Solo Universal Journal of Islamic Education and Multiculturalism
E-ISSN: 2988-3520
Vol.3, No.03, 2025, pp. 513-528
DOI: https://doi.org/10.61455/sujiem.v3i03.615

Received	Revised	Accepted
June 03, 2025	November 30, 2025	December 30, 2025

Students' Digital Literacy in the Generative AI Era

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Abstract

Objective: The development of Generative Artificial Intelligence (Generative AI) technology has brought significant changes in the learning process and access to information in the educational environment. The presence of various generative AI platforms allows students to acquire information, complete tasks, and develop creativity more quickly and efficiently. This research aims to analyze students' digital literacy levels in the Generative AI era as well as identify the factors that affect their ability to use AI technology critically, creatively, and ethically. **Theoretical framework**: This research refers to the concept of digital literacy put forward by Gilster and developed through a 21st-century digital competency framework that includes the ability to access, evaluate, create, and communicate information effectively. In addition, this study also uses an AI literacy perspective that emphasizes understanding of how it works, benefits, risks, and ethical implications of the use of artificial intelligence in daily life. **Literature review**: shows that Generative AI has great potential in improving learning experiences, but also risks lowering critical thinking skills if its use is not accompanied by adequate digital literacy. **Method**: This study used a quantitative approach with a survey method of high school students. Data were collected through questionnaires that measured aspects of digital literacy, frequency of use of AI, information verification capabilities, digital ethical awareness, and attitudes towards AI technology. The data were analyzed using descriptive statistics and correlation analysis to determine the relationship between the use of Generative AI and students' digital literacy levels. **Results**: The study showed that most students had a level of digital literacy in the medium to high category. The ability to access information and use technology is relatively good, but the ability to evaluate information and understand the ethics of using AI is still relatively low. In addition, a positive relationship was found between the intensity of use of Generative AI and the improvement of digital skills, although excessive use has the potential to reduce learning independence. These findings indicate the need to integrate digital literacy education and AI literacy in school curricula. **Implications**: This study confirms the importance of developing learning programs that focus not only on technological skills, but also on critical thinking skills, digital ethics, and responsibility in the use of AI. **Novelty**: The research lies in integrating the concepts of digital literacy and AI literacy in the context of high school students in the era of Generative AI, which is still relatively limited as studied in previous research.

Keywords: digital literacy, generative ai, students, ai literacy, digital education.

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INTRODUCTION

The development of digital technology in recent years has brought very significant changes in various aspects of life, including the field of education. One of the innovations that is currently a global concern is Generative Artificial Intelligence (Generative AI), which is artificial intelligence technology that is able to generate various forms of content, such as text, images, audio, and video, based on user commands [1]. The presence of this technology has changed the way students obtain information, complete assignments, and interact with learning resources. Various AI-based platforms, such as chatbots and intelligent learning applications, provide easy access to knowledge quickly and efficiently. However, behind these benefits, new challenges arise that require students to have adequate digital literacy skills in order to be able to use technology critically, ethically, and responsibly [2].

Digital literacy is no longer understood simply as the ability to use technological devices, but also includes the ability to access, evaluate, manage, create, and communicate information through digital media. Gilster defines digital literacy as the ability to understand and use information from various digital sources effectively [3]. In the context of 21st-century education, digital literacy is one of the important competencies that students must have to deal with increasingly complex technological developments. This ability is needed so that students not only become consumers of information, but also are able to think critically about the information received and produce useful and responsible content [4].

The emergence of Generative AI technology has further expanded the scope of digital literacy. Nowadays, students can get instant answers to various questions, create material summaries, translate texts, and even compose papers with the help of AI. This convenience has the potential to increase the effectiveness of learning if used appropriately [5]. However, the use of AI that is not accompanied by information evaluation capabilities can pose various risks, such as the dissemination of inaccurate information, plagiarism, technology dependence, and decreased critical thinking skills. Therefore, digital literacy in the era of Generative AI is not only related to technical skills, but also includes an understanding of digital ethics, data security, and the ability to verify the information generated by AI systems [6].

