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The Effect of Gemini AI Usage on the Information Literacy of Students in the Library and Information Science Study Program

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Abstract

The rapid advancement of artificial intelligence (AI), particularly generative AI technologies such as Gemini AI, has transformed how students access and use information in academic contexts. Although these technologies offer efficiency and convenience, concerns remain regarding students' ability to critically evaluate the credibility of AI-generated information. This study aims to examine the effect of Gemini AI usage on the information literacy of students in the Library and Information Science Study Program at Universitas Negeri Padang. A quantitative approach with a descriptive and associative design was employed. The population consisted of 258 students, from which 72 respondents were selected using purposive sampling. Data were collected through a validated and reliable Likert-scale questionnaire and analyzed using descriptive statistics, product-moment correlation, and simple linear regression with IBM SPSS. The findings indicate that Gemini AI usage has a positive and significant effect on students' information literacy, with a significance value of $0.002 < 0.05$. The coefficient of determination ($R^2 = 0.130$) shows that Gemini AI usage contributes 13% to students' information literacy, while the remaining variance is influenced by other factors. Descriptively, students

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demonstrated strong abilities in identifying and accessing information; however, limitations were found in their ability to critically evaluate the accuracy and credibility of AI-generated content. This study concludes that Gemini AI usage can enhance students' information literacy but does not fully support critical evaluation skills. The findings contribute to the literature on AI-assisted information behavior and imply the need to integrate AI adoption with the strengthening of critical and evaluative competencies in higher education.

Keywords: Artificial Intelligence; Gemini AI; Information Literacy; AI-Generated Information; Higher Education

INTRODUCTION

The rapid development of Artificial Intelligence (AI) over the past two decades has fundamentally transformed the global information ecosystem, particularly in the ways individuals access, process, and utilize information. This transformation has been significantly accelerated by the emergence of generative AI technologies based on large language models, such as Gemini AI, which are capable of producing information that is fast, contextual, and adaptive to user needs (Ikhlas et al., 2025; Garetto et al., 2025). Unlike traditional information retrieval systems that rely heavily on keyword-based searches, generative AI introduces a paradigm shift toward interactive, conversational, and context-aware information systems. These systems are designed not only to retrieve data but also to synthesize knowledge, generate explanations, and assist users in solving complex problems in real time (Alqahtani et al., 2023; Bewersdorff et al., 2025). In the context of higher education, the integration of generative AI technologies has significantly reshaped students' learning behaviors and information-seeking practices. Students are no longer solely dependent on conventional academic sources such as printed books or scholarly journals. Instead, they increasingly rely on AI-powered tools that offer rapid access to information and provide immediate, structured responses to academic queries (Sari, 2024). This shift reflects a broader transformation in the nature of learning, where efficiency and accessibility are prioritized. However, while AI technologies provide undeniable advantages in terms of speed and convenience, they also introduce critical challenges related to the quality, credibility, and reliability of the information produced.

One of the primary concerns associated with the use of generative AI in academic contexts is the potential for misinformation and inaccuracies. AI-generated outputs are not always transparent in terms of their sources, making it difficult for users to verify the validity of the information provided. As a result, students may become passive recipients of information, accepting outputs without engaging in critical evaluation (Salsabila, 2024) (Ibrahim et al., 2024). Furthermore, excessive reliance on AI tools may reduce students' ability to think critically and independently, potentially undermining the development of essential academic skills such as analysis, synthesis, and evaluation (Pikhart, 2025). These challenges highlight the need for a balanced approach to AI integration in education, where technological benefits are complemented by strong cognitive and evaluative competencies. In this regard, information literacy emerges as a fundamental competency that plays a crucial role in mediating the use of AI technologies in academic environments. Information literacy is not limited to the technical ability to access and retrieve information; rather, it encompasses a broader set of skills that include identifying information needs, critically evaluating sources, interpreting content, and using information ethically and responsibly (Ramdhyani, 2023; Fitri et al., 2023). These competencies are essential in ensuring that students can navigate complex information environments effectively and make informed decisions based on reliable data.

