JOURNAL ON MATHEMATICS EDUCATION RESEARCH (J-MER)
Universitas Pendidikan Indonesia | e-ISSN 3047-1095 | ejournal-science.upi.edu/jmer

RESEARCH ARTICLE | Vol. 7, No. 2 (2026) | pp. 274-284

The Influence of Self-Efficacy and Perceptions of Artificial Intelligence on High School Students' Mathematics Achievement

Aisya Widya Rahayu[1] · Devina Nabila[1] · Nasywa Putri Azzahra[1] · Syaira Nasywa Suhendar[1] · Bill Chairy Rizki Bustaren[1*] · Dadang Juandi[1]

[1] Mathematics Education Study Program, Universitas Pendidikan Indonesia, Bandung, Indonesia
* Corresponding author: billchairyrizki@upi.edu

ABSTRACT

Advances in Artificial Intelligence (AI) have transformed education, including how students learn mathematics. Students increasingly use AI to find information, complete assignments, and understand learning materials. Beyond technological factors, self-efficacy is a psychological factor believed to influence students' learning success. This study aims to determine how self-efficacy and students' perceptions of Artificial Intelligence (AI) influence high school students' mathematics learning outcomes. The study employs a quantitative, cross-sectional design. The research subjects are 86 eleventh-grade students at a high school in Bandung, selected through random sampling. Data were collected by distributing self-efficacy questionnaires, AI perception questionnaires, and documentation of students' mathematics learning outcomes. Data were analyzed using descriptive statistics and multiple linear regression analysis with SPSS. The results indicate that neither students' self-efficacy nor their perceptions of AI significantly affected mathematics learning outcomes, either partially or simultaneously. Furthermore, the two independent variables contributed relatively little to learning outcomes (3.9%), meaning that 96.1% of the influence on students' academic achievement is attributed to factors outside the scope of this study. Therefore, the use of AI in learning must be balanced with appropriate learning strategies and teacher guidance to optimally support students' conceptual understanding and critical thinking skills.

Keywords: Self-efficacy; Artificial Intelligence; Mathematics learning outcomes; Students' perceptions

ARTICLE INFORMATION	Received	Revised	Accepted	Published
	Jun 2, 2026 ·	Oct 31, 2026	Nov 2, 2026	Nov 6, 2026
DOI	https://doi.org/10.17509/j-mer.v7i2.941			

HOW TO CITE

Rahayu, A.W., Nabila, D., Azzahra, N.P., Suhendar, S.N., Bustaren, B.C.R., & Juandi, D. (2026). The Influence of Self-Efficacy and Perceptions of Artificial Intelligence on High School Students' Mathematics Achievement. *Journal on Mathematics Education Research*, *7*(2), 274–284. https://doi.org/10.17509/j-mer.v7i2.941

OPEN ACCESS & COPYRIGHT

© 2026 Rahayu et al. Distributed under CC BY-SA 4.0
Reuse requires attribution and ShareAlike; authors retain copyright.

INTRODUCTION

The changing global era demands that education actively contribute to developing high-caliber human resources. One factor influencing academic performance is the use of Artificial Intelligence (Riska & Rahmi, 2025). As Abdurrahman et al. (2025) state, Artificial Intelligence helps create innovative opportunities to improve efficiency, personalize learning, and enhance academic outcomes. Artificial Intelligence (AI) is a term associated with Industry 4.0 and Society 5.0, referring to "computer programs, machine learning, hardware, and software." The science behind this intelligence uses hardware and software solutions inspired by reverse-engineering neural patterns in the human brain. These Industry 4.0 products are widely used across industries, including education, for development and everyday applications (Zahara et al., 2023).

Currently, AI (Artificial Intelligence) technology is widely used to support the learning process, for example, in developing instructional materials, translating languages, and searching for information. Artificial Intelligence offers various benefits in education, such as helping students complete academic assignments, facilitating access to knowledge, and improving learning efficiency. In mathematics education, AI can help students understand material through step-by-step, systematic explanations. Krisdianto and Roesdiana (2025) found that students view AI as an effective tool for understanding mathematics, mainly because it can provide step-by-step, systematic explanations.

