West Science Interdisciplinary Studies
Vol. 4, No. 10, October 2026: pp. 1550-1560

The Role of Artificial Intelligence in Mediating the Influence of Language Literacy on the Academic Writing Skills of Politeknik Negeri Ambon Students

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ABSTRACT

This study aims to analyze the influence of Language Literacy on Academic Writing Ability with Artificial Intelligence as a mediating variable in Ambon State Polytechnic students. Academic writing ability is one of the important competencies that students must have in producing quality scientific work. However, the development of Artificial Intelligence technology has changed the learning patterns and academic writing processes of students. This study uses a quantitative approach with a survey method. The study population was Ambon State Polytechnic students, with a sample of 50 respondents determined using a purposive sampling technique. Data were collected through questionnaires and analyzed using Structural Equation Modeling (SEM) based on Partial Least Square (PLS) with the help of SmartPLS 4. The results of the study indicate that Language Literacy has a positive and significant effect on Artificial Intelligence, Artificial Intelligence has a positive and significant effect on Academic Writing Ability, while Language Literacy has a positive but insignificant effect on Academic Writing Ability. In addition, Artificial Intelligence is proven to significantly mediate the relationship between Language Literacy and Academic Writing Ability. The results of the study indicate that Artificial Intelligence acts as a full mediator in this relationship. This finding indicates that the improvement of students' academic writing ability is not only determined by language literacy skills, but also by the ability to utilize Artificial Intelligence effectively in the learning process and academic writing.

Keywords: *Language Literacy, Artificial Intelligence, Academic Writing Skills, SmartPLS 4, Politeknik Negeri Ambon.*

1. INTRODUCTION

Academic writing skills are a crucial competency for students in higher education. These skills enable students to systematically communicate ideas, research findings, and scientific thinking in accordance with academic principles. According to [1], academic writing skills encompass not only writing skills but also the ability to develop evidence-based arguments, integrate various scientific sources, and convey ideas in a logical and structured manner. Therefore, academic writing skills are a crucial indicator of student success in completing various academic assignments, particularly research proposals and theses, which are final assignments in higher education. Despite this, students' academic writing skills remain a challenge faced by various universities. Based on initial observations of students at Ambon State Polytechnic, it was found that many still experience difficulties in the process of preparing research proposals and theses. These difficulties include understanding the content of scientific journals, finding relevant references, formulating research problems, developing a framework for thinking, developing discussions based on theories and previous research results, and formulating conclusions that align with the research results. Furthermore, ineffective use of Indonesian language, errors in citing sources, and bibliography preparation that does not comply with academic standards were still found. Observations also indicate that some students have relatively poor reading habits, making them less able to understand and critique scientific sources. This condition impacts students' ability to develop scientific ideas and arguments in academic writing. Many students experience repeated revisions to the background,

literature review, and discussion sections due to their inability to systematically integrate theory and previous research findings into their writing. This phenomenon indicates that students' academic writing skills still require attention and strengthening, particularly in terms of language literacy.

Language literacy is an individual's ability to understand, interpret, evaluate, and use information through reading and writing activities. [2] explains that language literacy relates not only to reading and writing skills but also to the ability to construct meaning, think critically, and communicate ideas effectively. Furthermore, the [3] states that literacy is the ability to understand, use, evaluate, and reflect on written information to achieve specific goals, develop knowledge, and actively participate in social life. In the context of higher education, language literacy skills are the main foundation for developing students' critical thinking and academic writing skills. The relationship between language literacy and academic writing skills can be explained through the Academic Literacy Theory proposed by [4]. This theory explains that students' success in producing academic writing is influenced by their ability to read, understand, interpret, and construct knowledge from various information sources. Students with good language literacy skills will more easily understand scientific references, develop ideas, construct arguments, and produce quality academic writing.

On the other hand, advances in information technology have brought about significant changes in the learning process and academic writing. One of the most prominent developments is the emergence of generative Artificial Intelligence (AI) tools such as ChatGPT, Gemini, Copilot, and various other AI-based platforms. This technology has transformed the way students search for information, understand material, develop ideas, and compose academic papers. Artificial Intelligence can help students obtain references more quickly, develop writing outlines, improve sentence structure, develop research ideas, and edit academic manuscripts

The use of Artificial Intelligence (AI) has also begun to emerge among students at Ambon State Polytechnic. Initial observations indicate that some students have utilized AI to assist with coursework, research proposals, and theses. However, the technology's use has yielded mixed results. Some students are able to effectively use AI to support their academic writing, while others struggle to verify AI-generated information, evaluate the credibility of sources, and develop AI output into academic writing that meets scientific standards. This demonstrates that the success of AI utilization is not solely determined by the technology itself, but also by students' language literacy skills.

