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The Influence of ChatGPT on Students' Information Literacy at SMA Negeri 1 Sungayang, Tanah Datar Regency, West Sumatra

Leffiatul Hanifa & Rini Asmara
Universitas Negeri Padang, Indonesia
lefiatulhanifah12@gmail.com; riniasmara@fbs.unp.ac.id

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Abstract

The rapid advancement of artificial intelligence, particularly ChatGPT, has transformed how students access, evaluate, and manage information during learning. Although ChatGPT enables efficient information retrieval, its effective use requires adequate information literacy to critically assess and appropriately apply AI-generated content. This study aims to examine the influence of ChatGPT use on the information literacy of eleventh-grade students at SMA Negeri 1 Sungayang. A quantitative approach with a descriptive-explanatory design was employed, involving 69 students selected through simple random sampling. Data were collected using questionnaires developed based on the Technology Acceptance Model and the Big6 Information Literacy Model and analyzed using descriptive statistics, classical assumption tests, simple linear regression, a *t*-test, and the coefficient of determination. The findings demonstrate that ChatGPT use has a positive and significant effect on students' information literacy ($t = 10.814$, $p < .001$), accounting for 63.6% of the variance in information literacy. The study concludes that appropriate ChatGPT use can support the development of students' information literacy. These findings

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contribute to research on artificial intelligence-assisted learning by demonstrating the relationship between ChatGPT use and information literacy and imply that educational institutions should integrate AI tools with instructional practices that strengthen critical evaluation, responsible information use, and the application of AI-generated content.

Keywords: Artificial Intelligence; Big6 Information Literacy Model; ChatGPT; Information Literacy; Technology Acceptance Model

INTRODUCTION

The rapid digital transformation has fundamentally reshaped educational practices, influencing not only how knowledge is delivered but also how learners search for, evaluate, and construct information. The integration of digital technologies into education has created more interactive, personalized, and flexible learning environments that encourage students to become active participants in the learning process rather than passive recipients of information (Gligorea et al., 2023). Consequently, technological innovation has become an essential component of contemporary education, requiring students to develop competencies that extend beyond traditional academic skills.

Among recent technological innovations, artificial intelligence (AI) has emerged as one of the most influential developments in education. Advances in machine learning, deep learning, and natural language processing have enabled AI systems to understand human language, generate meaningful responses, and provide educational assistance across diverse learning contexts (Sukma et al., 2025). These capabilities have expanded educational opportunities by enabling learners to obtain immediate academic support regardless of time and location.

One of the most widely adopted AI applications in education is ChatGPT, a generative AI platform capable of producing coherent, context-sensitive, and conversational responses to users' inquiries. Its ability to explain concepts, summarize learning materials, generate ideas, and assist with problem-solving has positioned ChatGPT as a valuable learning companion for students in various educational settings (Kasneci et al., 2023). Rather than functioning merely as a digital search tool, the application increasingly serves as an interactive learning assistant that supports independent knowledge acquisition.

The growing popularity of ChatGPT reflects a broader shift in students' information-seeking behavior. Instead of consulting multiple books, websites, or conventional search engines, learners can now obtain comprehensive explanations through a single conversational interface. This transformation has significantly improved the efficiency of information retrieval while simplifying access to educational resources required for academic activities (Aggarwal, 2023). Furthermore, AI-assisted learning environments provide opportunities for more personalized learning experiences by adapting information to users' individual learning needs and preferences (Abuhassna, 2024).

Recent educational research indicates that AI technologies have become an integral part of students' academic routines. A substantial proportion of learners actively employ AI-powered virtual assistants to search for information, complete assignments, and support classroom learning, demonstrating that AI has evolved from an emerging innovation into a commonly utilized educational resource (Vieriu & Petrea, 2025). This widespread adoption illustrates that technological advancement is transforming not only learning resources but also the ways students acquire and process knowledge.

