

THE ROLE OF ARTIFICIAL INTELLIGENCE UTILIZATION ON STUDENTS' SELF-CONFIDENCE THROUGH KNOWLEDGE AND MOTIVATION

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Abstract

Advances in artificial intelligence (AI) have transformed the way students acquire information and supported the learning process. However, the impact of AI use on students' self-confidence through knowledge and motivation still requires further study. This study aims to analyze the effect of artificial intelligence on students' self-confidence, with knowledge and motivation serving as mediating variables. This study employed a quantitative approach involving 292 students from the Faculty of Economics and Business at Tadulako University, selected using the proportionate stratified random sampling technique. Data analysis was conducted using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) method with the SmartPLS 4 software. The results of the analysis indicate that artificial intelligence has a positive and significant effect on students' knowledge, motivation, and self-confidence. Knowledge does not have a significant effect on students' self-confidence. Motivation has a positive and significant effect on students' self-confidence. The results of the mediation test indicate that knowledge does not mediate the effect of artificial intelligence on students' self-confidence. The mediation test results also showed that motivation mediates the effect of artificial intelligence on students' self-confidence. These findings indicate that the use of artificial intelligence can support the improvement of students' self-confidence and provide insights for higher education institutions in optimizing the use of artificial intelligence in the learning process.

Keywords: Artificial Intelligence, Knowledge, Motivation, Self-Confidence

INTRODUCTION

The development of digital technology in recent years has brought significant changes to various aspects of life, including in higher education. One of the most rapidly developing and widely discussed technological innovations is artificial intelligence (AI). In the era of Industry 4.0 and the post-pandemic era, students no longer simply receive information in a one-way format, but actively explore, interact, and utilize digital tools to support the learning process. Hilal et al., (2024) stated that the development of artificial intelligence is capable of generating creative and innovative ideas to keep up with the times. Students are now increasingly familiar with the use of artificial intelligence as a learning support tool, ranging from platforms such as ChatGPT, Gemini, Perplexity, and others to find answers, analyze data, solve complex problems, and assist with completing academic assignments (Maulana et al., 2024). The use of artificial intelligence is also understood to contribute to improving learning efficiency and student academic quality. (Babu & Wening, 2025).

The phenomenon of the use of artificial intelligence in student academic activities is evident from the results of initial interviews conducted with several students. The interview results indicate that artificial intelligence has become an alternative learning resource that helps students understand lecture material and complete various academic assignments. One informant stated that artificial intelligence is often used to search for references and obtain additional explanations regarding material that is considered difficult. As expressed by Informant 1 (initials RJ) that "artificial intelligence helps me find explanations that are easier to understand when the lecture material feels difficult." In addition, artificial intelligence is also used by students as an aid in finding ideas and developing academic assignment frameworks. Informant 2 (initials DA) stated that "the use of artificial intelligence can help provide an initial overview in completing lecture assignments, especially when students have difficulty in determining the direction of the discussion." This shows that artificial intelligence technology functions not only as an information provider, but also as a supporting tool in students' academic thinking processes. On the other hand, the interview results also show that the use of artificial intelligence can help students analyze academic problems more systematically. Informant 3 (initials SN) stated that "artificial intelligence helps provide examples and problem-

solving steps, making it easier to understand the lecture material." This initial finding indicates that artificial intelligence has become part of students' learning strategies in the digital era. However, some students also recognize that the use of artificial intelligence requires a critical approach to verifying the accuracy of the information provided by the system. This demonstrates that the use of artificial intelligence is not only related to the ease of obtaining information, but also related to students' ability to manage knowledge and develop independent understanding. In learning practices in higher education, students are still found who routinely use artificial intelligence to complete assignments, but feel doubtful about their own academic abilities when faced with independent thinking without the aid of technology. This dependence on artificial intelligence has the potential to create a situation where students become accustomed to obtaining answers quickly, but lack confidence in their ability to understand the material and make academic decisions independently. This is in line with the view (Pakpahan, 2021), who stated that although artificial intelligence can meet the needs of the digital era, on the other hand, this technology also poses a threat to human resources because many jobs traditionally performed by humans are slowly being replaced by various advances in artificial intelligence.

Although artificial intelligence provides vast access to information, not all students are able to optimally utilize it to deepen their knowledge or increase their motivation to learn. This situation has the potential to hinder the optimal development of students' academic self-confidence. Self-confidence is an emotional component that plays a crucial role in facilitating learning development. (Ghafar, 2023). Self-confidence is related to an individual's belief in their abilities to face various academic challenges. Students with high levels of self-confidence tend to be more active in the learning process, boldly express their opinions, and have better abilities in solving academic problems. Conversely, low self-confidence can hinder the development of students' academic potential and reduce their participation in learning activities. In this regard, artificial intelligence has the potential to support the strengthening of student self-confidence when utilized appropriately. Artificial intelligence can help students acquire knowledge more quickly, provide academic feedback, and facilitate independent learning, potentially increasing a sense of competence and self-confidence. However, the use of artificial intelligence without being accompanied by strengthening knowledge and learning motivation can actually hinder the development of students' academic self-confidence.