Various studies show that the use of digital technology has a significant influence on the learning process of students. Research conducted by UNESCO confirms that the use of digital technology can increase access to education and support more personalized learning [7]. Meanwhile, a number of recent studies on Generative AI show that the technology is able to help students understand subject matter, increase creativity, and speed up the process of completing academic assignments. However, other research has also found that excessive use of AI can reduce students' analytical abilities and learning independence [8]. The findings show that the benefits of AI technology are highly dependent on the user's level of digital literacy.

Although many studies on digital literacy have been conducted, most research still focuses on the use of the internet, social media, and digital devices in general. Research that specifically examines students' digital literacy in the context of the use of Generative AI is still relatively limited, especially in secondary education environments. In fact, the rapid development of AI has presented new challenges that are different from previous digital technologies [9]. Students are not only required to be able to search for information, but also must understand how the information is generated, recognize potential biases contained in AI systems, and be able to use the technology ethically and responsibly [10].

Based on these conditions, there is a need to assess the level of digital literacy of students in the Generative AI era as well as the factors that affect their ability to utilize this technology. This study is important because good digital literacy skills can help students get the maximum benefit from technological developments while minimizing various risks that may arise. In

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addition, the results of the research are expected to provide an overview of students' readiness to face the increasingly growing artificial intelligence-based education transformation [11].

This study aims to analyze the level of students' digital literacy in the Generative AI era, identify aspects of digital literacy that have developed well and that still need strengthening, and examine the relationship between the use of AI technology and students' digital literacy skills. The novelty of this research lies in the integration of the concept Digital Literacy and AI literacy in the context of secondary education that has not been widely studied in previous research [12]. Thus, this research is expected to make a theoretical and practical contribution in the development of learning policies and strategies that are relevant to educational needs in the era of digital transformation and artificial intelligence.

LITERATURE REVIEW

Digital Literacy

The term digital literacy was first introduced by Paul Gilster, who defined it as the ability to understand and use information from various digital sources effectively [13]. This concept is developing along with the rapid development of information and communication technology. Digital literacy includes not only the ability to operate technological devices, but also the ability to access, evaluate, manage, create, and communicate information through digital media responsibly.

According to Bawden, digital literacy is a combination of technical skills, critical thinking skills, and understanding of digital information [14]. A person who has good digital literacy is not only able to use technology, but also can assess the credibility of information sources and understand the impact of the use of technology on social and cultural life [15].

Furthermore, UNESCO explained that digital literacy is one of the important competencies of the 21st century that supports lifelong learning skills. Digital literacy allows individuals to actively participate in the digital society, both in the educational, economic, and social fields [16].

In the context of education, digital literacy is an ability that students must have to face the challenges of modern learning. These abilities include searching for information, evaluating sources, utilizing learning technology, and the ability to produce quality digital content [17]. Therefore, digital literacy is no longer seen as an additional skill, but rather as a basic need in the learning process.

Digital Literacy Dimension

Various experts put forward different dimensions of digital literacy [18]. According to Gilster, there are four main competencies in digital literacy, namely:

a. Internet Searching: The ability to search and find information through the internet effectively and efficiently.

b. Hypertext Navigation: The ability to understand the interconnected structure of digital information through links and information networks.

c. Content Evaluation: The ability to evaluate the quality, validity, and credibility of information found on the internet.

d. Knowledge Assembly: The ability to integrate a variety of information from different sources to build new knowledge.

Meanwhile, the European Commission, through the DigComp Framework, groups digital literacy into five main areas:

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1. Information and Data Literacy
2. Communication and Collaboration
3. Digital Content Creation
4. Safety
5. Problem Solving

These five dimensions are important indicators in measuring a person's level of digital literacy in the modern technology era.