The use of Artificial Intelligence in education can be explained through the Technology Acceptance Model (TAM) developed by [5]. This theory explains that a person will use a technology if it is perceived to be useful (perceived usefulness) and easy to use (perceived ease of use). In the context of higher education, students who perceive the benefits of Artificial Intelligence in assisting with information retrieval, idea development, and academic writing tend to utilize the technology more intensively. Recent research shows that Artificial Intelligence has great potential in supporting the learning process and academic writing. [6] explained that generative Artificial Intelligence can help students find information, understand learning materials, develop ideas, and increase academic productivity. The results of research by [7] also show that the use of Artificial Intelligence can increase learning effectiveness and support academic activities when used appropriately and responsibly. Furthermore, [8] found that Artificial Intelligence has the potential to improve the quality of students' learning process by supporting information searches and academic content development. Several previous studies have shown that language literacy positively influences

students' academic writing skills [3], [9]. Other studies have also found that Artificial Intelligence positively influences learning effectiveness and students' academic writing skills [6], [8]. However, most of these studies only examine the direct relationship between language literacy and academic writing skills or between the use of Artificial Intelligence and student learning outcomes. Research integrating these three variables into a single research model is still relatively limited, particularly in vocational education settings. The limitations of previous research indicate a research gap. Furthermore, few studies have explained the mechanisms by which language literacy can improve academic writing skills through the use of Artificial Intelligence. In other words, there remains a theoretical gap regarding the process that explains the relationship between language literacy and students' academic writing skills in the era of artificial intelligence. Artificial Intelligence was chosen as a mediating variable in this study because it theoretically functions as a mechanism that bridges the relationship between language literacy and academic writing skills. Baron and Kenny (1986) explain that a mediating variable is used to explain the process or mechanism by which an independent variable influences a dependent variable. In this study, students with good language literacy will be better able to critically and responsibly understand, evaluate, and utilize information generated by Artificial Intelligence. This ability will ultimately help students improve their academic writing skills. Thus, Artificial Intelligence functions not only as a technological tool but also as a means of strengthening the influence of language literacy on students' academic writing skills. The novelty of this research lies in examining the role of Artificial Intelligence as a mediating variable in the relationship between language literacy and students' academic writing skills in a vocational education environment, particularly at Ambon State Polytechnic. Research on the integration of language literacy and Artificial Intelligence in improving academic writing skills is still relatively limited, especially in universities in Eastern Indonesia. Therefore, this research is expected to provide theoretical contributions to the development of language literacy and educational technology studies, as well as provide practical contributions for universities in designing strategies to improve students' academic writing skills in the era of artificial intelligence.

2. LITERATURE REVIEW

2.1 Language Literacy

Language literacy is a person's ability to understand, interpret, evaluate, and use information through reading and writing. Language literacy encompasses not only the technical skills of reading and writing, but also the ability to think critically, comprehend meaning, and communicate ideas effectively in various contexts.

According to [2], language literacy is an individual's ability to construct meaning through reading, writing, speaking, and critical thinking within social and academic contexts. Meanwhile, the [3] defines literacy as the ability to understand, use, evaluate, and reflect on written information to achieve goals, develop knowledge, and actively participate in society.

In contextIn higher education, language literacy is a key foundation for developing students' academic abilities. Students with strong language literacy skills will more easily understand scientific sources, identify important information, develop ideas, and compose systematic academic writing. Research by [10] shows that language literacy positively influences students' academic writing skills. The results indicate that the

higher students' reading and writing skills, the better their ability to produce quality academic work.

Language Literacy Indicators [2]**:**

1) Ability to understand scientific reading.
2) The ability to find the main idea in reading.
3) The ability to critically evaluate information.
4) The ability to develop ideas based on the information obtained.
5) The ability to write systematically and logically.
6) The ability to use good and correct Indonesian in academic writing.

2.2 Artificial Intelligence

Artificial Intelligence (AI) is a technology that enables computer systems to mimic human thinking in processing information, analyzing data, solving problems, and producing content. In education, AI has become an innovation that supports learning, information retrieval, and academic writing.