In this study, knowledge and motivation were chosen as mediating variables because both play a crucial role in encouraging students to utilize technology, particularly artificial intelligence, optimally in their learning process. The use of artificial intelligence not only provides easy access to information but also has the potential to enrich knowledge and increase students' motivation to learn. Knowledge gained through the use of artificial intelligence can help accelerate the learning process, broaden academic horizons, and improve students' competence in understanding various lecture concepts. The development of artificial intelligence not only revolutionizes learning methods but also requires students to have adequate knowledge and motivation to adapt to increasingly complex global challenges. Knowledge itself is a collection of information possessed by an individual in a particular field. (Astuti et al., 2021). Through the use of artificial intelligence, students can gain access to a wider range of information sources, thereby deepening their understanding of course material. This technology can also assist students in analyzing academic problems, finding alternative solutions, and strengthening their independent learning process. Thus, the use of artificial intelligence has the potential to improve students' knowledge and academic competence through easier access to various sources of information. However, this increased knowledge does not necessarily directly increase students' self-confidence, as self-confidence is influenced not only by knowledge but also by various other factors related to learning experiences and the individual's belief in their abilities.

In addition to knowledge, learning motivation also plays a crucial role in determining the success of students' learning processes. Learning motivation reflects both internal and external drives that encourage students to strive to understand the material, overcome learning difficulties, and achieve desired academic goals. The presence of artificial intelligence in learning can stimulate student interest and curiosity. The interactive features, rapid response times, and personalized learning capabilities of artificial intelligence technology have the potential to encourage students to be more active in exploring learning materials. When individuals are motivated, they tend to make choices that lead to positive actions because they can clearly articulate their goals or desires (Djaman et al., 2021). However, the convenience offered by this technology also has the potential to decrease learning motivation if students become overly reliant on instant answers provided by the system. Thus, motivation functions as a psychological mechanism that can strengthen or weaken the impact of AI utilization on building self-confidence. When increased knowledge gained through artificial intelligence is supported by strong learning motivation, students will experience a marked increase in competence. This sense of competence ultimately shapes self-confidence in facing academic challenges. Therefore, the integration of knowledge and motivation is key in explaining how the use of artificial intelligence can contribute positively to strengthening student self-confidence in the digital learning era. Although the use of artificial intelligence in education has been extensively researched, most studies still focus on academic aspects such as

learning outcomes, learning effectiveness, critical thinking skills, and student motivation. Meanwhile, studies specifically examining the impact of artificial intelligence on students' psychological aspects, particularly self-confidence, are still relatively limited. Yet, self-confidence is a crucial factor influencing student success in facing various academic and professional challenges. Therefore, research is needed that can explain how the use of artificial intelligence can contribute to building student self-confidence.

Several previous studies related to the use of artificial intelligence in learning have shown varying results, such as the research conducted by (Andani & Friyatmi, 2025). found that the use of artificial intelligence had a positive and significant effect on students' critical thinking skills. However, this result contradicts the findings of Amdanata et al., (2023) who found that technological readiness had no effect on knowledge of artificial intelligence technology. On the other hand (Babu & Wening, 2025) stated that the use of artificial intelligence directly increases students' learning motivation . Meanwhile, research (Puspita & Isnalita, 2019) shows that Knowledge influences student self-confidence. (Khansa et al., 2025) emphasized that increasing knowledge can strengthen students' self-confidence. Another study, Fitriansyah et al., (2025) , and (Asiyah et al., 2019) also found that self-confidence has a positive effect on learning motivation. Furthermore, Yassir & Saharuna (2024) found that Artificial intelligence has a significant influence on learning outcomes mediated by motivation.

Based on the above description, there are still research gaps that require further study. Research on artificial intelligence in higher education has so far focused more on academic aspects, such as learning outcomes, learning effectiveness, critical thinking skills, and learning motivation, while its impact on students' psychological aspects, particularly self-confidence, remains relatively limited. Furthermore, previous research generally examines the direct relationship between artificial intelligence and knowledge, motivation, or learning outcomes, so the mechanisms explaining how artificial intelligence shapes student self-confidence are not yet comprehensively understood. Furthermore, research examining knowledge and motivation simultaneously as mediating variables in the relationship between artificial intelligence and student self-confidence is also limited. Therefore, this study was conducted to analyze the role of knowledge and motivation as mechanisms explaining the relationship between the use of artificial intelligence and student self-confidence.

LITERATURE REVIEW

Artificial intelligence

In the educational context, artificial intelligence is applied through platforms such as ChatGPT, Gemini, Perplexity, and other automated evaluation systems. (Yanti et al., 2024) . Artificial intelligence can provide various contributions, ranging from improvements in the learning process to personalizing the learning experience. (Rifky, 2024) . According to Saraswati et al., (2023) , Chat GPT is an artificial intelligence system capable of providing automatic responses based on input text, ranging from information search, writing, language translation, data analysis, to providing interactive simulations that approximate real-life experiences. AI not only increases efficiency and productivity, but also opens up space for innovation and solutions to complex problems. (Ulimaz et al., 2025) . AI's ability to provide rapid feedback contributes to accelerating the learning process and improving student understanding. (Nasution et al., 2025) . However, several studies also highlight its negative impacts, such as reduced learning independence, the risk of plagiarism, and decreased interest in reading due to excessive reliance on AI. (Kamil et al., 2025 ; Aulia et al., 2024) . According to Huang & Rust (2018) , artificial intelligence indicators are divided into 4, namely mechanical intelligence , analytical intelligence , intuitive intelligence, empathetic intelligence.

Knowledge

Knowledge is the result of human curiosity which is realized through various actions and efforts to understand and recognize objects of concern (Nurdin et al., 2020) . Individuals who lack knowledge, or even have only limited knowledge, can hinder the success of an institution, organization, or agency (Setyorini et al., 2021) . According to Gold Malhotra Segars, 2001 In Risnawati et al., (2024) , knowledge indicators are divided into 4, namely knowledge acquisition, knowledge conversion , knowledge application , and knowledge protection.