Digital Literacy Theory in Education

In the world of education, digital literacy is closely related to the theory of constructivism put forward by Jean Piaget and Lev Vygotsky. The theory of constructivism explains that knowledge is actively built by learners through experience and interaction with the environment [19]. Digital technology provides opportunities for students to explore various sources of information, discuss online, and develop understanding through a broader learning experience. From the perspective of constructivism, technology serves as a means that helps students build knowledge independently [20].

In addition, the theory of Connectivism put forward by George Siemens is also relevant in understanding digital literacy. This theory emphasizes that learning in the digital era occurs through interconnected information networks. The ability to find, select, and connect information is a key skill in the modern learning process [21].

Generative Artificial Intelligence (Generative AI)

Generative Artificial Intelligence (Generative AI) is a branch of artificial intelligence that is able to generate new content based on previously learned data. This technology utilizes machine learning algorithms (*machine learning*) and artificial neural networks (*neural networks*) to generate text, images, audio, video, or program code [22].

According to Dwivedi et al., Generative AI is a system that is able to produce new outputs that resemble human work through the process of analyzing large amounts of data. The development of this technology is increasingly rapid with the presence of various AI-based platforms that can be widely used in the field of education [23]. Generative AI's ability to generate information quickly provides a great opportunity for the world of education. Students can use AI to obtain material explanations, compile summaries, translate texts, and get help in the independent learning process.

However, this technology also has various limitations. AI can generate inaccurate information (*hallucinations*), contain bias, or display information that is not appropriate for context [24]. Therefore, the use of Generative AI requires adequate digital literacy capabilities so that users are able to verify the information obtained.

Generative AI in the World of Education

The use of Generative AI in education has become a topic that has been widely discussed in recent years [25]. Various studies show that AI is able to increase the effectiveness of learning through the personalization of materials and the provision of feedback quickly. According to Kasneci et al., Generative AI can help students understand complex concepts through the presentation of simpler and more interactive information. In addition, this technology is also able to increase learning motivation because it provides a more flexible learning experience [26].

On the other hand, some studies show that there are risks to using AI in education. Over-reliance on AI can reduce students' critical thinking skills and creativity. In addition, the use

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of AI without supervision also has the potential to increase academic plagiarism practices. Therefore, the integration of Generative AI in education must be accompanied by strengthening digital literacy and technology use ethics [27].

AI Literacy

As artificial intelligence technology develops, a new concept has emerged known as AI Literacy. According to Long and Magerko, AI literacy is a set of competencies that allow individuals to understand the basic principles of AI, recognize its capabilities and limitations, and use the technology critically and responsibly [28].

AI literacy includes several important aspects, including:

1. Understanding of basic AI concepts
2. Ability to use AI effectively
3. Ability to evaluate AI-generated results
4. Awareness of AI ethics and bias
5. Understanding the social impact of AI use

In the context of education, AI literacy complements digital literacy because students not only use technology, but also understand how it works and the implications of using it [29].

The Relationship between Digital Literacy and Generative AI

Digital literacy and Generative AI have a very close relationship. The higher a person's level of digital literacy, the greater their ability to utilize AI effectively and responsibly [30]. According to Ng et al., the ability to evaluate information is a key component that determines the success of using AI technology. Individuals with good digital literacy tend to be able to identify valid information and avoid errors that AI systems may generate.

Conversely, low digital literacy can cause users to receive AI information without verification. This condition has the potential to lead to the spread of misinformation and increase dependence on technology [31].

Previous Research

Research by Ng shows that digital literacy has a positive influence on students' ability to utilize digital learning technology. The results showed that students with high levels of digital literacy were better able to evaluate information and use technology productively [32].

Research by Kasneci et al. found that the use of Generative AI in education can increase learning effectiveness, but requires supervision and strengthening critical thinking skills [33]. Meanwhile, Dwivedi et al.'s research confirms that the development of generative AI has brought a major transformation in the world of education, but it also presents challenges related to ethics, privacy, and the validity of information.