Although these developments offer considerable educational benefits, the extensive use of generative AI also raises important academic concerns. Unlike scholarly sources that undergo editorial and peer-review processes, AI-generated responses are produced through predictive language models and may occasionally contain inaccurate, incomplete, or misleading information presented with a high degree of confidence (Jaramillo Gómez et al., 2025). Consequently, the educational effectiveness of ChatGPT depends not solely on the technology itself but also on learners' ability to critically examine the reliability and credibility of the information they receive.

Within this context, information literacy has become an indispensable competency for students navigating AI-supported learning environments. Information literacy encompasses the ability to identify information needs, locate relevant information, evaluate the credibility of sources, synthesize evidence, and utilize information ethically to solve academic problems (Ozor & Toner, 2022). These competencies are increasingly important because generative AI enables rapid access to information without explicitly demonstrating the verification process underlying its responses.

Previous studies have consistently reported positive educational outcomes associated with ChatGPT implementation. AI-assisted learning has been found to improve students'

academic performance by facilitating faster access to relevant learning resources and supporting conceptual understanding during instructional activities (Rizky & Silalahi, 2025). Likewise, integrating ChatGPT into classroom learning has contributed to the enhancement of students' digital literacy by encouraging more active engagement with digital technologies throughout the learning process (Pamungkas & Markhamah, 2026).

Beyond academic achievement, conversational AI has also demonstrated the potential to strengthen learner autonomy and increase motivation through interactive communication, personalized feedback, and immediate academic assistance. Such characteristics enable students to regulate their own learning more effectively while fostering greater participation in educational activities (Annamalai & Nasor, 2025). Similar findings have shown that introducing ChatGPT into secondary education contributes to students' readiness to utilize emerging technologies responsibly while supporting the development of essential digital competencies (Nurmawati et al., 2023).

Nevertheless, the educational advantages of ChatGPT should not be interpreted solely in terms of learning efficiency or technological acceptance. The convenience of obtaining immediate answers may unintentionally encourage learners to rely on AI-generated responses without conducting further verification through credible academic sources, thereby limiting opportunities to develop critical evaluation skills (Peciuliauskiene et al., 2022). Existing evidence likewise suggests that many students continue to encounter difficulties in assessing information quality and validating digital information before incorporating it into academic work, indicating that information literacy remains a significant educational challenge (Pramudi et al., 2025).

Despite the growing body of literature on ChatGPT in education, existing studies have primarily examined its influence on academic achievement, digital literacy, learning motivation, and technology adoption, while limited attention has been given to its role in shaping students' information literacy, particularly at the senior high school level (Fathon et al., 2024). Moreover, previous investigations have predominantly emphasized learning outcomes without comprehensively examining whether students are capable of critically evaluating AI-generated information before integrating it into their academic activities (Madunić & Sovulj, 2024).

This limitation becomes increasingly significant because information literacy is not automatically developed through frequent technology use. Students may become highly

proficient in utilizing AI applications while simultaneously lacking the competencies required to verify information accuracy, compare multiple sources, and make informed academic judgments. Such circumstances indicate that technological proficiency alone is insufficient to ensure responsible information practices in AI-supported learning environments (Hasanah & Degeng, 2025).

In the Indonesian educational context, this issue deserves greater attention because the integration of generative AI into classroom learning continues to expand, whereas empirical evidence regarding its influence on students' information literacy remains relatively scarce. Most available studies have concentrated on higher education or emphasized digital literacy rather than examining the broader competencies involved in locating, evaluating, synthesizing, and ethically applying information obtained through AI-assisted learning (Bahy & Majid, 2025).

Although previous research has demonstrated the educational benefits of ChatGPT, insufficient empirical evidence explains how students' utilization of generative AI influences the development of information literacy competencies within secondary education. Furthermore, few studies have examined this relationship by integrating technology acceptance with a comprehensive information literacy framework, particularly in Indonesian senior high schools.

To address this gap, the present study integrates the Technology Acceptance Model (TAM) with the Big6 Information Literacy Model to explain the relationship between students' acceptance of ChatGPT and their information literacy competencies. TAM provides a well-established framework for understanding technology adoption through perceived usefulness, perceived ease of use, attitudes toward technology, and behavioral intention to use digital applications (Davis, 1989). Meanwhile, the Big6 framework conceptualizes information literacy as a systematic process involving information problem definition, information seeking, information access, information utilization, information synthesis, and information evaluation (Eisenberg & Berkowitz, 2003).