Motivation

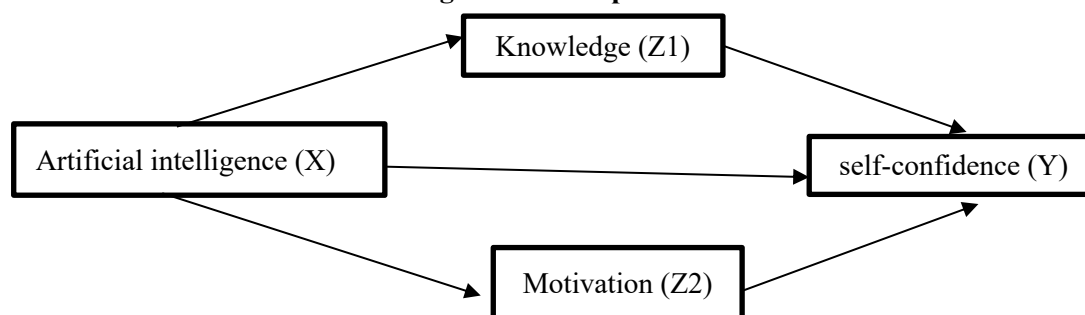
Motivation comes from the word motive , which means driving force. (Putra et al., 2018) . Motivation is also defined as the mental drive for individuals or group members in facing a task. (Madurika et al., 2021) . According to Gery (2024) , motivation is an effort that can motivate a person or group to do something because they want to achieve a desired goal and feel satisfied with what they have done. When individuals are motivated, they tend to make choices that lead to positive actions because they can clearly articulate their goals or desires. (Djaman et al., 2021) . Without sufficient motivation, students often struggle to achieve their academic potential (Hapsari et al.,

2024) . Thus, motivation is a condition that drives a person to act consciously and has a driving force within them (Paais, 2017) . According to Hartanti (2022) , indicators of motivation include interest in learning , perseverance and tenacity in learning, and academic goals.

Confidence

Self-confidence is a positive attitude that individuals have when assessing themselves, their environment, conditions, and the situations they face (Alawiyah et al., 2022) . Self-confidence is also seen as an individual's attitude where they are confident in their abilities, optimistic, and able to handle situations well (Septianti et al., 2023) . Furthermore, self-confidence reflects an individual's belief in their own abilities, enabling them to act independently, optimistically, and not easily influenced by the judgments of others. Self-confidence is also an important aspect that supports individuals in developing their potential, creativity, and various activities that lead to achievement. (Alamsyah & Hakim, 2021) . The self-confidence indicators in this study consist of three main aspects, namely believing in one's own abilities, acting independently in decision-making, and daring to express opinions.

Figure 1. Conceptual framework



Hypothesis:

H1: Artificial intelligence has a positive and significant effect on knowledge

H2: Artificial intelligence has a positive and significant effect on learning motivation.

H3: Knowledge has a positive and significant effect on student self-confidence.

H4: Learning motivation has a positive and significant effect on student self-confidence.

H5: Artificial intelligence has a positive and significant effect on student self-confidence.

H6: Knowledge mediates the influence of Artificial Intelligence on student self-confidence

H7: Motivation mediates the influence of Artificial Intelligence on students' self-confidence

METHOD

According to Sugiyono (2023) , a quantitative approach is used because the data obtained is in numerical form and analyzed using statistical techniques. This study adopted a quantitative method with a causal approach to analyze the cause-and-effect relationships between variables. This causal approach was chosen because it aimed to examine the direct and indirect influences between the variables involved (Pega et al., 2023) . This study is causally associative, so each variable is evaluated through a cause-and-effect relationship to obtain empirical findings that can describe the psychological and cognitive mechanisms formed through the use of artificial intelligence technology.

The population in this study consisted of all students in the Faculty of Economics and Business at Tadulako University from the 2022 and 2023 cohorts, totaling 1,081 students, comprising 463 students in the Management program, 194 students in the Development Economics program, and 424 students in the Accounting program. These cohorts were selected because their levels of exposure to technology, academic maturity, and adoption of artificial intelligence are relatively uniform. The sample size was determined using the Slovin formula with a 5% margin of error, resulting in a sample of 292 respondents. The sampling technique employed was proportionate stratified random sampling, in which the sample was divided proportionally according to the number of students in each program.

Primary data were collected using a 1–5 Likert-scale questionnaire via a Google Form link distributed to students through social media platforms such as WhatsApp groups. The instrument was designed based on four latent variables: the use of artificial intelligence as the independent variable, knowledge and motivation as mediating variables, and self-confidence as the dependent variable. Data analysis was performed using Partial Least Squares-based Structural Equation Modeling (PLS-SEM) with SmartPLS4 software. This method was chosen because it is capable of testing complex structural models involving mediating variables, does not require a normal data distribution, and is suitable for medium-sized samples (Hair et al., 2021).