Based on these various studies, it can be concluded that digital literacy is an important factor in determining the success of the use of Generative AI in education. However, studies that specifically integrate digital literacy and AI literacy in high school students are still relatively limited. Therefore, this study seeks to fill this gap by analyzing the level of digital literacy of students in dealing with the development of Generative AI and its implications for the learning process [34].

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Table 1. Relevant Previous Research

Researcher	Research Title	Method	Research Results
Gilster	Digital Literacy	Kajian Teoretis	Digital literacy includes the ability to understand and use information from digital sources effectively.
Bawden	Origins and Concepts of Digital Literacy	Literature Studies	Digital literacy is not only a technical skill but also the ability to think critically about digital information.
Ng	Can We Teach Digital Literacy?	Conceptual Studies	Digital literacy consists of technical, cognitive, and social-emotional aspects that are interrelated.
Long & Magerko	What is AI Literacy?	Literature Studies	AI literacy includes understanding AI concepts, evaluating AI outcomes, and ethical awareness in its use.
Kasneci et al.	ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education	Literature Studies	Generative AI can improve learning effectiveness, but it has the potential to lead to dependency and ethical issues.
Dwivedi et al.	So What if ChatGPT Wrote It?	Comprehensive Review	Generative AI brings a major transformation in education and requires adequate regulation and digital literacy.
UNESCO	Guidance for Generative AI in Education and Research	Policy Document	The use of AI in education must be accompanied by strengthening digital literacy, ethics, and data security.
Chiu	The Impact of Generative AI on Education	Literature Review	Generative AI has the potential to increase students' creativity but requires critical thinking skills to verify information.

Previous research traces the structural evolution of digital literacy from basic critical thinking concepts to AI literacy, emphasizing that Generative AI enhances student learning while demanding critical evaluation, ethical awareness, and data security

Research Gap

Based on various previous studies, studies on digital literacy have been widely conducted in the context of the use of the internet, social media, and digital learning technology. On the other hand, research on Generative AI in education also shows that the technology has great potential in increasing learning effectiveness, creativity, and access to information [35]. Nevertheless, most studies still examine digital literacy and Generative AI as two stand-alone concepts. Research that specifically integrates digital literacy and AI literacy in the context of the use of Generative AI by high school students is still relatively limited. In addition, there has not been much research that highlights students' ability to evaluate the accuracy of AI-generated information, understand the ethical implications of its use, and develop critical attitudes towards artificial intelligence technology. In fact, the increasingly rapid development of Generative AI requires students not only to be able to use digital technology, but also to understand how it works, benefits, risks, and impacts on the learning process.

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Therefore, research is needed that examines the level of digital literacy of students in the Generative AI era more comprehensively to fill the research gap that still exists [36].

Research Novelty

The novelty of this research lies in the effort to integrate the concept of digital literacy and AI literacy in one study framework that focuses on high school students as active users of Generative AI technology. This research not only measures students' ability to access and use digital technology, but also analyzes their ability to evaluate AI-generated information, understand aspects of digital ethics, and use technology critically and responsibly. Thus, this research is expected to make a new contribution to the development of digital literacy studies in the era of artificial intelligence as well as the basis for the development of learning strategies that are relevant to the needs of 21st-century education [37].

Frame of Mind

The development of Generative AI has changed the way students access and utilize information in the learning process. The convenience offered by this technology provides opportunities to increase learning effectiveness, creativity, and academic productivity. However, the optimal use of Generative AI requires an adequate level of digital literacy. Digital literacy allows students to access information effectively, evaluate the correctness of information, understand aspects of digital ethics, and use technology responsibly. The higher the level of digital literacy that students have, the better their ability to utilize Generative AI as a means of learning. On the other hand, low digital literacy can lead to dependence on technology, errors in receiving information, and misuse of AI technology [38]. Therefore, this study assumes that the use of Generative AI has a relationship with students' digital literacy levels, so an analysis is needed to find out how students utilize the technology in learning activities.