From a conceptual perspective, information literacy is understood as a comprehensive process that involves multiple stages of information engagement. It includes the ability to recognize information needs, locate relevant sources, assess the credibility and relevance of information, organize and manage data, and ultimately communicate findings in an ethical manner (Liriwati et al., 2024). In an era characterized by an overwhelming abundance of information, these skills are increasingly important, as not all available information is accurate, reliable, or appropriate for academic use (Ningsih & Sayekti, 2023). Therefore, the development of information literacy is essential in enabling students to critically engage with AI-generated content. The Seven Pillars of Information Literacy model developed by SCONUL provides a structured and systematic framework for understanding these competencies. The model outlines seven key stages—identify, scope, plan, gather, evaluate, manage, and present—which collectively represent the process through which individuals interact with information (Sconul, 2011) (Shukla, 2021). Each stage plays a critical role in ensuring the effective use of information. Among these stages, the evaluation phase is particularly crucial in the context of generative AI, as it

involves assessing the accuracy, credibility, and relevance of information that may not always be verifiable (Ibrahim et al., 2024) (Fendt et al., 2025). Consequently, students must develop strong evaluative and analytical skills to effectively utilize AI-generated information.

In addition to information literacy, the acceptance and adoption of technology also play a significant role in determining how AI tools are utilized in academic contexts. The Technology Acceptance Model (TAM), introduced by Davis, provides a theoretical framework for understanding users' acceptance of technology (Davis, 1989). According to TAM, two primary factors influence technology adoption: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which a user believes that a particular technology enhances their performance, while perceived ease of use relates to the degree to which the technology is perceived as easy to use without requiring significant effort. In the context of generative AI, perceived usefulness can be observed through the extent to which AI tools improve students' academic performance, increase productivity, and facilitate the completion of tasks. AI technologies enable students to access information quickly, generate structured responses, and complete assignments more efficiently (Sabur & Benson, 2024) (Bansah & Agyei, 2022). Meanwhile, perceived ease of use is reflected in the simplicity and intuitiveness of AI systems, which allow users to interact with the technology without extensive training or technical expertise (Huang & Liu, 2022) (Rinawiyanti et al., 2025). Together, these factors influence students' willingness to adopt and continuously use AI tools in their academic activities (Martin, 2022) (Kurnia et al., 2024) (Azkiya, 2023) (Buana et al., 2021).

A growing body of literature has examined the role of AI in higher education. Several studies have demonstrated that AI technologies can enhance students' learning experiences by improving efficiency and accessibility. For instance, Addin (2025) found that Gemini AI contributes to the development of students' digital and visual literacy skills. Similarly, Wulandari and Asmara (2025) reported that students generally have positive perceptions of AI tools due to their ability to facilitate academic tasks. Other studies indicate that AI usage positively influences students' digital literacy and academic performance (Galagala & Bacarrisas, 2025). Furthermore, previous research has also explored the relationship between information literacy and the use of AI in academic contexts. Lusiana et al. (2024) found that students with higher levels of information literacy are better able to utilize AI tools effectively. Similarly, Maulida et al. (2024) emphasized that

information literacy plays a critical role in supporting self-directed learning among students. These findings suggest that information literacy is an important factor in determining how students engage with AI technologies.

However, despite the growing interest in this area, existing studies still exhibit several limitations. Most research tends to focus either on the technological aspects of AI usage or on students' perceptions of AI independently, without integrating these perspectives into a comprehensive analytical framework. As a result, there is a lack of empirical evidence that explains how information literacy and technology acceptance interact in shaping students' information-seeking behaviors. The research gap of this study lies in the limited empirical investigation that integrates information literacy with the Technology Acceptance Model in the context of generative AI usage as an academic information source. Previous studies have largely examined these variables in isolation, leading to a fragmented understanding of how students interact with AI technologies in academic settings.