RESULTS AND DISCUSSION

Table 2. Descriptive Statistics Output

Variables	N	Mean	Median	Observed Min	Bserved Max	Standard Deviation
AI1	292	4,236	4,000	2,000	5,000	0.664
AI2	292	4,048	4,000	1,000	5,000	0.743
AI3	292	4,209	4,000	2,000	5,000	0.598
AI4	292	4,065	4,000	1,000	5,000	0.726
AI5	292	4,086	4,000	1,000	5,000	0.695
AI6	292	3,983	4,000	1,000	5,000	0.752
AI7	292	4,099	4,000	2,000	5,000	0.678
AI 8	292	4,185	4,000	2,000	5,000	0.619
K1	292	4,192	4,000	2,000	5,000	0.565
K2	292	3,353	3,000	1,000	5,000	1,067
K3	292	4,092	4,000	2,000	5,000	0.557
K4	292	4,243	4,000	1,000	5,000	0.579
K5	292	4,003	4,000	1,000	5,000	0.649
K6	292	3,894	4,000	1,000	5,000	0.771
K7	292	4,356	4,000	2,000	5,000	0.665
K8	292	4,408	4,000	2,000	5,000	0.592
M1	292	3,531	4,000	1,000	5,000	1,025
M2	292	3,377	4,000	1,000	5,000	1,051
M3	292	3,702	4,000	1,000	5,000	0.931
M4	292	3,808	4,000	1,000	5,000	0.805
M5	292	3,860	4,000	1,000	5,000	0.886
M6	292	3,329	4,000	1,000	5,000	1,061
SC1	292	3,945	4,000	1,000	5,000	0.660
SC2	292	4,092	4,000	1,000	5,000	0.626
SC3	292	3,901	4,000	1,000	5,000	0.860
SC4	292	3,945	4,000	2,000	5,000	0.617
SC5	292	4,062	4,000	2,000	5,000	0.622
SC6	292	4,068	4,000	2,000	5,000	0.787

Descriptive statistics is a statistical method used to analyze data by presenting, explaining, and describing the collected data according to actual conditions, without the aim of drawing conclusions that can be generalized to a wider population (Sugiyono, 2023).

Based on Table 2, the number of respondents (N) for all statement items was 292. The mean value for all indicators ranged from 3.353 to 4.408, indicating that the average respondent tended to agree with the statements. The median value for all items was 4.000, indicating that the majority of respondents agreed.

For the Artificial Intelligence (AI) variable, the highest mean score was found in indicator AI1 at 4.236, while the lowest score was found in indicator AI6 at 3.983. This indicates that respondents have a fairly positive perception of the use of artificial intelligence.

For the Knowledge (K) variable, the highest mean value was found in indicator K8 at 4.408, while the lowest value was found in indicator K2 at 3.353. These results indicate that respondents tended to give a positive assessment of the knowledge aspects measured in the study.

For the Motivation (M) variable, the highest mean value was found in indicator M5 at 3.860, while the lowest value was found in indicator M6 at 3.329. These results indicate that respondents tended to respond positively to the motivational aspects measured in the study.

Furthermore, for the Self-Confidence (SC) variable, the highest mean value was found in indicator SC6 at 4.068, while the lowest value was found in indicator SC3 at 3.901. These results indicate that respondents tended to give positive assessments of the self-confidence aspects measured in the study.

minimum observed value in the table ranges from 1,000 to 2,000, while the maximum observed value for all indicators is 5,000. This indicates that all response scales in the questionnaire were used by respondents.

Furthermore, the standard deviation for all indicators is relatively small, ranging from 0.557 to 1.061. This indicates that the distribution of respondent data is quite good, and that respondents' answers tend to be homogeneous or not too varied. Based on the results of the descriptive statistics, it can be concluded that in general respondents gave positive responses to all variables in this study.

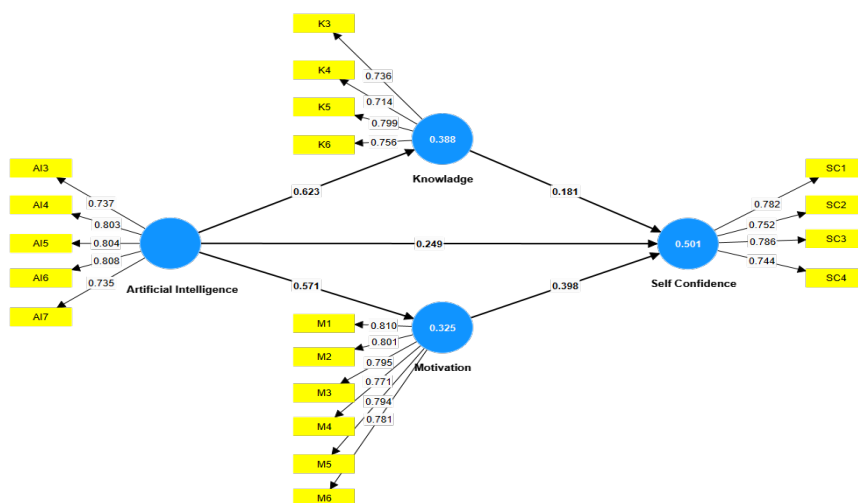


Figure 1. PLS-SEM algorithm results

Based on the Picture 1 PLS-SEM Algorithm results, it is known that the Artificial Intelligence variable has a positive influence on Knowledge, Motivation, and Self-Confidence with path coefficient values of 0.623; 0.571; and 0.249, respectively. The greatest influence is shown in the relationship between Artificial Intelligence and Knowledge, which means that the higher the application of Artificial Intelligence, the respondent's knowledge will also increase. Furthermore, Knowledge has a positive influence on Self-Confidence with a coefficient value of 0.181, but this influence is relatively weak compared to other relationships. Meanwhile, Motivation has a stronger positive influence on Self-Confidence with a coefficient value of 0.398, so that Motivation becomes a more dominant factor in increasing Self-Confidence. The R-square value on the Knowledge construct of 0.388 indicates that the variable can be explained by Artificial Intelligence by 38.8%, while Motivation is 32.5% and Self-Confidence by 50.1%. In addition, all indicators in each variable have an outer loading value above 0.70, so it can be stated that the indicators used have met the validity criteria and are able to represent the research construct well.