The conceptual foundation of this research is further reinforced by the Framework for Information Literacy for Higher Education, which emphasizes that information should be critically interpreted, evaluated, and responsibly constructed rather than passively accepted from available sources (Association of College and Research Libraries, 2016). This perspective is particularly relevant within AI-supported learning because generative systems

provide immediate responses without explicitly presenting the processes through which information is verified.

From the perspective of information science, information should be understood not merely as accessible content but as meaningful knowledge that requires interpretation before supporting decision-making processes (Buckland, 1991). Similarly, communication theory recognizes that information transmission is susceptible to distortion during the communication process, emphasizing the importance of validating information before accepting it as reliable knowledge (Shannon & Weaver, 1949). These theoretical perspectives collectively reinforce the necessity of information literacy when interacting with AI-generated content.

Information literacy also functions as a fundamental competency that enables learners to navigate increasingly complex digital information environments. Individuals with strong information literacy are better equipped to distinguish credible evidence from unreliable content, integrate information from multiple sources, and apply knowledge ethically during academic activities (Ningsih & Sayekti, 2023). Such competencies are becoming progressively more important as students encounter rapidly expanding volumes of digital information generated by both humans and artificial intelligence.

Furthermore, responsible AI utilization requires learners to demonstrate critical thinking rather than unquestioningly accepting automatically generated responses. Educational research indicates that information literacy contributes substantially to students' capacity for reflective thinking, evidence-based reasoning, and responsible academic decision-making in technology-rich learning environments (Lestari, 2023). Consequently, strengthening information literacy should be regarded as an essential educational objective alongside the integration of AI into classroom learning.

The novelty of this study lies in its examination of the influence of ChatGPT on senior high school students' information literacy by integrating the Technology Acceptance Model and the Big6 Information Literacy Model within a single analytical framework. Unlike previous studies that primarily focused on learning achievement or digital literacy, this research investigates whether students' acceptance and utilization of generative AI are associated with their ability to identify information needs, evaluate source credibility, synthesize information, and apply information responsibly in academic contexts. Based on these considerations, this study aims to examine the influence of ChatGPT on the

information literacy of eleventh-grade students at SMA Negeri 1 Sungayang. The findings are expected to provide empirical evidence regarding the educational implications of generative AI for information literacy development while contributing to the growing body of knowledge on AI-assisted learning and information science.

METHODS

This study employed a quantitative approach using a descriptive design combined with explanatory analysis to examine the influence of ChatGPT use on students' information literacy. A quantitative approach was selected because it enables objective measurement of research variables through numerical data analyzed using statistical techniques, thereby providing empirical evidence of the relationship between the independent and dependent variables. The descriptive design was applied to describe the characteristics of each variable, while the explanatory component was intended to investigate the effect of ChatGPT use as the independent variable (X) on students' information literacy as the dependent variable (Y).

The independent variable, ChatGPT use, was operationalized using the Technology Acceptance Model (TAM), which comprises four dimensions: Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, and Behavioral Intention to Use. Meanwhile, students' information literacy was measured using the Big6 Information Literacy Model, which includes six dimensions: Task Definition, Information Seeking Strategies, Location and Access, Use of Information, Synthesis, and Evaluation. These theoretical dimensions were translated into structured questionnaire items to assess respondents' perceptions and experiences regarding both research variables.

The study involved eleventh-grade students of SMA Negeri 1 Sungayang as the research participants. The target population consisted of 219 students, while the sample comprised 69 respondents selected through simple random sampling, ensuring that every member of the population had an equal opportunity to participate. The sample size was determined using the Slovin formula with a 10% margin of error, resulting in a representative sample capable of addressing the research objectives and reflecting the characteristics of the target population.