However, using artificial intelligence in mathematics education also presents challenges. Although it can help students find answers and understand solution steps, overreliance on artificial intelligence can diminish students' independent thinking, mathematical reasoning abilities, and critical thinking skills in solving mathematical problems (Sahabuddin et al., 2025). This is concerning because, in mathematics education, logical thinking and problem-solving are crucial aspects that must continue to be developed. Therefore, students' belief in their abilities, or self-efficacy, must also be considered when using AI in mathematics education.

According to Baduri & Nurrahmah (2024), self-efficacy is an individual's belief in their ability to control their own capabilities, which manifests through actions taken to meet life's demands. Therefore, strong self-efficacy is necessary to feel confident in one's abilities and to be certain that one can solve problems, no matter how difficult they may be, including test questions. Furthermore, Kurniawati & Liana (2022) and Baduri & Nurrahmah (2024) found that self-efficacy directly influences students' academic performance, quality of thinking, use of cognitive skills, and persistence in seeking solutions. Therefore, self-efficacy is essential to students' learning success because, with high self-efficacy, students can optimize their abilities.

Advances in artificial intelligence not only provide alternatives for obtaining information but also influence how students learn mathematics. Students can use artificial intelligence to get additional explanations, understand problem-solving steps, and explore alternative solutions. Nugroho et al. (2026) found that high school students have a positive perception of using artificial intelligence as a learning aid in mathematics, particularly to help them understand the material and solve problems. However, students are also aware of the risks of becoming dependent on AI, a reduction in independent learning efforts, and a decline in critical thinking skills if AI is used excessively. These findings indicate that students' perceptions of AI are important to examine because they may relate to how students use this technology in mathematics learning.

© 2026 Rahayu et al. · CC BY-SA 4.0

Wulanningtyas & Ate (2020) state that confidence in completing math tasks requires high self-efficacy to achieve the expected academic performance. This motivation influences one's effort to succeed and compete with a sense of excellence. This motivation may stem from others' achievements or from one's own past accomplishments. Self-efficacy is considered the strongest internal factor in achieving academic success. A person with high self-efficacy believes they can take action to influence events around them. In contrast, a person with low self-efficacy views themselves as fundamentally incapable of handling the challenges in their environment. In difficult situations, people with low self-efficacy tend to give up easily, whereas those with high self-efficacy will try harder to overcome the challenges they face (Cahyani & Winata, 2020).

Previous research has examined self-efficacy in relation to academic achievement (Lampert, 2007; Rahmawati et al., 2024). As the use of Artificial Intelligence in education continues to grow, research has also begun to examine the relationship between self-efficacy and AI use. Estrada-Araoz et al. (2025) found a significant negative relationship between academic self-efficacy and reliance on AI, whereas Acosta-Enriquez et al. (2025) reported a positive relationship between these two variables. Additionally, Riska & Rahmi (2025) examined the use of AI and self-efficacy in relation to learning performance.

Currently, artificial intelligence (AI) technology is gaining increasing attention in education, including mathematics education. Hwang and Tu (2021) reviewed the state of research on AI applications in mathematics education and found that AI has the potential to support the mathematics learning process. Additionally, Egara et al. (2025) found that high school students have diverse perceptions of using ChatGPT in mathematics learning. Students believe ChatGPT can help them understand the material and solve problems, but they also expressed several concerns about its limitations. These findings suggest that Artificial Intelligence can be utilized as a learning tool, but its use must still be accompanied by a critical mindset and consideration of the technology's limitations.