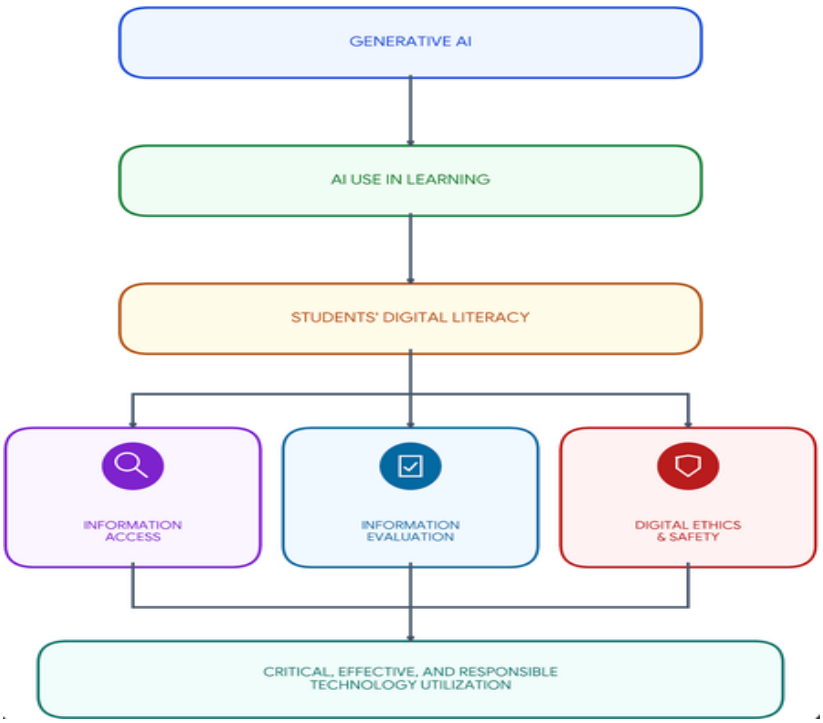


Figure 1. Student Digital Literacy Research Thinking Framework in the Generative AI Era

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This flowchart illustrates how Generative AI in learning strengthens students' digital literacy through information access, evaluation, and safety ethics, ultimately achieving critical, effective, and highly responsible technology utilization in our modern education systems.

METHODOLOGY

Types of Research

This study uses a quantitative approach with a descriptive survey method. The quantitative approach was chosen because the research aims to measure and describe the level of digital literacy of students in the Generative Artificial Intelligence (AI) era based on numerical data obtained from respondents. The survey method is used to obtain direct information about students' ability to access, understand, evaluate, and utilize digital information as well as the use of AI technology in learning activities [39].

This research is descriptive because it focuses on exposing the actual conditions of students' digital literacy without giving certain treatment to the respondents. In addition, the study also used a correlational approach to see the relationship between the use of Generative AI and students' digital literacy levels.

Population and Sample

The population in this study is all high school students who have used digital devices and have access to the internet in learning activities. The population was chosen because students are the group that most actively interacts with digital technology and various artificial intelligence-based applications.

The research sample was determined using the purposive sampling technique, which is a sampling technique based on certain criteria that are in accordance with the research objectives [40]. The respondent criteria include:

1. Students are active at the secondary school level.
2. Have used the internet for learning activities.
3. Have used or are familiar with Generative AI-based applications.
4. Willing to be a research respondent.

The number of research samples is adjusted to the needs of the research. In this study, as many as 100 respondents were used who were considered able to represent population characteristics.

Research Instruments

The instrument used in this study is a questionnaire prepared based on digital literacy and AI literacy indicators [41]. The questionnaire uses a five-level Likert scale, namely:

Table 2. Scoring criteria and response categories of the five point Likert scale for research questionnaire analysis.

Score	Category
5	Strongly agree
4	Agree
3	Hesitation
2	Disagree

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1	Strongly disagree

The research instrument consists of several indicators as follows:

a. Digital Literacy

1. Ability to access digital information.
2. Ability to search for information through the internet.
3. Ability to evaluate the correctness of information.
4. Ability to use digital technology effectively.
5. Ability to create and share digital content.
6. Awareness of digital security and ethics.

b. AI Literacy

1. Basic understanding of Generative AI.
2. The ability to use AI in learning.
3. The ability to evaluate AI-generated results.
4. Awareness of the risks and limitations of AI.
5. Understanding the ethics of using AI in education.