Data were collected primarily through a structured questionnaire, complemented by library research and documentation. The questionnaire was developed based on the

indicators of the two research variables and employed a four-point Likert scale ranging from Strongly Disagree to Strongly Agree. Prior to data collection, the instrument was evaluated through validity and reliability testing. Construct validity was assessed using the Corrected Item–Total Correlation, whereas internal consistency was examined using Cronbach's Alpha. The findings indicated that all questionnaire items met the required validity criteria, while the Cronbach's Alpha coefficient of 0.945 demonstrated excellent internal consistency, confirming that the instrument was appropriate for subsequent statistical analysis.

RESULTS

a. Normality Test

Table 1. Normality Test Results

Variabel	Kolmogorov- Smirnov	Sig	Shapiro- Wilk	Sig
Standardized Residual	0,092	0,200	0,975	0,186

source: Compiled by the researcher (2026)

Table 1. Normality Test Results shows that the Kolmogorov–Smirnov and Shapiro–Wilk significance values are 0.200 and 0.186, respectively, both exceeding 0.05. These results indicate that the residuals are normally distributed and satisfy the normality assumption.

b. Linearity Test

Table 2. Linearity Test Results

Komponen	F	Sig
Linearity	127,471	<0,001
Deviation from Linearity	1,317	0,217

source: Compiled by the researcher (2026)

Table 2. Linearity Test Results shows that the Deviation from Linearity significance value is 0.217, which exceeds 0.05, while the Linearity significance value is < 0.001. These results indicate a significant linear relationship between ChatGPT use (X) and students' information literacy (Y).

c. Heteroscedasticity Test

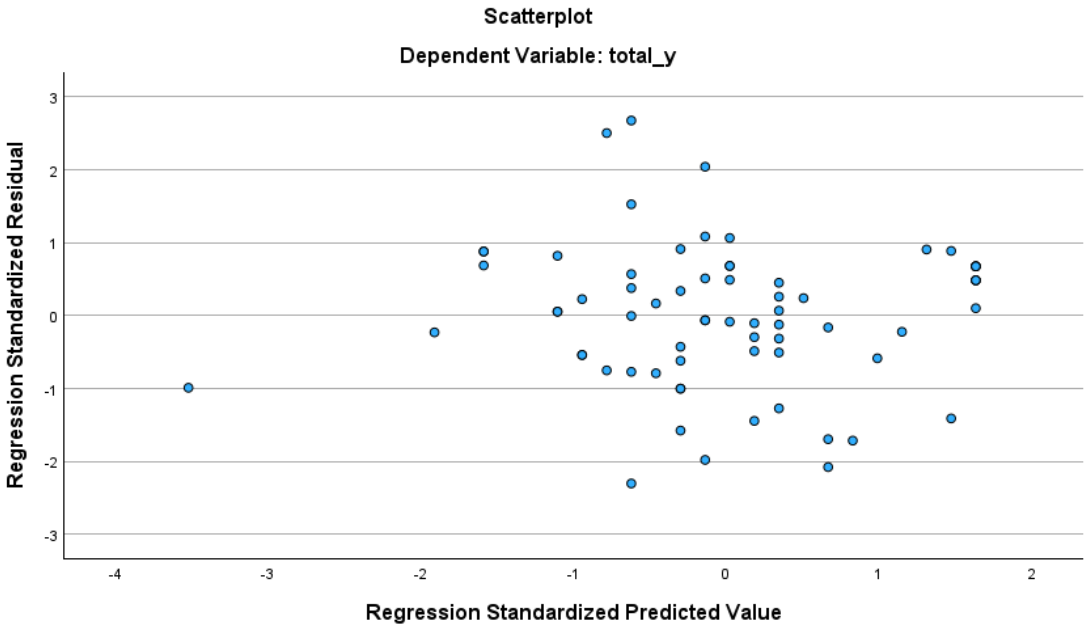


Figure 3. Heteroscedasticity Test Results

Figure 3. Heteroscedasticity Test Results shows that the residuals are randomly dispersed above and below the zero line without forming a specific pattern, indicating that no heteroscedasticity is present and the homoscedasticity assumption is satisfied.

d. Autocorrelation Test

Table 3. Autocorrelation Test Results

Model	Durbin- Watson
1	1,661

source: Compiled by the researcher (2026)

