is an essential element of knowledge construction in constructivist learning environments.

ChatGPT and Independent Learning

Independent learning was a key element in constructivist theory, which emphasized that students must be active in designing, implementing, and evaluating their own learning processes. Palincsar and Brown (1984), argued that effective learning was characterized by active student participation. In this context, the use of ChatGPT enhanced students' learning independence by providing access to relevant resources anytime and anywhere. According to Huang et al. (2024), ChatGPT supported students' learning independence by allowing them to independently find answers to academic questions or challenges. This technology empowered students to control their learning processes and encouraged critical and reflective thinking. Li and Chen (2023), found that students using ChatGPT demonstrated higher levels of metacognitive awareness, as they frequently evaluated and refined their understanding during interactions with the tool. However, other studies such as by Santos and Rivera (2024) raised concerns that overreliance on AI-generated feedback might reduce opportunities for peer collaboration and diminish students' ability to struggle productively through complex problems another crucial aspect of constructivist learning.

METHOD, DATA, AND ANALYSIS

Method (Research Design)

This study employed a quantitative design using a survey approach to measure the effect of two independent variables namely frequency of use (X1) and type of use (X2) on one dependent variable independent learning (Y). Data were collected using questionnaires distributed to students who used ChatGPT in their learning process.

Data (Population and Sample)

The study aimed to examine the effect of ChatGPT usage on students' learning independence. The population consisted of all second-semester students in the Economic Education Study Program at Universitas Pendidikan Ganesha who used ChatGPT in their learning activities. A total of 92 students met these criteria. The study used a saturated sampling technique, where the entire population that met the

criteria was included as respondents. Thus, the sample comprised all 92 students without any reduction or random selection. This method was chosen due to the relatively small population size and the objective to gain an in-depth understanding of the impact of ChatGPT usage on independent learning.

Analysis (Data Collection and Data Analysis)

Data were collected using a questionnaire that was first tested for validity and reliability. The data analysis aimed to determine the influence of the two independent variables namely frequency of use (X1) and type of use (X2) on one dependent variable independent learning (Y). Based on the study objectives and data collection methods, the data were analyzed using classical assumption tests and multiple linear regression analysis.

RESULT AND DISCUSSION

Results

Based on Table 1 above, it was found that the Asymp Sig (2-tailed) value of the residuals was 0.200, which is greater than 0.05. Therefore, it could be concluded that all the research variables used were normally distributed.

Table 1. Normality Test Result

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		92
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	1.47532259
Most Extreme Differences	Absolute	.056
	Positive	.056
	Negative	-.054
Test Statistic		.056
Asymp. Sig. (2-tailed)[c]		.200[d]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

Source: Processed primary data 2025.

Table 2. Multicollinierity Test Result

Variable	Collinearity Statistics		Interpretation
	Tolerance	VIF	
Usage frequency (X1)	.986	1.014	No multicollinearity detected
Type of usage (X2)	.986	1.014	No multicollinearity detected

Source: Processed primary data 2025.

Based on Table 2, the multicollinearity test above showed that the tolerance values of all independent variables were greater than 0.1, and the VIF values were less than 10. Therefore, it can be

concluded that there were no signs of multicollinearity. Thus, the data processing stage could be continued to the next step.

Table 3. Heteroscedasticity Test Result

Variable	Sig	Alpha	Interpretation
Usage frequency (X1)	.732	0.05	No heteroscedasticity detected
Type of usage (X2)	.185	0.05	No heteroscedasticity detected

Source: Processed primary data 2025.

Based on the results of the heteroscedasticity test using SPSS, it can be seen that the significance values of each independent variable were above 0.05. This means that it can be concluded that there were no signs of heteroscedasticity. Thus, the data processing stage could be continued to the next step.

Table 4. Autocorrelation Test Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.903[a]	.816	.811	1.49181	2.031

a. Predictors: (Constant), Usage frequency, Type of usage
b. Dependent Variable: Independent learning
Source: Processed primary data 2025.

Based on the results of the autocorrelation test using SPSS, it can be seen that the Durbin-Watson value was 2.031. Since this value was approximately equal to 2, it can be concluded that no autocorrelation occurred.