The use of Artificial Intelligence in this study is based on the Technology Acceptance Model (TAM) developed by [5]. This theory explains that someone will use technology if the technology is perceived as useful (perceived usefulness) and easy to use (perceived ease of use).

[6] explain that generative artificial intelligence (AI) like ChatGPT can help students find references, understand material, develop writing ideas, develop writing outlines, and improve academic grammar. Furthermore, [7] state that generative AI offers significant opportunities to improve learning effectiveness and student academic productivity. In researchIn this context, Artificial Intelligence is seen as a tool that helps students optimize their academic reading and writing skills through the effective and responsible use of technology.

Artificial Intelligence Indicators [5]**:**

1) The intensity of AI use in academic activities.
2) Ease of use of AI.
3) Benefits of AI in information retrieval.
4) Utilization of AI in developing writing ideas.
5) Utilization of AI in language editing.
6) The effectiveness of AI in supporting academic writing.

2.3 Academic Writing Skills

Academic writing skills are a person's ability to convey ideas, thoughts, and research findings logically, systematically, and objectively, in accordance with scientific writing principles. According to [1], academic writing is the process of developing evidence-based arguments and communicating knowledge in accordance with applicable academic conventions. Meanwhile, [11] explains that academic writing is the activity of expressing ideas in writing based on systematic and accountable scientific principles. Academic writing skills are a crucial competency for students, as they directly relate to the development of research proposals, scientific articles, academic reports, and theses. Students with strong academic writing skills tend to be able to compose scientific papers in a more structured and high-quality manner.

Research by [9] showed that reading ability and academic literacy have a positive relationship with students' academic writing skills. These results indicate that academic writing skills develop through a continuous process of reading, understanding, and processing information.

Academic Writing Ability Indicators [12]**:**

1) Ability to structure academic writing.
2) Ability to formulate research problems.
3) Ability to develop scientific arguments.
4) Ability to integrate references in writing.
5) Ability to use appropriate academic language.
6) Ability to compile citations and bibliographies according to scientific principles.

2.4 Relationship Between Variables

2.4.1 The Influence of Language Literacy on Artificial Intelligence

According to [2], language literacy encompasses not only the ability to read and write, but also the ability to understand, interpret, evaluate, and use information critically. In the context of digital technology development, language literacy skills are essential for students to utilize Artificial Intelligence (AI) effectively. Students with good language literacy will be better able to understand instructions (prompts), evaluate the quality of information generated by AI, and utilize AI output appropriately in academic activities.

The Technology Acceptance Model (TAM) theory proposed by [5] explains that individuals will more easily accept and utilize technology if they have sufficient skills to understand its benefits and how to use it. Therefore, students with high levels of language literacy tend to be better able to optimize the use of AI in information retrieval, idea development, and academic assignment completion.

Research by [6] shows that literacy and critical thinking skills are important factors in determining the effectiveness of AI technology utilization in educational settings. Research by [8] also found that students who have the ability to understand and evaluate information well are better able to utilize AI optimally to support the learning process. These findings indicate that language literacy plays a crucial role in enhancing students' utilization of Artificial Intelligence.

2.4.2 The Influence of Language Literacy on Academic Writing Ability

According to [4], through their Academic Literacy Theory, academic writing skills develop through the process of reading, understanding, interpreting, and constructing knowledge. Language literacy is the primary foundation for producing systematic, logical, and evidence-based academic writing. Students with good language literacy skills will more easily understand various reference sources, develop ideas, and structure scientific arguments appropriately.

[2] also explained that language literacy plays a role in developing critical thinking skills and the ability to communicate ideas in writing. The better a person's language literacy skills, the better their ability to compose quality scientific papers. Research by [13] showed that academic literacy has a positive influence on the quality of students'

academic writing. Research by [1] also found that the ability to understand text and manage information is an important factor in improving academic writing skills. Furthermore, research by [14] showed that the ability to read and understand scientific sources contribute to the quality of argumentation and the structure of students' academic writing.

2.4.3 The Influence of Artificial Intelligence on Academic Writing Skills

According to [5], technology that is perceived as useful and easy to use will improve user performance. In the context of higher education, artificial intelligence can be used to help students obtain information, generate writing ideas, improve sentence structure, edit grammar, and enhance the quality of academic writing.