Theoretically, self-efficacy and students' perceptions of using Artificial Intelligence are two aspects that may relate to mathematics learning outcomes through different mechanisms. Self-efficacy relates to students' belief in their ability to complete tasks, which can influence their effort and persistence when facing difficulties. Meanwhile, perceptions of AI use relate to how students assess the benefits and limitations of this technology as a learning aid. These perceptions may influence how students select and utilize AI to support their understanding of the material. Street et al. (2024) discuss mathematical self-efficacy in relation to students' learning behaviors and performance, while Joshi et al. (2026) examine acceptance of AI in mathematics learning and its relationship to high school students' mathematics achievement. Therefore, these two variables are relevant to be tested together in relation to mathematics learning outcomes.

Previous research has examined self-efficacy in relation to academic achievement, while the use of Artificial Intelligence has been examined in terms of students' perceptions and its application in learning. However, the literature review shows that studies examining students' perceptions of Artificial Intelligence use and self-efficacy simultaneously in relation to mathematics learning outcomes are still needed. Therefore, this study was conducted to analyze the influence of students' perceptions of the use of Artificial Intelligence and self-efficacy, both partially and simultaneously, on students' mathematics learning outcomes at a high school in Bandung.

© 2026 Rahayu et al. · CC BY-SA 4.0

Preliminary observations at a high school in Bandung City showed that students' average self-efficacy score was 41.63, while their average score for perceptions regarding the use of Artificial Intelligence was 43.51. These data provide an initial picture of students' self-efficacy and perceptions regarding the use of AI in learning. These findings serve as a basis for further examining the relationship between these two variables and students' mathematics learning outcomes.

Based on this description, this study was conducted to examine students' perceptions of the use of Artificial Intelligence and their self-efficacy in relation to mathematics learning outcomes. This study aimed to analyze the influence of students' perceptions of Artificial Intelligence use and their self-efficacy, both separately and simultaneously, on students' mathematics learning outcomes at a high school in Bandung.

METHOD

Research Design and Setting

This study employed a quantitative research method with a cross-sectional design. The population consisted of 11th-grade students at a high school in Bandung, and the study was conducted in May 2026.

Participants, Instruments, and Procedures

The sample was selected using random sampling, with three 11th-grade classes chosen as the study sample, comprising 107 students. The research instruments were distributed online via a WhatsApp group using a questionnaire. Of the 107 students, 86 completed the questionnaire, and this data was used for the study. Data collection was conducted using instruments in the form of a mathematics self-efficacy questionnaire and a questionnaire on students' perceptions of the use of AI (Artificial Intelligence) in their academic activities.

This research instrument consists of 40 questions: 20 on students' self-efficacy and 20 on students' perceptions of the impact of AI (Artificial Intelligence) on their learning outcomes, with four response options: strongly agree, agree, disagree, and strongly disagree. The specifications for each questionnaire are detailed in **Table 1** and **Table 2**.

Table 1. Self-Efficacy Questionnaire Outline

Aspect	Indicator
Level	Questions regarding difficulties with tasks and behavior/attitudes toward tasks.
Strength	Questions regarding the strength or weakness of an individual's confidence and expectations regarding their abilities.
Generalization	The belief that experiences are not an obstacle and that they serve as the foundation for building confidence.

Furthermore, the AI perception questionnaire assesses students' experiences with AI, their perceptions of AI, and its influence on writing skills, as outlined in **Table 2**.

© 2026 Rahayu et al. · CC BY-SA 4.0

Table 2. Students' Perceptions of AI Questionnaire Outline

Aspect	Indicator
Experiences with AI	Questions regarding the frequency, type of AI used, and duration of AI-assisted learning
Students' Perceptions of AI	Students' views on AI, including the ethics and benefits of its use in academic assignments
Impact on Writing Skills	The impact of AI on critical thinking skills, writing skills, and reliance on technology
Attitudes Toward School Policies	Students' support for school policies regarding the use of AI in academic assignments

In this study, the researcher examined the relationship between students' self-efficacy and their perceptions of AI (Artificial Intelligence) on their learning outcomes. Data on students' self-efficacy were collected using a questionnaire, while data on learning outcomes were obtained from the students' midterm and final exam scores provided by the subject teacher. Inferential statistics are used to draw population-level conclusions from sample data (Sugiyono, 2013). Therefore, this study used inferential statistics. The data used in this study are on an interval scale. To determine whether to use parametric or nonparametric statistics, a normality test was conducted first. If the residual data is normally distributed, the analysis proceeded using parametric tests. If the residual data were not normally distributed, the analysis used nonparametric tests.