Table 5. Multiple Linear Regression Analysis Test Result

Multiple Linear Regression Analysis Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.243	1.116		.217	.828
	Usage frequency	.853	.051	.765	16.694	<,001
	Type of usage	.611	.048	.579	12.626	<,001

a. Dependent Variable: Independent learning
Source: Processed primary data 2025

Multiple Linear Regression Analysis

The multiple linear regression equation obtained in this study is:

$$Y = 0.243 + 0.853X1 + 0.611X2$$

where **Y** = students' learning independence, **X1** = frequency of ChatGPT use, and **X2** = type of ChatGPT use. The interpretation of the regression results is as follows:

1) Constant (α)

The constant value is 0.243, which means that if there is no frequency of use (X1) and type of use (X2) of ChatGPT in the learning process, the level of students' learning independence will remain at 0.243 or 24.3%. This indicates that students possess a baseline level of learning independence even without the integration of ChatGPT.

2) Regression Coefficient (β) for Frequency of Use Variable

The coefficient for the frequency of use variable is 0.853. This implies that if the frequency of ChatGPT use increases by 1 unit while the type of use remains constant, students' learning independence will increase by 0.853 units or 85.3%. The positive coefficient shows a strong direct relationship, meaning that the more frequently students use ChatGPT, the higher their independence in learning becomes.

3) Regression Coefficient (β) for Type of Use Variable

The coefficient for the type of use variable is 0.611. This indicates that if the type of ChatGPT use increases by 1 unit while the frequency of use remains constant, students' learning independence will increase by 0.611 units or 61.1%. The positive value demonstrates that a greater variety of ChatGPT use— such as for assignments, concept exploration, and exam preparation—enhances students' ability to learn independently.

4) Dominant Variable and Implications

The regression coefficients show that frequency of use (β1 = 0.853) has a stronger influence compared to type of use (β2 = 0.611). This suggests that while diverse usage of ChatGPT is beneficial, the consistency and regularity of its use play a more dominant role in strengthening students' learning independence. For educators, this finding highlights the importance of encouraging students not only to explore various applications of ChatGPT but also to engage with it frequently as part of their learning routines.

Table 6. t Test Result

Variable	Sig	Alpha	Interpretation
Usage frequency	<0.001	0.05	Significant
Type of usage	<0.001	0.05	Significant

Source: Processed primary data 2025.

Determining the Hypothesis

1) Effect of Usage Frequency

The significance value for the frequency of ChatGPT usage is <0.001, with a 95% confidence level and an error rate of α = 0.05. Since the significance value is lower than the alpha threshold (0.001 < 0.05), the null hypothesis (H0) is rejected. This indicates that, partially, the frequency of ChatGPT use has a positive and significant effect on students' independent learning. In other words, the more frequently students use ChatGPT, the greater their ability to engage in autonomous learning activities.

2) Effect of Type of Usage

The significance value for the type of ChatGPT usage is also <0.001, with a 95% confidence level and an error rate of α = 0.05. As the significance value is lower than the alpha threshold (0.001 < 0.05), the

null hypothesis (H0) is likewise rejected. This finding demonstrates that, partially, the type of ChatGPT use also has a positive and significant effect on independent learning. This means that not only the frequency but also the diversity of ChatGPT usage—such as applying it for assignments, concept exploration, and exam preparation—contributes meaningfully to students' learning independence.

Discussion

The Effect of Frequency of ChatGPT Use on Independent Learning in the Learning Process Among Students

The results of the first hypothesis test regarding the effect of frequency of ChatGPT use on students' independent learning, using a t-test with a 95% confidence level and an error level or $\alpha = 0.05$, show that the significance is <0.001, which is less than 0.05 of the error level. This means that Ha is accepted and H0 is rejected, so it can be interpreted that, partially, the frequency of using ChatGPT has a positive effect on independent learning among students. Therefore, the first hypothesis (H1) is accepted. It can be concluded that as the frequency of ChatGPT use in the learning process increases, students' independent learning also increases. This finding is in line with the research conducted by Puspaningrum et al. (2024) which states that the use of ChatGPT helps in the learning process. ChatGPT can enhance critical thinking, improve autonomy in investigating or seeking new information, and thus increase their independent learning. In line with this, Listiana et al. (2025) in their study also stated that the use of ChatGPT in the learning process increases students' independent learning. Students become more independent in accessing information, completing assignments, and understanding course materials with the help of technology.