Before use, the research instrument is tested for validity and reliability. The validity test was carried out using Product Moment correlation, while the reliability test used Cronbach's Alpha, provided that the alpha value of ≥ 0.70 indicated a reliable instrument [42].

Data Collection Techniques

Data collection is carried out through several stages as follows:

a. Questionnaire (Questionnaire): Questionnaires are used as the main instrument to obtain data on students' digital literacy levels and the use of Generative AI in learning activities. The questionnaire was distributed online using digital platforms and directly to respondents.

b. Documentation: Documentation techniques are used to obtain supporting data related to the research, such as school profiles, number of students, and various documents relevant to the use of digital technology in learning.

c. Literature Studies: Literature studies are carried out by examining various books, scientific journals, research reports, and official documents related to digital literacy, AI literacy, and the use of Generative AI in education. Data from the literature study is used to strengthen the theoretical foundation and discussion of the research.

Data Analysis Techniques

The data obtained were analyzed using descriptive and inferential statistical techniques.

a. Descriptive Statistical Analysis

Descriptive analysis is used to describe students' digital literacy levels through:

1. Frequency
2. Percentage
3. Mean value
4. Standard deviation

This analysis aims to find out the categories of students' digital literacy levels, both low, medium, and high.

b. Pearson Correlation Analysis

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Pearson's correlation analysis was used to determine the relationship between the use of Generative AI and students' digital literacy levels. Pearson's correlation formula is:

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2][n\sum Y^2 - (\sum Y)^2]}}$$

Description:

- r = correlation coefficient
- X = Generative AI usage score
- Y = digital literacy score
- n = number of respondents

The interpretation of correlation coefficients was carried out to determine the level of relationships between variables, ranging from very low to very strong.

c. Conclusion Drawing

The final stage of the research is carried out by interpreting the results of data analysis to answer the research objectives. The conclusions are compiled based on empirical findings regarding students' digital literacy levels and the relationship between the use of Generative AI and their digital literacy skills. The results of the research are then used as a basis to provide recommendations in the development of technology-based learning and strengthening digital literacy in the education environment [43].

RESULTS AND DISCUSSION

Respondent Description

This study involved 100 high school students who had used digital technology in learning activities. Respondents were selected based on the criteria of having used the internet to learn and get to know or use Generative AI-based applications. Based on the results of data collection, all respondents had experience using digital devices such as smartphones, laptops, or computers in academic activities.

In addition, most respondents admitted that they had used AI-based applications to search for information, make material summaries, translate texts, and help complete schoolwork [44]. These findings show that Generative AI technology is starting to become part of students' learning activities and potentially affect their digital literacy skills.

Students' Digital Literacy Level

Descriptive analysis shows that students' digital literacy levels are in the medium to high category. The results of the measurement of six digital literacy indicators show variations in abilities in each aspect.

Table 3. Students' Digital Literacy Level

Indicator	Red	Category
Access to Digital Information	4,35	Height
Information Search	4,21	Height
Information Evaluation	3,62	Medium
Utilization of Digital Technology	4,18	Height
Digital Content Creation	3,87	Medium
Digital Ethics and Security	3,75	Medium
Average	4,00	Height