The use of AI in academic writing enables students to work more efficiently in developing ideas and composing systematic writing. AI also helps students obtain rapid feedback on their writing, allowing for more effective revision. Research by [6] shows that the use of generative AI can assist students in the process of writing, developing ideas, and editing academically. Research by [15] found that the use of ChatGPT positively contributed to the productivity and effectiveness of students' academic writing. Research by [16] also shows that AI can support improving the quality of academic writing by assisting with writing structure, argument development, and language refinement.

2.4.4 The Role of Artificial Intelligence as a Mediating Variable

According to [17], a mediating variable serves to explain the process or mechanism by which an independent variable influences a dependent variable. In this study, Artificial Intelligence (AI) is positioned as a bridging variable in the relationship between language literacy and academic writing skills. Students with good language literacy tend to be better able to understand instructions, evaluate information, and utilize AI critically. These abilities enable students to derive greater benefits from the use of AI in academic activities. Furthermore, effective use of AI helps students develop ideas, structure their writing, refine their language, and improve the quality of their academic work.

Research by [6] shows that the benefits of AI in education are greatly influenced by users' literacy skills in understanding and evaluating information generated by AI systems. Research by [8] also found that digital literacy and language literacy skills play a crucial role in maximizing the use of AI to support learning and academic writing. Furthermore, research by [16] shows that the use of AI can be an effective tool for improving academic skills if supported by adequate literacy competencies.

3. METHODS

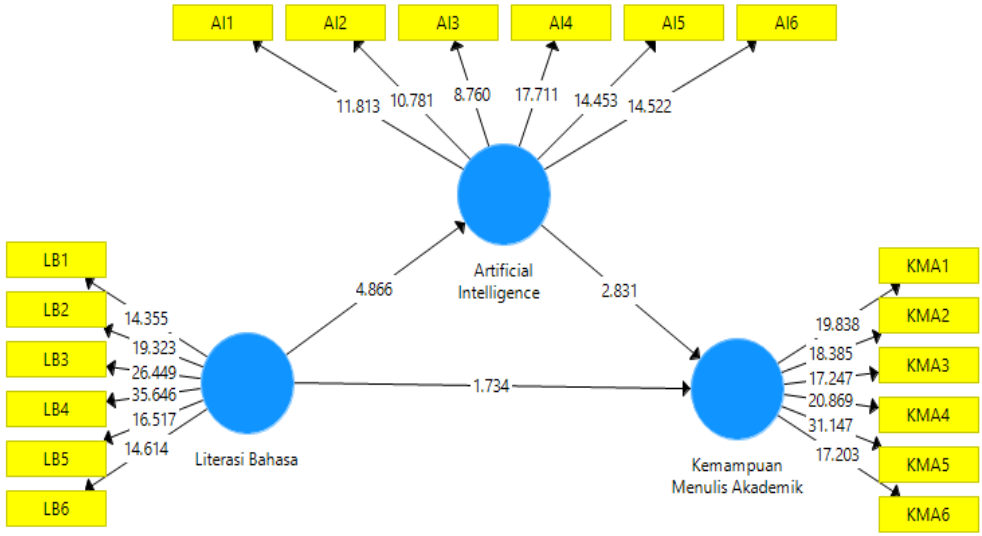
The population in this study were students of the Business Administration Study Program who were currently writing their theses and had previously utilized Artificial Intelligence in their academic activities. The population of 50 students was the object of this study. Due to the relatively small population, this study used a saturated sampling technique (census), where all members of the population were used as samples. According to [18], saturated sampling is a sampling technique

where all members of the population are used as samples. Therefore, the sample size in this study was 50 students.

4. RESULTS AND DISCUSSION

4.1 Hypothesis Testing

Hypothesis testing in this study was conducted using the bootstrapping method in the SmartPLS 4.0 application. This test aims to determine the significance of the influence between the studied variables, both direct and indirect influences through mediating variables. The hypothesis testing criteria were based on t-statistics > 1.96 and p-values < 0.05 at a 5% significance level. The bootstrapping test results are shown in Figure 1 below.



Source: Processed Primary Data, 2026

Based on the bootstrapping results in Figure 1, it can be seen that not all relationships between variables have a t-statistic value above 1.96. The effect of Language Literacy on Artificial Intelligence has a t-statistic value of 4.866, while the effect of Artificial Intelligence on Academic Writing Ability has a t-statistic value of 2.831. These results indicate that Language Literacy has a significant effect on Artificial Intelligence and Artificial Intelligence has a significant effect on Academic Writing Ability.