Data Analysis

The primary analytical technique used was multiple linear regression analysis to test the effects of students' self-efficacy. (X_1) and their perceptions of AI (X_2) on student learning outcomes (Y). Using a regression estimation model.

$$Y = \alpha + b_1X_1 + b_2X_2$$

Multiple linear regression analysis was conducted using SPSS. Before performing the regression analysis, we ensured that the linearity criterion for the relationship between variables was met. Furthermore, the regression model must meet the requirements of the classical assumption tests, which include the residual normality test, the multicollinearity test, the heteroscedasticity test, and the autocorrelation test. However, this study did not perform the autocorrelation test because the data were not time-series data.

RESULTS

This study used two independent variables: students' self-efficacy. (X_1) and students' perceptions of AI (X_2) and one dependent variable, namely student achievement (Y). The study population consisted of 107 students, and a sample of 86 students was selected.

© 2026 Rahayu et al. · CC BY-SA 4.0

Table 3. Results of Descriptive Statistical Analysis

Variable	N	Mean	Std. Deviation
Student self-efficacy	86	41.63	3.932
Perceptions of AI	86	43.51	3.391
Learning Outcomes	86	66.99225	13.655517

Based on **Table 3**, self-efficacy and perception of AI show a consistent trend with low variability, whereas student learning outcomes show significantly higher variability. As a prerequisite for regression analysis, a linearity test was conducted using the criterion "Sig. Deviation from Linearity > 0.05". The results of the linearity test are presented in **Table 4**.

Table 4. Linearity Test Results

	Sig.
Learning Outcomes and Self-Efficacy	.048
Learning Outcomes and Perceptions of AI	.932

Based on **Table 4**, a Sig. value of 0.048 was obtained for the relationship between learning outcomes and self-efficacy. Although 0.048 < 0.05, this value is just below the standard threshold and generally indicates that the data distribution closely follows a linear trend. Therefore, the relationship between students' self-efficacy (X_1) and learning outcomes (Y) is linear. Additionally, the Sig. value for learning outcomes related to perceptions of AI is 0.932, where 0.932 > 0.05. Therefore, it can be stated that the relationship between perceptions of AI (X_2) and learning outcomes (Y) is linear. Thus, the two independent variables are linearly related to the one dependent variable.

Once the requirements are met, the Classical Assumptions Test is conducted in three stages. The Residual Normality Test aims to ensure that the residuals are normally distributed, as required for parametric statistics, with a criterion of Asymp. Sig. (2-tailed) > 0.05. The Multicollinearity Test aims to ensure no strong linear correlation among the independent variables, with criteria of Tolerance > 0.10 and VIF < 10. Finally, the heteroscedasticity test aims to ensure that the residual variances across observations are homogeneous; this is confirmed when the data points on the scatterplot are randomly scattered above and below the 0 mark on the Y-axis without forming any specific pattern.

Table 5. Results of the Classical Assumptions Test

Test Type	Criteria	Results	Interpretation
Residual Normality Test	Sig. > 0.05	0.200	The residuals are normally distributed
Multicollinearity Test	Tolerance > 0.10 and VIF score < 10	Tolerance 0.936 and VIF score 1.068	This regression model is free of multicollinearity.
Heteroscedasticity Test	The data points are scattered randomly and do not form a specific pattern	The data points are scattered randomly and do not form a specific pattern	This regression model is free from heteroscedasticity.