Evaluation Results of the Measurement Model (Outer Model)

Convergent Validity Test

Convergent validity testing is used to determine the extent to which an indicator is able to explain the construct being measured. In the PLS-SEM method, convergent validity is evaluated through the outer loading and Average Variance Extracted (AVE) values. An indicator is declared valid if its outer loading value is ≥ 0.70 , while a construct meets convergent validity if its AVE value is ≥ 0.50 . (Hair et. al., 2021) In the initial stages of the measurement model evaluation, several indicators showed outer loading values below the recommended minimum limit of 0.70. Therefore, these indicators were gradually eliminated to improve construct validity and reliability. After the elimination process, all remaining indicators had outer loading values above 0.70, thus meeting convergent validity criteria and suitable for use in further analysis.

Table 3. Outer Loading & AVE value

Variables	Statement	Outer loading	Information	AVE value	Information
Artificial intelligence	AI3	0.737	Valid	0.605	Valid
	AI4	0.803	Valid		Valid
	AI5	0.804	Valid		Valid
	AI6	0.808	Valid		Valid
	AI7	0.735	Valid		Valid

Knowledge	K3	0.736	Valid	0.565	Valid
	K4	0.714	Valid		Valid
	K5	0.799	Valid		Valid
	K6	0.756	Valid		Valid
Motivation	M1	0.810	Valid	0.627	Valid
	M2	0.801	Valid		Valid
	M3	0.795	Valid		Valid
	M4	0.771	Valid		Valid
	M5	0.794	Valid		Valid
	M6	0.781	Valid		Valid
Self-Confidence	SC1	0.782	Valid	0.587	Valid
	SC2	0.752	Valid		Valid
	SC3	0.786	Valid		Valid
	SC4	0.744	Valid		Valid

Based on Table 3, the results of the convergent validity test show that all indicators in the research variables have outer loading values above 0.70. In the Artificial Intelligence variable, the outer loading value ranges from 0.735–0.808 with an AVE value of 0.605. The Knowledge variable has an outer loading value between 0.714–0.799 with an AVE value of 0.565. Furthermore, the Motivation variable shows an outer loading value of 0.771–0.810 with an AVE value of 0.627. In the Self-Confidence variable, the outer loading value is in the range of 0.744–0.786 with an AVE value of 0.587. These results indicate that all indicators in each variable have met the convergent validity criteria, as the outer loading value is >0.70 and the AVE value is >0.50 . Therefore, it can be concluded that all statement items in this study are valid and able to measure the research constructs well.

Discriminant Validity Test

Discriminant validity testing aims to ensure that a construct has a clear difference from other constructs. Testing is conducted using the Fornell-Larcker method and the Heterotrait-Monotrait Ratio (HTMT). Discriminant validity is met if the square root of the AVE is greater than the correlation between constructs and the HTMT value is <0.90 . (Hair et. al., 2021) .

Table 4. Fornell-larcker

Variables	Artificial intelligence	Knowledge	Motivation	Self-Confidence
Artificial intelligence	0.778			
Knowledge	0.623	0.752		
Motivation	0.571	0.546	0.792	
Self-Confidence	0.589	0.553	0.639	0.766

Based on Table 4, the square root of the AVE value for each variable is greater than the correlation value between the other variables. The Artificial Intelligence variable has a value of 0.778, Knowledge 0.752, Motivation 0.792, and Self-Confidence 0.766. These results indicate that each variable is able to differentiate itself from the other variables, thus meeting discriminant validity.

Table 5. Heterotrait Monotrait Ratio (HTMT)

Variables	Artificial intelligence	Knowledge	Motivation	Self-Confidence
Artificial intelligence				
Knowledge	0.787			
Motivation	0.661	0.668		
Self-Confidence	0.728	0.723	0.766	

Based on Table 5, all correlation values between variables are below 0.90, ranging from 0.661 to 0.787. This value indicates that there are no discriminant validity issues in the research model. Thus, all variables in the study are valid and capable of measuring different constructs effectively.

Reliability Test

Reliability testing was used to determine the level of consistency of respondents' answers to the indicators in each research variable. Reliability testing in this study was assessed using Cronbach's Alpha , Composite Reliability (rho_a) , and Composite Reliability (rho_c) . A variable is considered reliable if it has a value > 0.70. (Hair et al., 2021) .

Table 6. Reliability Test

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Artificial intelligence	0.836	0.836	0.884
Knowledge	0.743	0.746	0.839
Motivation	0.881	0.883	0.910
Self-Confidence	0.767	0.770	0.851

Based on Table 6, all variables have Cronbach's Alpha , Composite Reliability (rho_a) , and Composite Reliability (rho_c) values above 0.70. The Artificial Intelligence variable has a Cronbach's Alpha value of 0.836, rho_a of 0.836, and rho_c of 0.884. The Knowledge variable has values of 0.743, 0.746, and 0.839. The Motivation variable has values of 0.881, 0.883, and 0.910. Meanwhile, the Self-Confidence variable has values of 0.767, 0.770, and 0.851. These results indicate that all variables in the study have a good level of consistency so that all indicators are declared reliable and suitable for use in research.