Furthermore, the influence of language literacy on academic writing ability has a t-statistic value of 1.734. This value is smaller than 1.96, indicating that language literacy does not have a direct, significant effect on academic writing ability. This finding indicates that students' language literacy skills do not directly improve academic writing skills, but they play a role in increasing the use of artificial intelligence, which ultimately supports academic writing skills. Based on the results of the bootstrapping test, it can be concluded that the relationship between Language Literacy and Artificial Intelligence and Artificial Intelligence on Academic Writing Ability is proven significant. Meanwhile, the direct relationship between Language Literacy and Academic Writing Ability is not significant. These results indicate that Artificial Intelligence plays an important role as a mediating variable that bridges the influence of Language Literacy on Academic Writing Ability. Students who have good language literacy skills tend to be more able to utilize Artificial Intelligence effectively to search for information, develop ideas, improve writing structure, and edit academic language, thereby improving academic writing skills more optimally.

If the results of the Specific Indirect Effect test show a t-statistics value greater than 1.96 and a p-value less than 0.05, then it can be stated that Artificial Intelligence mediates the influence of

Language Literacy on Academic Writing Ability, even potentially as a full mediation because the direct relationship between Language Literacy and Academic Writing Ability is not significant.

4.2 Direct Effect Testing

Table 1. Results of Path Coefficient Bootstrapping Direct Effect

Relationship between variables	Original Sample (O)	T Statistics	P Values	Information
Language Literacy for Artificial Intelligence	0.505	4,866	0,000	Proven
Artificial Intelligence on Academic Writing Skills	0.372	2,831	0.005	Proven
Language Literacy on Academic Writing Skills	0.214	1,734	0.084	Not Proven

Source: Processed Primary Data, 2026

Testing Criteria:The hypothesis is proven if the T Statistics value is > 1.96 and P Values < 0.05. Based on Table 1, not all relationships between variables have T Statistics values greater than 1.96 and P Values smaller than 0.05. The test results show that Language Literacy has a positive and significant effect on Artificial Intelligence with a path coefficient value of 0.505, a T Statistics value of 4.866, and P Values of 0.000. These results indicate that the better the language literacy skills of students, the higher their ability to utilize Artificial Intelligence in academic activities.

Furthermore, Artificial Intelligence has a positive and significant effect on Academic Writing Ability with a path coefficient value of 0.372, a T Statistics value of 2.831, and P Values of 0.005. These results indicate that the use of Artificial Intelligence can help students in obtaining information, developing ideas, improving writing structure, and increasing the quality of academic writing.

Meanwhile, Language Literacy has a positive but insignificant effect on Academic Writing Ability with a path coefficient value of 0.214, a T Statistics value of 1.734, and P Values of 0.084. These results indicate that students' language literacy abilities have not been able to directly improve academic writing abilities.

Overall, the research results indicate that language literacy plays a role in increasing the utilization of artificial intelligence, while artificial intelligence plays a role in improving academic writing skills. However, language literacy has not had a significant direct impact on academic writing skills.

4.3 Indirect Effect Testing

Table 2. Results of Path Coefficient Bootstrapping Indirect Effect

Relationship between variables	Original Sample (O)	T Statistics	P Values	Information
Language Literacy Against Academic Writing Skills through Artificial Intelligence	0.188	2,476	0.013	Proven

Source: Processed Primary Data, 2026

Testing Criteria:The hypothesis is proven if the T-Statistics value is > 1.96 and P-Values < 0.05. Based on Table 2, the indirect relationship between Language Literacy and Academic Writing Ability through Artificial Intelligence has a T-Statistics value of 2.476 and P-Values of 0.013. These values indicate that the indirect effect is positive and significant. Thus, the hypothesis stating that Artificial Intelligence mediates the relationship between Language Literacy and Academic Writing Ability is proven.

These results indicate that students with strong language literacy skills tend to be more able to utilize Artificial Intelligence effectively. These skills then help students acquire information, develop ideas, construct arguments, and improve the quality of their academic writing, thus improving their academic writing skills.

Overall, the research results indicate that Artificial Intelligence acts as a mediating variable in the relationship between Language Literacy and Academic Writing Ability. However, because the direct effect of Language Literacy on Academic Writing Ability was insignificant, while the indirect effect was significant, Artificial Intelligence is categorized as a full mediator. This condition indicates that the influence of Language Literacy on Academic Writing Ability is channeled more through the use of Artificial Intelligence than through direct influence.