© 2026 Rahayu et al. · CC BY-SA 4.0

Thus, based on **Table 5**, the Classical Assumptions Test was met, and the study proceeded with multiple linear regression analysis. Multiple linear regression analysis was used to test whether self-efficacy and perceptions of AI affected student learning outcomes. The multiple linear regression analysis was conducted using the F-test, t-test, and coefficient of determination. The F-test determined whether the independent variables had a significant combined (simultaneous) effect on the dependent variable. The result of the F-test can be seen in **Table 6**.

Table 6. Results of the F-Test

Regression Model	F	Sig.
Regression	1.669	.195

Based on **Table 6**, an F-value of 1.669 was obtained with a significance level (Sig.) of 0.195. Since the Sig. value is greater than 0.05, it can be concluded that, simultaneously, the student self-efficacy variable (X_1) and the perception of AI variable (X_2) do not have a significant effect on the learning outcome variable (Y). Following the F-test, a t-test (see **Table 7**) was conducted to determine whether the independent variables individually have a significant effect on the dependent variable.

Table 7. Results of the t-test

Variable	Coefficient (B)	T	Sig.
(Constant)	71.057	3.236	.002
Students' self-efficacy	.568	1.470	.145
Perceptions of AI	-.637	-1.421	.159

Based on **Table 7,** the t-value for the student self-efficacy variable was 1.470 with a significance level (Sig.) of 0.145. Since the Sig. is greater than 0.05, it can be concluded that the student self-efficacy variable (X_1) does not have a significant effect on the learning outcome variable (Y). For the variable Perception of AI, a t-value of -1.421 was obtained with a significance value (Sig.) of 0.159. Since the Sig. value is greater than 0.05, it can be concluded that the variable Perception of AI (X_2) does not have a significant effect on the dependent variable Learning Outcomes (Y). Thus, even when considered partially, neither independent variable has a significant effect on the dependent variable. In the coefficient (B) column, the multiple linear regression estimation model in this study yielded the following equation:

$$Y = 71.057 + 0.568X_1 - 0.637X_2$$

This equation can be interpreted to mean that a constant value of 71.057 represents the minimum student achievement score when the two independent variables are set to 0. The regression coefficient for student self-efficacy (X_1) indicates a positive relationship with student achievement; that is, for every one-unit increase in the self-efficacy score, the achievement score is predicted to increase by 0.568. The regression coefficient for perception of AI (X_2) indicates an inverse relationship with student learning outcomes, meaning that for every one-unit increase in the perception of AI score, the learning outcome score is predicted to decrease by 0.637. Next, the analysis of the coefficient of determination is conducted to determine the percentage of influence of the independent variables on the dependent variable. The results of the coefficient of determination analysis are shown in **Table 8.**

© 2026 Rahayu et al. · CC BY-SA 4.0

Table 8. Results of the Coefficient of Determination Analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate
.197	.039	.015	13.549354

Based on **Table 8**, the R-squared value is 0.039. This indicates that self-efficacy and perceptions of AI simultaneously account for 3.9% of the variation in student learning outcomes. Meanwhile, the remaining 96.1% is explained by other variables outside this research model. Thus, the influence of self-efficacy and perceptions of AI on student learning outcomes is very small.

DISCUSSION

The results of the simultaneous tests in **Table 6** indicate that students' self-efficacy and perceptions of Artificial Intelligence (AI) have not yet shown a significant effect on mathematics learning outcomes. These findings suggest that these two variables do not sufficiently explain the variation in learning outcomes when analyzed together. One possibility to consider is that mathematics learning outcomes may also be related to other aspects of the learning process that were not analyzed in this study. Riska and Rahmi (2025) examined the roles of AI and self-efficacy in college students' academic performance. Their study is relevant to this research, although differences in educational levels must be considered when comparing the two studies.