To address this gap, this study adopts an integrative approach that combines the perspectives of information literacy and technology acceptance. The novelty of this research lies in examining the relationship between the use of Gemini AI and students' information literacy through a quantitative framework that integrates perceived usefulness and perceived ease of use with the Seven Pillars of Information Literacy model. This approach provides a more comprehensive understanding of how students not only adopt AI technologies but also utilize them critically and responsibly in academic contexts. Therefore, this study aims to analyze the influence of Gemini AI usage on students' information literacy in the Library and Information Science program. Specifically, it seeks to examine the relationship between perceived usefulness, perceived ease of use, and students' information literacy levels, as well as to measure the magnitude of this influence empirically. The findings of this study are expected to contribute to the theoretical development of information literacy and technology acceptance research, as well as provide practical insights into promoting the critical and responsible use of AI in higher education.

METHODS

This study employs a quantitative approach with a descriptive method to examine the influence of Gemini AI usage on students' information literacy levels in the Library and Information Science program at Universitas Negeri Padang. The quantitative approach is

selected to enable objective measurement of the research variables through numerical data analyzed using statistical techniques, thereby producing systematic and generalizable findings. The descriptive method is used to provide an empirical representation of the relationships between variables and to identify patterns of influence based on the collected data. The research design is associative quantitative, aiming to investigate the relationship and influence between the independent and dependent variables. The independent variable in this study is the use of Gemini AI (X), while the dependent variable is students' information literacy level (Y). The measurement of Gemini AI usage is based on the Technology Acceptance Model (TAM), which consists of two main constructs: perceived usefulness and perceived ease of use. Perceived usefulness includes indicators such as improved performance, faster task completion, increased productivity, effectiveness, usefulness, and ease in accomplishing academic tasks. Meanwhile, perceived ease of use includes ease of learning, controllability, clarity, flexibility, ease of becoming skillful, and overall ease of use. Information literacy is measured using the Seven Pillars of Information Literacy model, which consists of seven indicators: identify, scope, plan, gather, evaluate, manage, and present. These indicators are operationalized into questionnaire items to measure the relationship between AI usage and information literacy.

The population of this study consists of 258 students from the Library and Information Science program enrolled in the 2022, 2023, and 2024 cohorts. The sampling technique employed is non-probability sampling using purposive sampling, where participants are selected based on specific criteria relevant to the research objectives. The primary criterion is that participants must have experience using Gemini AI as an academic information source. The sample size is determined using the Slovin formula with a margin of error of 10%, resulting in a total of 72 respondents. This sampling approach ensures that the selected respondents possess relevant experience with the technology under investigation. The primary research instrument used in this study is a structured questionnaire developed based on the research variables and their respective indicators. The questionnaire employs a four-point Likert scale, consisting of strongly disagree, disagree, agree, and strongly agree, with the neutral option intentionally excluded to minimize ambiguous responses. The instrument is constructed systematically to ensure that each item accurately represents the corresponding indicator. Prior to data collection, the instrument undergoes validity and reliability testing. Validity testing is conducted using the product-moment correlation technique with IBM SPSS Statistics 31, and the results

indicate that almost all items are valid, with only one item excluded. Reliability testing is conducted using Cronbach's Alpha, yielding coefficients of 0.908 for the Gemini AI variable and 0.891 for the information literacy variable, indicating high internal consistency.

Data collection is carried out through an online questionnaire distributed via Google Forms. The questionnaire is shared with respondents through WhatsApp to facilitate accessibility and increase response rates. In addition to primary data obtained from the questionnaire, secondary data sources such as books, academic journals, and related documents are also utilized to support the research. The data collection process is conducted over a period of several months during the research timeline, ensuring that sufficient and reliable data are obtained. The data analysis technique consists of both descriptive and inferential statistical methods. The initial stage involves data editing to ensure completeness and consistency, followed by tabulation into frequency distribution tables. Descriptive statistics are used to summarize and describe the characteristics of the data. To examine the relationship between variables, the product-moment correlation analysis is applied, while simple linear regression analysis is used to determine the effect of the independent variable on the dependent variable at a significance level of 0.05. Prior to inferential analysis, prerequisite tests are conducted, including the normality test using the Kolmogorov-Smirnov method and the linearity test to ensure the appropriateness of regression analysis. Additionally, the coefficient of determination is calculated to assess the extent to which Gemini AI usage explains variations in students' information literacy levels. Overall, this research methodology is designed systematically to ensure the validity, reliability, and scientific rigor of the findings, providing a comprehensive understanding of the relationship between generative AI usage and students' information literacy.