4.4 Discussion

4.4.1 The Influence of Language Literacy on Artificial Intelligence

The results of the study indicate that language literacy has a positive and significant impact on artificial intelligence. This finding aligns with research by [6], which states that the success of utilizing artificial intelligence in education is greatly influenced by the user's ability to understand information, formulate clear instructions, and evaluate the results provided by the AI system. Students with strong literacy skills tend to be more effective in utilizing AI technology to support learning and academic writing. Research by [7] also found that user literacy is a crucial factor in determining the effectiveness of Artificial Intelligence (AI) use. The higher a person's literacy skills, the better their ability to utilize AI technology to obtain information and complete academic tasks.

4.4.2 The Influence of Artificial Intelligence on Academic Writing Skills

The research results show that Artificial Intelligence has a positive and significant effect on academic writing skills. This finding aligns with research by [15], which found that using ChatGPT can help students develop ideas, improve grammar, enhance writing quality, and accelerate the academic writing process. [19] research also shows that the use of Artificial Intelligence has a positive impact on students' writing skills because this technology can help with the preparation of writing frameworks, argumentation development, and improvement of academic sentence structures.

In addition, research by [20] found that Artificial Intelligence contributes to improving the productivity and quality of students' academic writing by supporting information searches and more systematic compilation of academic content.

4.4.3 The Influence of Language Literacy on Academic Writing Ability

The results of the study indicate that language literacy has a positive but insignificant effect on academic writing skills. This finding differs from [1] study, which stated that literacy skills are a crucial factor in improving the quality of students' academic writing. [21] study also found that the ability to read and comprehend information contributes to writing skills by helping students develop ideas and structure arguments logically.

However, the results of this study align with the view of [22], who explained that academic writing ability is not solely determined by language skills but is also influenced by other factors such as academic experience, learning environment, technology use, and access to knowledge sources. In the context of this study, Artificial Intelligence is a more dominant factor in supporting academic writing ability than direct language literacy. This finding is also supported by [23] research which explains that in the era of Artificial Intelligence, students' academic writing abilities are increasingly influenced by their ability to utilize digital technology rather than relying solely on conventional literacy skills.

4.4.4 The Role of Artificial Intelligence as a Mediating Variable

The research results show that Artificial Intelligence is capable of mediating the relationship between Language Literacy and Academic Writing Ability. This finding aligns with the mediation

theory proposed by [17], which explains that mediating variables function to explain the mechanism by which independent variables influence dependent variables.

The results of this study are also supported by research by [8], who found that Artificial Intelligence functions as a learning support tool that can bridge students' basic abilities with higher learning outcomes. Students with good literacy skills will find it easier to utilize AI to search for references, develop ideas, and improve the quality of academic writing. Research by [6] also found that literacy skills are a factor that strengthens the effectiveness of the use of Artificial Intelligence in education. The better a student's literacy skills, the greater the benefits gained from using AI to support the academic writing process.

CONCLUSION

Based on the results of research on the influence of Language Literacy on Academic Writing Ability with Artificial Intelligence as a mediating variable in Ambon State Polytechnic students, the following conclusions can be drawn:

1) Language literacy has a positive and significant impact on Artificial Intelligence.These results indicate that the better students' language literacy skills, the better their ability to utilize Artificial Intelligence to support academic activities, such as information search, idea development, and completion of college assignments.
2) Artificial Intelligence has a positive and significant effect on Academic Writing Ability.These findings show that the use of Artificial Intelligence can help students in composing academic writing through developing ideas, improving writing structure, using academic language, and editing manuscripts more effectively.
3) Language Literacy has a positive but not significant effect on Academic Writing Ability.These results indicate that students' language literacy skills are not yet able to directly improve their academic writing skills. Students' academic writing skills are influenced by other factors that support the writing process, one of which is the use of Artificial Intelligence.
4) Artificial Intelligence has been shown to mediate the relationship between Language Literacy and Academic Writing Ability.The test results show that the indirect effect of language literacy on academic writing skills through artificial intelligence is positive and significant. This finding suggests that students with good language literacy will be better able to utilize artificial intelligence effectively, which can ultimately improve their academic writing skills.
5) Based on the results of the mediation test, Artificial Intelligence acts as a full mediator (full mediation), because the direct influence of Language Literacy on Academic Writing Ability is not significant, while the indirect influence through Artificial Intelligence is significant.

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