In part, the results in **Table 7** indicate that self-efficacy does not yet significantly affect mathematics learning outcomes. Although the direction of the regression coefficients indicates a positive relationship, these results are not sufficient to conclude that an increase in self-efficacy is followed by a significant improvement in learning outcomes. Theoretically, self-efficacy is related to students' belief in their ability to complete tasks and face learning challenges. However, this belief does not necessarily translate directly into academic achievement. This is consistent with Nur's (2021) study, which examined self-efficacy in relation to mathematics learning achievement through student engagement. Baduri and Nurrahmah (2024), as well as Street et al. (2024), have also examined self-efficacy in the context of mathematics learning and performance. The findings of this study indicate that the relationship between self-efficacy and learning outcomes still needs to be examined by considering other aspects of the learning process.

Students' perceptions of AI also did not significantly affect mathematics learning outcomes, as shown in **Table 7**. The negative regression coefficient does not imply that positive perceptions of AI lead to a decline in learning outcomes. One possibility to consider is that students' perceptions of AI do not always reflect how the technology is used in learning activities. Students may have a positive view of AI, but this does not necessarily reflect the quality of its use in understanding mathematical concepts. Egara et al. (2025) examined high school students' perceptions of using ChatGPT in mathematics learning. Meanwhile, Juanta et al. (2026) and Amalia et al. (2026) discussed AI use in a learning context. These differences in research focus should be noted because this study emphasizes students' perceptions rather than direct observations of AI usage practices.

Based on **Table 8**, students' self-efficacy and perceptions of AI can explain only a small portion of the variation in mathematics learning outcomes. This indicates that the research model has not yet fully explained learning outcomes. The unexplained variation may be related to other aspects not included in the model, but this possibility cannot be confirmed through this study. Future research could consider

 © 2026 Rahayu et al. · CC BY-SA 4.0

several aspects, such as engagement in learning, self-regulation, and prior mathematical ability. By including relevant additional variables, the relationship between various aspects of learning and mathematics learning outcomes can be examined more comprehensively.

This study has limitations regarding the scope of the respondents, who were exclusively 11th-grade students at a high school in Bandung. Additionally, perceptions of AI were measured through a questionnaire, so the results do not fully reflect actual AI use in mathematics instruction. Future research could include respondents from a wider range of schools and use interviews or observations to understand AI use better. In classroom practice, teachers can guide students to use AI critically and responsibly while also fostering students' confidence in solving math problems independently. These are practical recommendations worth considering; they are not direct findings proven by this study.

CONCLUSION

Based on the results of the data analysis, it can be concluded that self-efficacy and perceptions of Artificial Intelligence (AI), when considered together, do not have a significant effect on the mathematics learning outcomes of students in high school. Partially, self-efficacy also does not significantly affect mathematics learning outcomes, although it shows a positive relationship. Meanwhile, perceptions regarding AI show a non-significant, negative relationship. Thus, the research hypothesis stating that self-efficacy and perceptions regarding AI show a negative and non-significant relationship is supported. Thus, the research hypothesis that self-efficacy and perceptions of AI affect mathematics learning outcomes cannot be supported by this study's findings.

These results indicate that students' mindsets about their abilities and their perceptions of AI technology do not necessarily directly influence their mathematics learning achievements. A non-significant relationship is also shown by the variable of perceptions regarding AI, which tends to be negative. This indicates that AI technology at the high school level has not been optimally used to develop deep conceptual understanding, but may instead be used pragmatically to seek instant answers, which can trigger digital dependency. Therefore, using AI in mathematics learning requires teacher guidance and supervision to ensure it serves as a tool for developing critical thinking skills, rather than merely a machine for finding final answers. Students also need to cultivate good self-regulation to avoid becoming trapped in technological dependency. This study is limited by the variables used to explain mathematics learning outcomes, as self-efficacy and perceptions of AI may not adequately represent all factors influencing students' achievements. Therefore, future research is suggested to include other relevant variables, expand the scope of research participants, and further investigate how the use of AI in mathematics learning may influence students' conceptual understanding and learning outcomes.

DECLARATIONS

Author Contributions: All authors contributed to the research and article, including developing the idea, designing the methodology, collecting and analyzing data, interpreting results, and writing and editing the manuscript. All approved the final version.

Funding: This research received no external funding.