Table 3. Autocorrelation Test Results shows a Durbin–Watson value of 1.661, indicating that the regression model is free from autocorrelation and satisfies the autocorrelation assumption.

e. Simple Linear Regression Test

Table 4. Simple Linear Regression Results

Variabel	B	Std. Error	Beta	t	Sig
Konstanta	21,879	5,530	-	3,957	< 0,001
ChatGPT use (X)	1,103	0,102	0,797	10,814	< 0,001

source: Compiled by the researcher (2026)

Table 4. Simple Linear Regression Results shows a constant value of 21.879 and a regression coefficient of 1.103, resulting in the regression equation Y = 21.879 + 1.103X.

The positive regression coefficient indicates that each one-unit increase in ChatGPT use is associated with a 1.103-unit increase in students' information literacy.

f. Coefficient of Determination Test

Table 5. Coefficient of Determination Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,797	0,636	0,630	5,222

source: Compiled by the researcher (2026)

Table 5. Coefficient of Determination Results shows an R Square value of 0.636, indicating that ChatGPT use explains 63.6% of the variance in students' information literacy, while the remaining 36.4% is explained by other factors not examined in this study.

g. Model Feasibility Test (F-Test)

Table 6. F-Test Results

Model	F Value	Sig.	Interpretation
Regression	116.948	< 0.001	Regression model is statistically significant (fit)

source: Compiled by the researcher (2026)

Table 6. F-Test Results shows an F value of 116.948 with a significance value of < 0.001, indicating that the regression model is statistically significant and appropriate for explaining the relationship between ChatGPT use and students' information literacy.

h. Hypothesis Test (t-Test)

Table 7. Hypothesis Test Results

Variable	t Value	Sig.	Decision
ChatGPT Use (X)	10.814	< 0.001	H_0 Rejected, H_1 Accepted

source: Compiled by the researcher (2026)

Table 7. Hypothesis Test Results shows a t value of 10.814 with a significance value of < 0.001, indicating that ChatGPT use has a positive and statistically significant effect on students' information literacy.

DISCUSSION

The findings of this study demonstrate that ChatGPT has a positive and statistically significant influence on the information literacy of eleventh-grade students at SMA Negeri 1 Sungayang. The regression analysis revealed a positive regression coefficient ($\beta = 1.103$), indicating that increased utilization of ChatGPT was associated with higher levels of information literacy. This relationship was further supported by the t-test result ($t = 10.814$, $p < 0.001$), confirming that ChatGPT significantly predicts students' information literacy. In

addition, the coefficient of determination ($R^2 = 0.636$) indicates that ChatGPT use explains 63.6% of the variance in students' information literacy, suggesting that the technology contributes substantially to the development of information literacy competencies, while the remaining 36.4% may be explained by other educational and individual factors not examined in this study.

These findings suggest that ChatGPT functions not merely as an information retrieval tool but also as a learning resource that supports students throughout the information-seeking process. Students who actively use ChatGPT are more likely to identify their information needs, obtain relevant explanations efficiently, compare different perspectives, and organize information into meaningful knowledge. Such learning experiences indicate that generative artificial intelligence can facilitate independent learning by reducing barriers to information access while simultaneously encouraging students to explore academic content more effectively. Nevertheless, these benefits can only be fully realized when learners critically evaluate AI-generated responses before incorporating them into academic tasks.

The results are consistent with the Big6 Information Literacy Model, which conceptualizes information literacy as a systematic process consisting of task definition, information-seeking strategies, location and access, information use, synthesis, and evaluation. ChatGPT appears to support each of these stages by assisting students in identifying information needs, locating relevant information, generating alternative explanations, synthesizing ideas, and organizing information into coherent responses. However, the evaluation stage remains particularly important because AI-generated content should always be verified against credible academic sources before being accepted as reliable knowledge. This finding reinforces the argument that technological advancement should complement, rather than replace, students' critical thinking and evaluative abilities.