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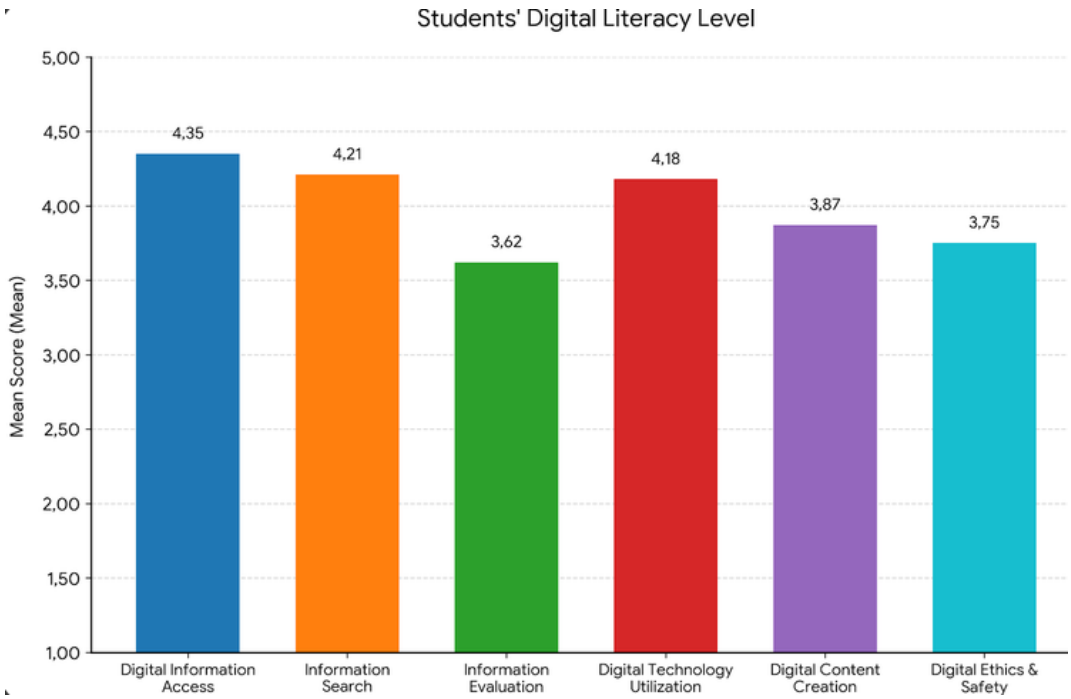


Figure 2. Students' Digital Literacy Level

Based on Table 3 and Figure 2, the digital information access indicator obtained the highest average value of 4.35, which is included in the high category. These results show that students have a good ability to access various sources of information through digital media. Furthermore, the indicators of information search and the use of digital technology also fall into the high category, with average scores of 4.21 and 4.18, respectively. Meanwhile, the information evaluation indicator obtained the lowest average score of 3.62. These findings indicate that students' ability to assess the credibility and correctness of information still needs to be improved. Overall, students' digital literacy levels are in the high category with an average score of 4.00, which shows that students have been able to utilize digital technology quite well in learning activities in the Generative AI era [45].

Students' Use of Generative AI

The results of the study show that Generative AI has been used by students in various learning activities. Most respondents use AI technology to find information, answer academic questions, make material summaries, and help with assignments.

Table 4. Purpose of Use of Generative AI

Intended Use	Percentage (%)
Searching for Information	88
Creating a Material Summary	76
Creating a Material Summary	76
Help with Tasks	72
Translating Text	65
Translating Text	65
Finding Ideas or Inspiration	61
Creating a Presentation	54

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The data shows that the main function of Generative AI for students is as a source of information and a learning aid. AI's ability to provide answers quickly is the main reason for the high level of use of this technology [46]. However, some respondents admitted that they often received information that was not in line with their needs or did not have a clear source. These findings show that the use of AI still requires the ability to evaluate information so that the results obtained can be used appropriately.

The Relationship between the Use of Generative AI and Digital Literacy

Pearson's correlation analysis was conducted to determine the relationship between the use of Generative AI and students' digital literacy levels.

Table 5. Correlation Test Results

Variabel	Correlation Value (r)	Say.
The Use of Generative AI and Digital Literacy	0,684	0,000

The results of the analysis showed a correlation value of 0.684 with a significance level of 0.000 (< 0.05). This value shows that there is a strong positive relationship between the use of Generative AI and students' digital literacy levels. These findings indicate that students who use AI technology more often tend to have better digital skills. The use of AI allows students to interact more intensively with technology, thereby improving their ability to access, manage, and utilize digital information [47]. However, such positive relationships do not mean that the use of AI always has a positive impact automatically. The benefits of AI are highly dependent on students' ability to use technology critically and responsibly.