Structural Model Evaluation Results (Inner Model)

Table 7. R-Square

	R-square	R-square adjusted
Knowledge	0.388	0.386
Motivation	0.325	0.323
Self-Confidence	0.501	0.495

Based on the R-Square Table, it is known that the Knowledge variable has an R-square value of 0.388 and an adjusted R-square of 0.386, which means that the Knowledge variable can be explained by other variables in the model by 38.8%, while the remaining 61.2% is explained by other factors outside the study. The Motivation variable has an R-square value of 0.325 and an adjusted R-square of 0.323, so it can be interpreted that Motivation can be explained by variables in the model by 32.5%, while 67.5% is influenced by other factors not studied. Furthermore, the Self-Confidence variable obtained an R-square value of 0.501 and an adjusted R-square of 0.495, which indicates that Self-Confidence can be explained by variables in the model by 50.1%, while the remaining 49.9% is influenced by other variables outside the research model. Overall, these results indicate that the research model has moderate explanatory power.

Table 8. F-square

	Artificial intelligence	Knowledge	Motivation	Self-Confidence
Artificial intelligence		0.634	0.483	0.067
Knowledge				0.036
Motivation				0.195
Self-Confidence				

Based on Table 8, it is known that the Artificial Intelligence variable has a large influence on Knowledge with an F-square value of 0.634 and on Motivation of 0.483, while its influence on Self-Confidence is relatively small with a value of 0.067. Furthermore, the Knowledge variable has a small influence on Self-Confidence with an F-square value of 0.036. Meanwhile, the Motivation variable has a moderate influence on Self-Confidence with an F-square value of 0.195. Thus, it can be concluded that the largest influence in this research model is the influence of Artificial Intelligence on Knowledge, while the smallest influence is Knowledge on Self-Confidence .

Hypothesis Testing

Hypothesis testing was performed using the bootstrapping procedure. by looking at the path coefficient, t-statistics, and p-values. The hypothesis is declared accepted if it has a t-statistics value > 1.96 . And p-values < 0.05 at a significance level of 5% (Hair et. al., 2021) .

Table 9. Direct Effect

Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Artificial intelligence -> Knowledge	0.623	0.625	0.048	12,904	0.000
Artificial intelligence -> Motivation	0.571	0.573	0.06	9,532	0.000
Knowledge -> Self-Confidence	0.181	0.185	0.1	1,805	0.071
Motivation -> Self-Confidence	0.398	0.396	0.061	6,483	0.000
Artificial intelligence -> Self-Confidence	0.249	0.25	0.082	3,053	0.002

Based on Table 9, it is known that the relationship between Artificial Intelligence on Knowledge has a positive and significant influence with the original sample value of 0.623, T-statistics 12.904, and P-values 0.000. Artificial Intelligence also has a positive and significant influence on Motivation with the original sample value of 0.571, T-statistics 9.532, and P-values 0.000. Furthermore, Artificial Intelligence on Self-Confidence shows a positive and significant influence with the original sample value of 0.249, T-statistics 3.053, and P-values 0.002. Motivation on Self-Confidence also has a positive and significant influence with the original sample value of 0.398, T-statistics 6.483, and P-values 0.000. However, the relationship between Knowledge and Self-Confidence does not have a significant effect because it has a P-value of 0.071 which is greater than 0.05, although the original sample value shows a positive relationship direction of 0.181. Thus, most of the hypotheses in this study were accepted, except for the influence of Knowledge on Self-Confidence which was rejected because it was not significant.

Table 10. Indirect Effect

Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Artificial intelligence -> Knowledge -> Self-Confidence	0.113	0.115	0.062	1,820	0.069
Artificial intelligence -> Motivation -> Self-Confidence	0.227	0.226	0.04	5,683	0.000

Based on Table 10, it is known that the indirect influence of Artificial Intelligence The original sample value of 0.113, a T-statistic of 1.820, and a P-value of 0.069 (> 0.05) on Self-Confidence through Knowledge indicate that Knowledge is unable to mediate the influence of Artificial Intelligence. on Self-Confidence significantly, so the mediation hypothesis through Knowledge is rejected. Meanwhile, the indirect effect of Artificial Intelligence on

Self-Confidence through Motivation has an original sample value of 0.227, a T-statistic value of 5.683, and a P-value of 0.000 (<0.05). This indicates that Motivation is able to mediate the effect of Artificial Intelligence on Self-Confidence positively and significantly, so the mediation hypothesis through Motivation is accepted. Thus, it can be concluded that Motivation has an important role as a mediating variable in increasing Self-Confidence, while Knowledge has not been able to be a significant mediator in this relationship.

DISCUSSION

The Influence of Artificial Intelligence towards Knowledge

The results of the study indicate that Artificial Intelligence has a positive and significant impact on student knowledge. This finding suggests that the greater the use of Artificial Intelligence in the learning process, the higher the level of student knowledge. The presence of AI-based technologies such as ChatGPT, Gemini, and Perplexity makes it easier for students to obtain information, understand lecture material, and find solutions to academic problems quickly and efficiently. This study supports the view that artificial intelligence can expand access to knowledge and accelerate the student learning process. Artificial Intelligence serves not only as a source of information but also as a tool capable of providing additional explanations, problem-solving examples, and even more personalized learning recommendations. This convenience allows students to improve their understanding of course material more independently.

of this study are also in line with the research of Ratnasari et.al., (2025) which found that Artificial Intelligence have a significant role in Develop critical thinking skills. Artificial Intelligence also helps students navigate databases and find academic information more effectively and efficiently, thus supporting a more optimal learning process. (Wati, 2024) . Thus, the use of Artificial Intelligence can be an effective supporting tool in improving student knowledge in the digital era. However, increasing knowledge through Artificial Intelligence still requires critical thinking skills in filtering the information obtained. Because Artificial Intelligence not only increase efficiency and ability to access information, but also can reduce creativity and critical thinking skills (Ibad, 2024) . Therefore, students need to understand that not all information generated by Artificial Intelligence can be accepted directly without verification. Evaluative skills and digital literacy are still necessary for technology use to provide optimal benefits for student knowledge development.