The present findings also align with previous empirical studies. Research by Satria et al. (2025) reported that ChatGPT positively influences students' learning activities by improving the efficiency of information retrieval and supporting classroom learning. Likewise, Syafitri and Asmara (2025) found that artificial intelligence enhances learning effectiveness by providing rapid access to information tailored to learners' needs. The consistency between the present findings and earlier studies strengthens the growing body of evidence suggesting that generative AI can become a valuable educational technology

when integrated appropriately into teaching and learning processes. Rather than functioning solely as a technological innovation, ChatGPT has the potential to become an effective learning partner capable of supporting students' cognitive development and information management skills.

From a theoretical perspective, this study extends previous research by integrating the Technology Acceptance Model (TAM) with the Big6 Information Literacy Model. While TAM explains students' acceptance of ChatGPT through perceived usefulness, perceived ease of use, attitudes, and behavioral intention, the Big6 framework explains how such acceptance may contribute to the development of information literacy competencies. The integration of these two frameworks provides a more comprehensive understanding of how technology adoption influences students' ability not only to access information but also to evaluate, synthesize, and apply information responsibly. Therefore, this study contributes to the growing literature on artificial intelligence in education by demonstrating that technology acceptance and information literacy should be examined as interconnected constructs rather than independent phenomena.

Practically, these findings have important implications for educational institutions. Schools should not only encourage the responsible use of ChatGPT but also strengthen students' information literacy through instructional activities emphasizing source evaluation, information verification, and ethical information use. Teachers play an essential role in guiding students to critically examine AI-generated responses rather than accepting them unquestioningly. Consequently, integrating AI literacy with information literacy may better prepare students to navigate increasingly complex digital information environments while minimizing the risks associated with misinformation and overreliance on artificial intelligence.

Despite these contributions, several limitations should be acknowledged. First, the study involved only 69 students from a single senior high school, limiting the generalizability of the findings to broader educational contexts. Second, the quantitative survey design relied on self-reported questionnaire responses, which may not fully capture students' actual information literacy practices during real learning activities. Third, the model examined only one independent variable, whereas information literacy is likely influenced by other factors such as critical thinking, digital literacy, learning motivation, teacher support, and learning environment. Future studies are therefore encouraged to incorporate additional variables,

larger and more diverse samples, and mixed-methods approaches to provide a more comprehensive understanding of the educational implications of generative artificial intelligence. Overall, the findings confirm that ChatGPT represents a promising educational technology capable of supporting students' information literacy, provided that its use is accompanied by critical evaluation, responsible information practices, and appropriate pedagogical guidance.

CONCLUSION

This study concludes that ChatGPT has a positive and significant influence on the information literacy of eleventh-grade students at SMA Negeri 1 Sungayang. The findings demonstrate that students who utilize ChatGPT more effectively tend to exhibit higher levels of information literacy, particularly in identifying information needs, locating relevant sources, processing information, synthesizing knowledge, and evaluating information critically. These results successfully address the research objective by providing empirical evidence that the use of generative artificial intelligence can contribute to the development of students' information literacy competencies when applied appropriately in educational settings.

The study contributes both theoretically and practically to the growing field of artificial intelligence in education. Theoretically, it extends previous research by integrating the Technology Acceptance Model (TAM) with the Big6 Information Literacy Model, demonstrating that students' acceptance and use of ChatGPT are closely associated with the development of information literacy skills. Practically, the findings suggest that ChatGPT can serve as an effective supplementary learning tool that supports information retrieval, knowledge construction, and independent learning, provided that students critically evaluate AI-generated information before applying it in academic contexts.

The implications of this study highlight the importance of integrating artificial intelligence with information literacy instruction in schools. Educators should encourage students to use ChatGPT responsibly while strengthening their critical thinking, source evaluation, and information verification skills. Schools are also encouraged to develop learning strategies and policies that promote the ethical and effective use of AI technologies in teaching and learning.

Despite its contributions, this study is limited to a single research setting and one independent variable. Future research is therefore recommended to involve more diverse educational contexts, larger samples, and additional variables, such as digital literacy, critical thinking, learning motivation, or teacher support. Employing mixed-methods or longitudinal designs may also provide a more comprehensive understanding of how generative artificial intelligence influences students' information literacy over time.

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