RESULTS

This section presents the results of the study on the effect of Gemini AI usage on students' information literacy in the Library and Information Science Study Program. The results are presented systematically, including instrument testing, descriptive analysis, and hypothesis testing, supported by empirical data obtained from 73 respondents.

Validity Test

Validity refers to the degree of accuracy between the actual data occurring in the research object and the data reported by the researcher (Arya et al., 2022). The validity test

is conducted to determine the ability of the research instrument to measure what it is intended to measure. This test aims to ensure that each statement in the questionnaire accurately represents the research variables.

Table 1. Validity Test of the Research Instrument

Item	Pearson Correlation	R table	Description
1	0,573	0,361	Valid
2	0,460	0,361	Valid
3	0,397	0,361	Valid
4	0,632	0,361	Valid
5	0,666	0,361	Valid
6	0,347	0,361	Tidak Valid
7	0,646	0,361	Valid
8	0,557	0,361	Valid
9	0,677	0,361	Valid
10	0,606	0,361	Valid
11	0,526	0,361	Valid
12	0,544	0,361	Valid
13	0,524	0,361	Valid
14	0,498	0,361	Valid
15	0,626	0,361	Valid
16	0,678	0,361	Valid
17	0,484	0,361	Valid
18	0,716	0,361	Valid
19	0,614	0,361	Valid
20	0,507	0,361	Valid
21	0,567	0,361	Valid
22	0,677	0,361	Valid
23	0,454	0,361	Valid
24	0,694	0,361	Valid
25	0,543	0,361	Valid
26	0,456	0,361	Valid
27	0,886	0,361	Valid
28	0,789	0,361	Valid
29	0,762	0,361	Valid
30	0,674	0,361	Valid
31	0,814	0,361	Valid

Item	Pearson Correlation	R table	Description
32	0,777	0,361	Valid
33	0,555	0,361	Valid
34	0,814	0,361	Valid
35	0,587	0,361	Valid
36	0,515	0,361	Valid
37	0,561	0,361	Valid
38	0,610	0,361	Valid

source: Compiled by the researcher (2026)

Reliability Test

The reliability test is a process used to measure the consistency and stability of a research instrument. Reliability aims to ensure that an instrument is appropriate for data collection. A questionnaire is considered reliable if respondents' answers show consistency (Karnia, 2024).

In this study, reliability was tested using Cronbach's Alpha (α) with the following criteria:

1) If Cronbach's Alpha > 0.70, the instrument is considered reliable

2) If Cronbach's Alpha < 0.70, the instrument is considered not reliable (Setyaedhi, 2024)

Based on the results from IBM SPSS Statistics 31, the following values were obtained:

Table 2. Reliability Test

Variabel	Nilai cronbach's alpha	Description
Gemini AI Usage (X)	0,908	Reliabel
Students' Information Literacy (Y)	0,891	Reliabel

source: Compiled by the researcher (2026)

Analysis Assumption Tests

a. Normality Test

The normality test is conducted to determine whether the data distribution within a group or variable follows a normal distribution. The decision criteria are as follows: if the significance value > 0.05, the residuals are normally distributed; if the significance value < 0.05, the residuals are not normally distributed. The following are the results of the normality test in this study.

Table 3. Normality Test Results

One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			72
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		4.28954400
Most Extreme Differences	Absolute		.081
	Positive		.081
	Negative		-.058
Test Statistic			.081
Asymp. Sig. (2-tailed)[c]			.200[d]
Monte Carlo Sig. (2-tailed)[e]	Sig.		.290
	99% Confidence Interval	Lower Bound	.278
		Upper Bound	.302

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

source: Compiled by the researcher (2026)

The normality test was performed using the One-Sample Kolmogorov–Smirnov test with the assistance of IBM SPSS Statistics 31. The results show a significance value of 0.200 > 0.05. Therefore, it can be concluded that the residual values are normally distributed.

b. Linearity Test

The linearity test is used to examine whether the relationship between two variables is linear or non-linear. The decision criteria are: if the significance value of deviation from linearity > 0.05, there is a linear relationship between the independent variable (X) and the dependent variable (Y); if it is < 0.05, there is no linear relationship. The following are the results of the linearity test using the Compare Means procedure in this study.