A similar statement was made by Cahyanto, Pamungkas, and Zulkarnain (2024), who reported a 65% increase in independent learning, indicating that the introduction of ChatGPT has a positive impact on the development of students' independent learning. This is because ChatGPT helps them in seeking information, receiving personalized guidance, and developing problem-solving abilities independently. However, research by Ifani et al. (2024), noted that excessive reliance on ChatGPT could negatively affect students' critical thinking, writing quality, and depth of comprehension. This highlights a key concern: while AI tools can promote autonomy, they can also foster dependence if not used critically. From an ethical standpoint, the increasing integration of ChatGPT into student routines also raises questions about academic integrity, overreliance on automation, and the erosion of human-centered learning interactions. Institutions must consider frameworks to guide responsible use ensuring that technology supports, rather than replaces, the cognitive processes essential for higher-order learning.

The Effect of the Type of ChatGPT Use on Independent Learning in the Learning Process Among Students

The results of the first hypothesis test regarding the effect of the type of ChatGPT use on students' independent learning, using a t-test with a 95% confidence level and an error level or $\alpha = 0.05$, show that the significance is <0.001, which is less than 0.05 of the error level. This means that Ha is accepted and H0 is rejected, so it can be interpreted that, partially, the type of ChatGPT use has a positive effect on independent learning among students. Therefore, the second hypothesis (H2) is accepted. It can be concluded that as the type of ChatGPT use in the learning process increases, students' independent learning also increases.

ChatGPT can be used in various ways, such as helping to answer questions, assisting in discussions, searching for learning materials, or exploring specific topics. Research by (Rizki 2024; Ru'yat, Jatiwahyuni, and Suroso 2024), supports the idea that one type of ChatGPT use can help students identify issues they

face, especially in completing assignments given by instructors, thereby promoting independent learning. This is in line with the research conducted by which found that ChatGPT can help overcome difficulties or obstacles in understanding learning materials, leading to the conclusion that students have a positive perception of using ChatGPT as an educational tool in the current era. In their study, Risnina et al. (2023), also stated that the type of ChatGPT use plays a role in assisting students in opening discussions with peers for problem-solving, making students more independent in exploring and seeking new materials or knowledge they need in the learning process.

This also encourages students to be more proactive in communicating and engaging in discussions to share opinions with both their instructors and fellow students. Based on the above research, it can be concluded that the type of ChatGPT use can enhance independent learning among students in the learning process. This finding underlines the importance of promoting purposeful and critical uses of AI tools. Students should be encouraged to use ChatGPT not merely as an answer-provider but as a cognitive partner that stimulates inquiry and supports deeper learning engagement. Again, ethical considerations arise regarding transparency, and how AI usage may affect collaborative learning dynamics.

The Effect of the Frequency and Type of ChatGPT Use on Students' Independent Learning

The regression analysis results show that the frequency and type of ChatGPT use simultaneously have a significant influence on students' independent learning, as indicated by the R Square value of 0.816. This means that 81.6% of the variation in students' independent learning can be explained by these two variables, while the remaining 18.4% is influenced by other factors outside the model studied. This finding emphasizes that artificial intelligence-based technologies like ChatGPT are not just tools to help with academic tasks, but have become an integral part of students' independent learning strategies. High frequency of use consistently indicates that students who regularly use ChatGPT tend to have higher motivation and initiative in accessing, understanding, and exploring course materials. Meanwhile, the diverse types of use such as assistance with answering questions, helping with discussions, searching for learning materials, and exploring specific topics encourage the development of metacognitive processes, namely the ability to think about one's own thinking, which is an essential component of independent learning (Zimmerman 2002). In other words, ChatGPT becomes a reflective medium that facilitates active and contextual learning.