Discussion

The results of the study show that the level of digital literacy of students is in the high category. These findings are in line with Gilster's theory, which states that digital literacy includes the ability to access and use digital information effectively. The high ability to access information shows that students are used to utilizing digital technology in their daily lives and academic activities. However, this study also found that the ability to evaluate information is still in the medium category. The findings support Bawden's view that digital literacy is not only related to the use of technology, but also the ability to think critically about the information obtained. In the context of Generative AI, this capability is becoming increasingly important because AI systems can generate information that is not always accurate [48].

The high use of Generative AI among students shows that this technology has become part of the modern learning process. These findings are in line with the research of Kasneci et al., who stated that generative AI is able to increase learning effectiveness through the provision of fast and personalized information. Students can obtain academic aid at any time without having to rely entirely on conventional learning resources. On the other hand, this study also found potential risks in the form of dependence on AI. Some students tend to accept the information provided by the AI without further verification. This condition shows that the use of AI must be balanced with strengthening digital literacy and AI literacy so that students are able to understand the limitations of these technologies.

The results of the correlation test showed a strong positive relationship between the use of Generative AI and students' digital literacy. These findings support Long and Magerko's research, which confirms that the ability to understand and use AI effectively is an important part of today's digital competencies. The more often students interact with AI technology, the greater their chances of developing the digital skills necessary in 21st-century learning [49]. Based on the results of the research, it can be understood that Generative AI has great potential in supporting the learning process if used appropriately. Therefore, schools need to develop digital literacy programs that focus not only on technical skills, but also on

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information evaluation capabilities, digital ethics, data security, and AI literacy. Thus, students can take optimal advantage of technological developments while avoiding various risks that may arise due to the unwise use of AI.

CONCLUSION

Based on the results of research on Student Digital Literacy in the Generative AI Era, it can be concluded that the level of student digital literacy is in the high category. Students have good skills in accessing digital information, searching for information through the internet, and utilizing digital technology in learning activities. However, the ability to evaluate the truth of information, create quality digital content, and understand digital ethics and security still needs to be improved. The results of the study also show that Generative AI has been widely used by students as a means of supporting learning. The technology is used to find information, make material summaries, translate texts, help complete assignments, and get inspiration in academic activities. The ease and speed that Generative AI offers make it one of the increasingly important technologies in the modern learning process. In addition, the results of the correlation analysis showed a strong positive relationship between the use of Generative AI and students' digital literacy levels. The higher the intensity of using Generative AI, the better the student's ability to utilize digital technology. However, the use of AI that is not accompanied by critical thinking skills has the potential to cause dependency and the risk of disseminating inaccurate information. Thus, digital literacy and AI literacy are very important competencies for students to have in dealing with technological developments in the era of artificial intelligence. Strengthening these two competencies is needed so that students are able to utilize technology effectively, critically, ethically, and responsibly.

Acknowledgments

The authors sincerely thank Sekolah Tinggi Ilmu Dakwah Muhammad Natsir, Ez-Zitouna University, and all participating students for their invaluable support throughout this completed research project.

Author Contribution

DNRO and LI conceptualized the study, collected data, and drafted the manuscript. MDG performed the analysis, critically reviewed, and approved the final submitted paper version.

Conflicts of Interest

The authors declare that they have no financial, personal, or professional conflicts of interest that could inappropriately influence or bias the findings of this study.

Use of Artificial Intelligence (AI)

Artificial intelligence tools were utilized solely for grammar checking and language editing during manuscript preparation. The authors performed all intellectual analysis and final text writing.

Funding

This research received financial funding from Sekolah Tinggi Ilmu Dakwah Muhammad Natsir Surakarta for conducting the study titled Students' Digital Literacy in Generative AI Era.

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