Table 4. Linearity Test Results

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Y * X	Between Groups	(Combined)	614.619	25	24.585	1.274	.234
		Linearity	195.906	1	195.906	10.152	.003
		Deviation from Linearity	418.713	24	17.446	.904	.596
	Within Groups		887.700	46	19.298		
	Total		1502.319	71			

Based on the table above, the significance value of deviation from linearity is 0.596 > 0.05. This indicates that there is a linear relationship between the use of Gemini AI and information literacy.

c. Correlation Test

The correlation test is conducted to determine the relationship between two variables and to measure the strength of that relationship. The correlation between variable X and variable Y was analyzed using the Pearson product-moment correlation with the assistance of IBM SPSS Statistics 29. The decision criteria are: if the significance value < 0.05, the variables are correlated; if > 0.05, they are not correlated. The following are the results of the correlation test.

Table 5. Correlation Test Results

Correlations

		X	Y
X	Pearson Correlation	1	.361**
	Sig. (2-tailed)		.002
	N	72	72
Y	Pearson Correlation	.361**	1
	Sig. (2-tailed)	.002	
	N	72	72

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

source: Compiled by the researcher (2026)

Based on the correlation test results above, the significance value obtained is 0.002 < 0.05. Therefore, there is a significant correlation between the use of Gemini AI (X) and information literacy (Y).

d. Simple Linear Regression Test

The simple linear regression test is used to examine the effect of one independent variable on a dependent variable. The requirements for this test include valid and reliable data, normally distributed data, and a linear relationship. The decision criteria are: if the significance value > 0.05, the independent variable (X) does not affect the dependent variable (Y), meaning H_0 is accepted and H_a is rejected. If the significance value < 0.05, the independent variable (X) affects the dependent variable (Y), meaning H_a is accepted and H_0 is rejected. The following are the results of the regression test in this study.

Table 6. Simple Linear Regression Results

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	195.906	1	195.906	10.497	.002[b]
	Residual	1306.413	70	18.663		
	Total	1502.319	71			

a. Dependent Variable: Y

b. Predictors: (Constant), X

source: Compiled by the researcher (2026)

Based on the table above, the F-value is 10.4974 with a significance level of 0.002 < 0.05. Thus, H_a is accepted and H_0 is rejected, indicating that the use of Gemini AI (X) has a significant effect on information literacy (Y).

e. Coefficient of Determination Test

The coefficient of determination test is conducted to determine the extent to which the independent variable (X) explains the dependent variable (Y), as well as the magnitude of the effect between the use of Gemini AI (X) and information literacy (Y). The following are the results of this test.

Table 7. Coefficient of Determination Results

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.361[a]	.130	.118	4.32007

a. Predictors: (Constant), X

source: Compiled by the researcher (2026)

Based on the table above, the correlation value (R) is 0.361. The coefficient of determination (R Square) is 0.130, indicating that the independent variable (use of Gemini AI) explains 13% of the variance in the dependent variable (information literacy), while the remaining 87% is influenced by other factors not examined in this study. Therefore, it can be concluded that the use of Gemini AI has an effect on information literacy.

DISCUSSION

This section discusses the findings of the study on the effect of Gemini AI usage on students' information literacy in the Library and Information Science Study Program.

The discussion focuses on the interpretation of results, comparison with previous studies, implications of the findings, and research limitations.

The results of this study indicate that Gemini AI usage has a significant and positive effect on students' information literacy. This finding means that the higher the level of Gemini AI usage, the better the students' ability to identify, access, manage, and utilize information. This result supports the research objective, which aims to examine the influence of AI technology on students' information literacy. From a theoretical perspective, this finding aligns with the Technology Acceptance Model (TAM) proposed by Davis (1989), which states that perceived usefulness and perceived ease of use influence users' behavior in adopting technology. In this study, students perceive Gemini AI as useful in improving academic performance and easy to use, which encourages them to utilize the technology more frequently. As a result, increased interaction with Gemini AI contributes to the development of their information literacy skills, particularly in accessing and gathering information efficiently.