The Influence of Artificial Intelligence towards Motivation

The research results show that Artificial Intelligence has a positive and significant effect on student motivation . This finding suggests that the use of Artificial Intelligence can increase students' learning motivation in the academic process. Artificial Intelligence provides a more interactive, fast, and flexible learning experience, thereby increasing student interest in exploring learning materials. Students find it more helpful when they encounter difficulties understanding the material because AI can provide instant and easy-to-understand explanations. This convenience creates a sense of comfort in learning and encourages students to be more active in seeking information and completing academic assignments. The presence of Artificial Intelligence is able to create a more adaptive learning environment so that students become more interested in learning independently.

The findings of this study are also in line with research Tasya et al., (2025) stated that the use of Artificial Intelligence has a positive and significant influence on learning motivation. In addition, this research (Purba et al., 2025) also found that the use of Artificial Intelligence in learning significantly increases student learning motivation. By providing easy access, engaging interactions, quality content, personalization, and appropriate feedback, Artificial Intelligence can be an effective tool in increasing learning interest. (Juanta et al., 2024) . Thus, the better the utilization of Artificial Intelligence , the higher the students' learning motivation. However, excessive use of Artificial Intelligence can also lead to dependence on instant answers. This situation has the potential to diminish students' enthusiasm for learning if they rely solely on technology without engaging in independent learning processes. Therefore, the use of Artificial Intelligence should be directed as a learning aid, not a substitute for students' thinking processes.

The Effect of Knowledge on Self-Confidence

The research results showed that knowledge had no effect on students' self-confidence. This finding suggests that increased knowledge does not necessarily directly increase students' self-confidence. Even if students have good knowledge, it is not enough to build strong beliefs in their abilities. The results of this study are in line with research Azizah et al., (2022) found that knowledge had no significant effect on self-confidence . This finding suggests that possessing a high level of knowledge does not always translate into increased self-confidence. In other words, a person's knowledge may not necessarily build confidence in their abilities if it is not accompanied by experience, skills, or the courage to apply that knowledge in real-world situations.

These findings also indicate that possessing knowledge alone is not enough to build student self-confidence. Self-confidence is not only formed by the knowledge an individual possesses, but is also influenced by experience, success, the ability to apply knowledge, and self-evaluation of one's abilities. Students can have a high level of knowledge through the use of Artificial Intelligence, but if this knowledge has not been directly applied in academic activities, then an increase in self-confidence will not necessarily occur. This condition indicates that learning experiences and active student involvement may have a more important role than knowledge alone in building self-confidence. In addition, some students tend to utilize Artificial Intelligence It's often viewed as a tool for quickly finding solutions rather than as a means to deepen understanding. This can lead students to focus more on the end result than on the actual learning process. Therefore, the knowledge gained through Artificial Intelligence needs to be balanced with active learning experiences, critical thinking skills, and direct involvement in the academic process to make a greater contribution to building student self-confidence.

The Influence of Motivation on Self-Confidence

The results of the study showed that motivation had a positive and significant effect on student self-confidence . This indicates that the higher a student's learning motivation, the higher their level of self-confidence. Students with high learning motivation tend to be more active in the learning process, confident in facing academic challenges, and possess greater confidence in their abilities. Motivation drives students to continue learning, strive to understand the material, and achieve their desired academic goals. When students achieve their learning goals, their self-confidence also increases.

The results of this study are in line with research Banafsaj & Affandi (2023) stated that Motivation has a positive and significant impact on self-confidence . Motivated students tend to have a positive view of their abilities, making them more confident in completing assignments and participating in academic activities. In addition, motivation also plays a role as a psychological factor that strengthens the impact of use. Artificial Intelligence on Self-Confidence. Highly motivated students will utilize Artificial Intelligence as a learning tool to improve their competencies, rather than simply seeking instant answers. Therefore, motivation is a crucial factor in building student self-confidence in the digital learning era.

The Influence of Artificial Intelligence on Self-Confidence

The results of the study indicate that Artificial Intelligence has a positive and significant effect on student self-confidence . This indicates that the use of Artificial Intelligence can increase student self-confidence in facing academic activities. The use of Artificial Intelligence helps students gain a better understanding of course material, making them feel more prepared to complete assignments, engage in discussions, and express their opinions. When students receive academic support that facilitates their learning, their sense of competence also increases. This sense of competence is one factor that contributes to student self-confidence.

This research is in line with research Junaedi (2026) , who found that the benefits of Artificial Intelligence has a positive and significant impact on student self-confidence. This means that Artificial Intelligence can help students solve academic challenges more effectively, thereby increasing their confidence in their own abilities. Furthermore, these findings demonstrate that Artificial Intelligence not only impacts students cognitively but also psychologically. Students who are able to effectively utilize technology tend to feel more confident because they have access to extensive and easy-to-use learning resources. However, increasing self-confidence through Artificial Intelligence must be balanced with students' independent abilities. Excessive reliance on technology can lead to students feeling less confident when having to complete assignments without the help of Artificial Intelligence . Therefore, the use of Artificial Intelligence needs to be balanced with the development of critical thinking skills and independent learning.