Ethics Approval and Consent: The school principal approved the study, which involved 11th-grade students. Researchers collected data through questionnaires and math learning results.

 © 2026 Rahayu et al. · CC BY-SA 4.0

Data Availability: Data were collected at a Bandung high school through questionnaires on students' self-efficacy and perceptions of AI, and mathematics outcomes recorded by subject teachers. Because the data include academic information, they are not publicly available. The corresponding author may provide access upon reasonable request, subject to confidentiality requirements.

Conflict of Interest: The authors stated that this study has no conflicts of interest. This research was motivated by the growing use of Artificial Intelligence (AI) in the digital era, which led the researchers to examine students' perceptions of using AI in learning mathematics.

Use of Generative AI: During research and manuscript preparation, the authors used generative AI tools to process questionnaire data and student learning outcomes, suggest academic English vocabulary and phrasing, and check formatting against the publisher's guidelines. They reviewed and verified all suggestions and remain fully responsible for the data's accuracy, analysis results, and final manuscript.

REFERENCES

Abdurrahman, A. R., Rizki, M. B., & Pradana, R. B. (2025). Pengaruh Penggunaan AI terhadap Kompetensi dan Motivasi Belajar Mahasiswa. *JATI (Jurnal Mahasiswa Teknik Informatika)*, *9*(1), 201–210. https://doi.org/10.36040/jati.v9i1.12205

Acosta-Enriquez, B. G., Arbulú Ballesteros, M. A., Guzman Valle, M. A., Morales Angaspilco, J. E., Aquino Lalupú, J. del R., Bravo Jaico, J. L., Germán Reyes, N. C., Alarcón García, R. E., & Janampa Castillo, W. E. (2025). The mediating role of academic stress, critical thinking, and performance expectations in the influence of academic self-efficacy on AI dependence: A case study in college students. Computers and Education: Artificial Intelligence, 8, Article 100381. https://doi.org/10.1016/j.caeai.2025.100381

Amalia, F. R., Nurmalasari, N., & Arjudin. (2026). Pemanfaatan Artificial Intelligence untuk Meningkatkan Hasil Belajar Matematika Siswa Kelas XI.3 SMAN 3 Mataram. *Jurnal Profesi Guru Indonesia (JPGI)*, *2*(1), 47–50.

Baduri, J., & Nurrahmah, A. (2024).Pengaruh Efikasi Diri terhadap Hasil Belajar Matematika Siswa Kelas X SMAN di Jakarta Barat. *Jurnal Derivat*, 11(2), 147–156. https://doi.org/10.31316/jderivat.v10i2.6496

Cahyani, N., & Winata, H. (2020). Peran Efikasi Diri dan Disiplin Diri dalam Peningkatan Hasil Belajar Siswa. *Jurnal Pendidikan Manajemen Perkantoran*, *5*(2), 234–249. https://doi.org/10.17509/jpm.v5i2.28841

Egara, F. O., Mosimege, M., & Mosia, M. (2025). Secondary school students' perceptions of their usage of artificial intelligence-based ChatGPT in mathematics learning. Journal of Education, (98). https://doi.org/10.17159/2520-9868/i98a07

Estrada-Araoz, E. G., Mamani-Roque, M., Quispe-Aquise, J., Manrique-Jaramillo, Y. V., & Cruz-Laricano, E. O. (2025). Academic self-efficacy and dependence on artificial intelligence in a sample of university students. Sapienza: International Journal of Interdisciplinary Studies, 6(1), Article e25008. https://doi.org/10.51798/sijis.v6i1.916

Hwang, G.-J., & Tu, Y.-F. (2021). Roles and research trends of artificial intelligence in mathematics education: A bibliometric mapping analysis and systematic review. Mathematics, 9(6), Article 584. https://doi.org/10.3390/math9060584

 © 2026 Rahayu et al. · CC BY-SA 4.0

Juanta, P., Husada, S. P., Hutagalung, B. S., & Pasaribu, J. F. (2026). Pengaruh Penggunaan AI terhadap Nilai Hasil Belajar Siswa Kelas X SMAS Katolik Tri Sakti Kota Medan Tahun Ajaran 2025/2026. *Educational Journal*, *1*(4), 1264–1299.