However, although the overall results show a positive influence, the descriptive findings reveal that not all aspects of information literacy are equally strong. Students demonstrate good abilities in identifying information needs and gathering information, but some limitations are observed in evaluating the credibility and accuracy of AI-generated information. This suggests that while AI can support access to information, it does not automatically ensure critical thinking skills. Therefore, information literacy remains an essential competency that must be developed alongside technological adoption.

When compared with previous studies, the findings of this research are consistent with several prior works. Addin (2025) found that Gemini AI contributes to improving students' digital and visual literacy, although it requires critical awareness in its use. Similarly, Wulandari and Asmara (2025) reported that students have positive perceptions of AI tools due to their efficiency in information retrieval, but they still question the accuracy of the information produced. In addition, Galagala and Bacarrisas (2025) demonstrated that AI usage has a significant positive effect on students' digital literacy skills in higher education. These studies support the current findings, indicating that AI technologies can enhance students' literacy competencies. However, the present study differs by specifically focusing on information literacy and integrating the Technology Acceptance Model with the Seven Pillars of Information Literacy, providing a more comprehensive analysis of both technological and cognitive aspects.

The findings of this study have both theoretical and practical implications. Theoretically, this research contributes to the development of knowledge by integrating TAM and information literacy theory in the context of AI usage in higher education. It shows that technology acceptance is not only related to usage behavior but also influences cognitive competencies such as information literacy. Practically, the results suggest that educators and academic institutions should encourage the use of AI tools like Gemini AI while simultaneously strengthening students' critical evaluation skills. Training programs or instructional strategies that focus on information literacy are necessary to ensure that students can use AI responsibly and effectively.

Despite its contributions, this study has several limitations. First, the sample size is limited to 73 students from a single study program, which may affect the generalizability of the findings. Second, the use of a questionnaire as the primary data collection instrument may introduce response bias, as the data rely on self-reported perceptions. Third, the study focuses only on Gemini AI usage without considering other AI tools that may also influence information literacy. Additionally, external factors such as students' prior knowledge, digital skills, and learning environments were not controlled in this study. These limitations suggest that future research should involve larger and more diverse samples, use mixed methods approaches, and consider additional variables to obtain more comprehensive results.

Overall, the discussion confirms that Gemini AI usage plays a significant role in enhancing students' information literacy, but its effectiveness depends on the users' ability to critically evaluate the information obtained.

CONCLUSION

This study concludes that the use of Gemini AI has a significant and positive effect on the information literacy of students in the Library and Information Science Study Program. The findings indicate that students who frequently use Gemini AI demonstrate better abilities in identifying information needs, accessing relevant sources, and utilizing information for academic purposes. This supports the research objective and confirms that AI-based tools can enhance students' efficiency and effectiveness in information-related tasks. However, the study also reveals that although students perform well in accessing and gathering information, their ability to critically evaluate the accuracy and credibility of AI-generated information still requires improvement. Therefore, the integration of AI in

academic activities must be accompanied by strong information literacy skills to ensure responsible and critical use of information.

In terms of scientific contribution, this study provides both theoretical and practical value. Theoretically, it contributes to the integration of the Technology Acceptance Model (TAM) and the Seven Pillars of Information Literacy, demonstrating that technology acceptance not only influences usage behavior but also impacts cognitive competencies such as information literacy. Methodologically, the study offers a quantitative approach to examining the relationship between AI usage and information literacy within a specific academic context. Practically, the findings highlight the importance of combining AI adoption with information literacy education, suggesting that educators should guide students in critically evaluating AI-generated information. For future research, it is recommended to involve larger and more diverse samples, apply mixed-method approaches to gain deeper insights, and explore additional variables such as digital literacy, critical thinking skills, and the use of different AI platforms to better understand their impact on students' learning outcomes.

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