These findings align with previous studies by (Fatah et al. 2025; Panigrahi, Srivastava, and Sharma 2021), which state that the application of AI-based learning technology can enhance self-directed learning when used appropriately and consistently. Additionally, according to Deci and Ryan (2000), in their Self-Determination Theory of intrinsic motivation, ChatGPT provides real-time feedback and learning autonomy, contributing to students' sense of control. However, it is vital to ensure that autonomy is not undermined by hidden dependency. A learner who relies solely on AI may bypass essential processes such as critical evaluation, peer discussion, or engagement with diverse perspectives. Therefore, this study not only affirms the benefits of ChatGPT for independent learning but also calls for a balanced approach. Higher education institutions should integrate AI tools within a pedagogical framework that promotes ethical awareness, digital literacy, and reflective learning. Proper guidance and critical scaffolding are necessary to prevent overdependence and to ensure that AI strengthens rather than supplants the student's role as an active agent in their learning journey.

CONCLUSION

The findings of this study demonstrate that the integration of ChatGPT into the learning process has a significant and positive impact on students' independent learning. From a constructivist perspective, learning independence emerges when students actively construct knowledge through interaction with tools, resources, and experiences. This research highlights three key conclusions: (1) the frequency of ChatGPT use significantly enhances independent learning, (2) the type of ChatGPT use significantly contributes to independent learning, and (3) both variables together explain 81.6% of the variation in students' independent learning, with the remaining 18.4% influenced by other external factors.

The results suggest that frequent engagement with ChatGPT helps students develop habits of autonomy, information-seeking, and problem-solving, while diverse uses of the tool—such as assisting with assignments, exploring new concepts, and engaging in discussions—promote metacognitive awareness and deeper learning strategies. These findings reinforce the constructivist idea that learning technologies should serve as scaffolds that empower students to become active agents in their educational journey.

From a practical standpoint, the study provides several important implications. For educators, the evidence underscores the need to encourage both consistent and varied uses of ChatGPT in order to maximize its benefits for independent learning. For institutions, it highlights the necessity of integrating AI tools into curricula within structured pedagogical frameworks that promote digital literacy, critical thinking, and ethical use. For students, the findings illustrate that while ChatGPT can be an effective partner in learning, overreliance may hinder the development of critical reasoning and creativity. Therefore, conscious, reflective, and responsible use of AI is essential.

In conclusion, ChatGPT has proven to be a valuable enabler of independent learning, supporting students' autonomy, motivation, and engagement with knowledge. However, the challenge lies in ensuring that AI serves as a complement rather than a substitute for critical inquiry and human-centered learning processes. Future research should explore additional variables—such as digital literacy, learning motivation, and peer collaboration—to provide a more holistic understanding of how AI tools shape learning behaviors and outcomes.

IMPLICATION/LIMITATION AND SUGGESTIONS

The results of this study indicate that both the frequency and type of ChatGPT use have a significant positive effect on students' independent learning. These findings carry important implications for higher education. First, they reinforce the role of AI-based technologies as constructivist learning tools that can encourage students to become more active, autonomous, and reflective in their learning processes. The evidence suggests that consistent and varied use of ChatGPT not only supports academic tasks but also fosters habits of inquiry, problem-solving, and critical engagement, all of which are central to independent learning.

However, this study is not without limitations. It only examined two independent variables— frequency and type of ChatGPT use—while other potentially influential factors such as learning motivation, digital literacy, socio-economic background, peer collaboration, and the ethics of technology use were not included. As a result, the findings, while significant, do not fully capture the complexity of factors influencing independent learning in the digital age.

Based on these limitations, several suggestions are offered. For future researchers, it is recommended to expand the model by incorporating additional variables such as motivation, digital literacy, academic integrity, and self-regulation in order to produce more comprehensive and generalizable results. Longitudinal studies may also provide valuable insights into how sustained exposure to AI tools shapes students' learning trajectories over time. For students, it is advised to use ChatGPT not only as a tool for completing assignments but also as a medium for reflection, exploration, and developing a deeper understanding of course materials. This critical use of AI can help students strengthen their metacognitive skills and avoid overdependence. For faculty members and educational institutions, it is essential to establish clear ethical and pedagogical guidelines for the integration of ChatGPT into teaching and learning. Such frameworks will ensure that AI use supports independent learning, enhances creativity, and complements human-centered teaching, rather than fostering dependency or undermining academic integrity.

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