The Role of Knowledge Mediation

The results of the study indicate that knowledge is unable to mediate the effect of artificial intelligence on student self-confidence. This finding suggests that increased use of artificial intelligence by students does not automatically increase self-confidence through increased knowledge. Although Artificial Intelligence can help students acquire information and knowledge more quickly, this knowledge does not necessarily translate into confidence in one's own abilities. Knowledge relates to an individual's understanding of an object or phenomenon, while self-confidence is influenced not only by knowledge but also by an individual's confidence in utilizing that knowledge when facing various academic tasks and challenges. In the context of using Artificial Intelligence, students can obtain answers, solutions, or information instantly through various AI - based platforms. This condition allows students to understand the material better, but does not necessarily make them confident that they can produce the same solution independently without the help of technology. Thus, increased knowledge gained through Artificial

Intelligence is not necessarily followed by increased self-confidence. This finding shows that knowledge gained through Artificial Intelligence is still at the level of understanding, not yet fully developed into confidence in one's own ability to apply this knowledge to real situations.

Furthermore, the insignificant mediation role of knowledge also suggests that other factors may play a greater role in shaping student self-confidence. The results of this study also indicate that motivation significantly mediates the effect of Artificial Intelligence on self-confidence, while knowledge does not. These findings suggest that the influence of Artificial Intelligence on student self-confidence occurs more through increased learning motivation than through increased knowledge alone. Therefore, knowledge has not been able to effectively mediate the relationship between Artificial Intelligence and student self-confidence. Increasing student self-confidence depends not only on the amount of knowledge they possess, but also on their ability to apply that knowledge, their involvement in the learning process, and their belief in their own competence.

The Role of Motivation Mediating

The results of the study indicate that motivation can positively and significantly mediate the effect of Artificial Intelligence on self-confidence. These results indicate that the use of Artificial Intelligence can improve student self-confidence by increasing learning motivation. Artificial Intelligence facilitates the learning process, making students feel more interested and motivated to learn. When learning motivation increases, students become more active in exploring material, completing assignments, and facing academic challenges. This condition encourages self-confidence because students feel more capable of achieving their academic goals.

These findings support the research of Yassir & Saharuna (2024), which states that Artificial Intelligence has a significant influence on learning outcomes mediated by learning motivation. In this study, motivation was proven to play a role as a mediating variable connecting Artificial Intelligence and student self-confidence. These results indicate that the success of utilizing Artificial Intelligence in increasing self-confidence depends not only on the technological aspect, but also on the psychological condition of the students. High motivation encourages students to utilize technology as a means of developing competencies, so that the learning experience obtained becomes more meaningful and can increase confidence in their abilities. Furthermore, the research results also show that the direct effect of Artificial Intelligence on self-confidence remains significant even when the motivation variable is included in the model. This condition indicates that motivation acts as a partial mediator. In other words, Artificial Intelligence can increase student self-confidence directly and indirectly through increased learning motivation. These findings also indicate that while Artificial Intelligence plays a significant role in increasing student knowledge through easier access to information and learning resources, this increase in knowledge does not necessarily translate into increased self-confidence. Conversely, motivation is more closely linked to students' psychological aspects and therefore better explains the development of self-confidence. Therefore, the effect of Artificial Intelligence on self-confidence in this study occurs more through increased motivation than through increased knowledge.

CONCLUSION

Based on the results of this study on the role of artificial intelligence in enhancing students' self-confidence through knowledge and motivation, it can be concluded that artificial intelligence has a positive and significant effect on students' knowledge, motivation, and self-confidence. This indicates that the use of artificial intelligence can help students acquire better knowledge, increase their motivation to learn, and strengthen their belief in their own abilities when facing academic activities. Furthermore, motivation has a positive and significant effect on self-confidence, meaning that the higher a student's learning motivation, the higher their level of self-confidence. Conversely, knowledge does not have a significant effect on self-confidence; thus, an increase in knowledge does not necessarily lead to an increase in confidence in one's abilities. The results of the mediation test indicate that knowledge does not mediate the effect of artificial intelligence on students' self-confidence. The mediation test results also show that motivation mediates the effect of artificial intelligence on students' self-confidence. The findings of this study indicate that the use of artificial intelligence can support the improvement of students' self-confidence and serve as an alternative tool to support the learning process in higher education.

Based on the research findings, students are expected to enhance their motivation to learn by utilizing artificial intelligence as a tool to encourage active engagement in the learning process, given that the motivation variable has a relatively lower average score compared to other variables. In addition, students need to use artificial intelligence critically by verifying information and deepening their understanding so that the knowledge gained can be applied to solve problems independently. Although students' self-confidence is relatively high, their ability to express opinions, engage in discussions, and complete tasks independently still needs to be improved so that their belief in their own abilities continues to grow. The use of artificial intelligence, which is already at a high level, also

needs to be guided wisely as a support for the learning process, not as a substitute for critical thinking. For faculty members and universities, the results of this study are expected to serve as input in designing learning experiences that encourage the ethical and responsible use of artificial intelligence, as well as enhance students' motivation, knowledge, and self-confidence. Future research is encouraged to include additional variables, such as digital literacy, critical thinking skills, experience with artificial intelligence, or self-efficacy, to gain a more comprehensive understanding of the factors influencing students' self-confidence.

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