Joshi, D. R., Khanal, B., Chapai, K. P. S., & Singh, A. B. (2026). Role of secondary school students' AI acceptance in mathematics learning in shaping academic achievement. Social Sciences & Humanities Open.

Krisdianto, J., & Roesdiana, L. (2025). Eksplorasi persepsi siswa terhadap penggunaan AI dalam meningkatkan pemahaman konsep matematis pada siswa SMP. Pedagogy: Jurnal Pendidikan Matematika, 10(4), 2653–2666. https://doi.org/10.30605/pedagogy.v10i4.7659

Kurniawati, H., & Liana, C. (2022). Pengaruh Efikasi Diri (*Self Efficacy*) terhadap Hasil Belajar Sejarah Siswa Kelas XI IPS MAN 1 Bojonegoro. *AVATARA: e-Journal Pendidikan Sejarah*, *12*(1), 1–10.

Lampert, J. N. (2007). *The Relationship of Self-Efficacy and Self-Concept to Academic Performance in a College Sample: Testing Competing Models and Measures* (Master's thesis, Pacific University). Pacific University CommonKnowledge.

Nugroho, I. S., Yohanie, D. D., & Darsono, D. (2026). Exploring senior high school students' perceptions of artificial intelligence as a mathematics learning assistant. Jurnal Pendidikan Matematika (JPM), 12(2), 165–179. https://doi.org/10.33474/jpm.v12i2.25877

Nur, M. A. (2021). Pengaruh Efikasi Diri terhadap Prestasi Belajar Matematika Melalui Keterlibatan Belajar Siswa Kelas XI SMA Negeri 2 Bulukumba. *Infinity: Jurnal Matematika dan Aplikasinya (IJMA)*, *2*(1), 1–10. https://doi.org/10.30605/27458326-54

Rahmawati, N., Daud, F., & Bahri, A. (2024). The correlation between self-efficacy, self-confidence, and metacognitive skills on biology learning outcomes of student's high school. Biosfer: Jurnal Pendidikan Biologi, 17(2), 473–484. https://doi.org/10.21009/biosferjpb.43918

Riska, M., & Rahmi, E. (2025). Peran Artificial Intelligence (AI) dan Efikasi Diri dalam Meningkatkan Performa Akademik Mahasiswa. *Andragogi: Jurnal Pendidikan dan Pembelajaran, 5*(2), 14–31. https://doi.org/10.31538/adrg.v5i2.2359

Sahabuddin, R., Azhari, A., Natasya, W., Annisa, M. A., Putra, M. D. P., & Marpia. (2025). Dampak Penggunaan AI dalam Meningkatkan Efisiensi Belajar Mahasiswa: Studi tentang Ketergantungan dan Kemampuan Kritis. *Jurnal Rumpun Manajemen dan Ekonomi, 2*(3), 421–430.

Street, K. E. S., Malmberg, L.-E., & Schukajlow, S. (2024). Students' mathematics self-efficacy: A scoping review. ZDM–Mathematics Education, 56, 265–280.

Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Wulanningtyas, M. E., & Ate, H. M. (2020).Pengaruh Efikasi Diri Siswa terhadap Prestasi Belajar Matematika. Dalam *Prosiding Konferensi Pendidikan Nasional: Strategi dan Implementasi Pendidikan Karakter pada Era Revolusi Industri 4.0* (hlm. 166).

Zahara, S. L., Azkia, Z. U., & Chusni, M. M. (2023). Implementasi Teknologi Artificial Intelligence (AI) dalam Bidang Pendidikan. *JPSP: Jurnal Penelitian Sains dan Pendidikan*, 3(1), 15–20 https://doi.org/10.23971/jpsp.v3i1.4022

 © 2026 Rahayu et al. · CC BY-SA 4.0