1st BICONE (Bhinneka Conference)
Empowering Society 5.0: Education, Technology, and Social Transformation
Vol 1 No 1 , 2025

THE EFFECT OF USING ARTIFICIAL INTELLIGENCE ON STUDENTS' LEARNING MOTIVATION IN THE DDTJKT SUBJECT IN GRADE X AT SMKN 1 REJOTANGAN

Dwi Sukma Agus Septian[1)], Abdul Haris Indrakusuma[2)]
1. Information Technology Education, Faculty of Science and Technology, Bhinneka PGRI University, Indonesia
Email address : dwisukmaas32@gmail.com
2. Information Technology Education, Faculty of Science and Technology, Bhinneka PGRI University, Indonesia
Email address : abdulharisindrakusuma@gmail.com

***Abstract*—The development of Artificial Intelligence (AI) has a major impact on education, including increasing student learning motivation. This study aims to determine whether or not the use of AI Tools has an effect on student learning motivation in the subject of Basics of Computer Network Engineering and Telecommunications (DDTJKT) at SMKN 1 Rejotangan. The method used is quantitative with an ex post facto correlational design. A sample of 85 students was randomly selected from a population of 106 class X students. Data was obtained using a questionnaire. From the results of the data obtained, data analysis was carried out using simple linear regression with the help of SPSS 23, including normality, linearity, and heteroscedasticity tests. The test results show a calculated t of 11.465 > t table 1.989 and a significance of 0.000 < 0.05. The regression equation Y = 10.247 + 0.773X indicates a positive and significant effect. Thus, the use of AI Tools such as ChatGPT and Gemini is proven to increase student learning motivation.**

Keywords—AI Tools, ChatGPT, DDTJKT, Gemini, Learning Motivation.

I. INTRODUCTION (*HEADING 1*)

Development Artifial Intellingence(AI) brings major changes in the world of education, including in improving the personalization of learning and student interaction [1]. AI enables an adaptive learning system, where teaching materials and methods can be tailored to the needs and learning styles of each student. In the context of Vocational High Schools (SMK), the application of AI is important because it can help students understand complex concepts more practically and visually, especially in technology fields such as Computer Network and Telecommunication Engineering (TJKT). This is in line with the direction of the Independent Curriculum which emphasizes digital transformation, independent learning, and strengthening 21st-century competencies [2].

However, the results of interviews with teachers of the Basics of Computer Network Engineering and Telecommunications (DDTJKT) at SMKN 1 Rejotangan on February 6, 2025, showed problems with student learning motivation. The teacher revealed that most students did not participate actively, showed low interest in learning, and tended to be passive during the learning process. This condition shows that the learning approach used has not been able to optimally arouse students' enthusiasm for learning. On the other hand, the learning method that is still predominantly used, namely conventional lectures, is considered less effective in conveying technical material that requires conceptual understanding and direct practice [3]. states that a one-way approach such as lectures is less able to answer the challenges of 21st-century learning that demands active involvement, collaboration, and creative problem solving (2).

Given these conditions, the use of AI tools like ChatGPT and Gemini in the learning process can be an innovative solution. These tools can provide interactive explanations, help students quickly find references, and provide simulations or practical examples of the concepts being taught.

Therefore, this study aims to determine whether or not there is an influence of the use of AI tools on the learning motivation of class X students in the DDTJKT subject at SMKN 1 Rejotangan. The results of this study are expected to contribute to the development of technology-based learning strategies that are more effective, relevant, and appropriate to the characteristics of vocational school students (3).

A. Artificial Intelligence (AI) Tools

Artificial Intelligence (AI) is a field in computer science that emphasizes the development of systems capable of mimicking human intelligence such as thinking, learning, and problem solving. In education, AI is used to create adaptive systems, automate assessments, and personalize learning [4].

According to Zawacki-Richter et al. [5], indicators for the use of AI tools in education include: 1). Personalization of learning, 2). Intelligent tutoring systems, 3). Automatic assessment, 4). Adaptive learning environments, 5). Learning analysis and prediction.

AI has positive impacts such as teaching efficiency and increased student engagement, but it also poses risks such as dependency, access gaps, and data security [6]. AI functions help make learning decisions more accurate and adaptive [7].

B. Student Learning Motivation

Learning motivation is an internal or external drive that drives students to actively participate in the learning process. Motivation is divided into intrinsic and extrinsic. Indicators include interest in the material, independence, active participation, response to feedback, and improved achievement [8].

Factors that influence motivation include the learning environment, the role of the teacher, and socio-economic conditions [9]. Its function is to encourage effort and provide direction in choosing effective learning strategies [10].

C. DDTJKT Subjects

DDTJKT (Basics of Computer Network and Telecommunication Engineering) is a compulsory subject for the TJKT expertise program at vocational schools which aims to equip students with basic knowledge of networks and telecommunications [11].

The learning models used include PBL, PJBL, and Blended Learning. Technologies such as AI tools, such as ChatGPT, are used to support the interactive learning process [12].

Evaluation is conducted through formative and summative approaches, encompassing both practice and theory. This subject is highly relevant in shaping students' readiness to face the demands of a technology-based workplace [8].

D. Research Hypothesis

H_0: There is no significant influence between Artificial Intelligence (AI) tools on students' learning motivation in the DDTJKT subject for class X at SMKN 1 Rejotangan.

H_1: There is a significant influence between Artificial Intelligence (AI) tools on students' learning motivation in the DDTJKT subject for class X at SMKN 1 Rejotangan.

II. Research Methods

A. Type, Approach, Location, Time, Population and Research Sample

This study uses a quantitative approach with an ex post facto correlational design to analyze the effect of using AI tools (independent variable, X) on student learning motivation (dependent variable, Y) in the Basics of Computer Network and Telecommunication Engineering (DDTJKT) subject at SMKN 1 Rejotangan. This approach was chosen because the researcher did not provide direct treatment to the variables, but rather observed the cause-effect relationship based on data that had occurred [13].

Variables of AI tool usage include personalized learning, intelligent tutoring systems, automated feedback, and adaptive learning environments [5]. Meanwhile, student learning motivation is measured based on five indicators, namely interest in the material, learning independence, active participation, response to feedback, and improved learning outcomes [8].

This research was conducted at SMKN 1 Rejotangan, Tulungagung Regency, during the even semester of the 2024/2025 academic year, from March 7 to June 30, 2025. The research population included all 106 students of class X DDTJKT SMKN 1 Rejotangan, and the sample was determined as 85 students using a random sampling technique with the Slovin formula at an error rate of 5% [14].

TABLE I. Research Instrument Variables and Indicators

Variables	No	Indicator	Instrument Type
X	Use of AI Tools	1. Personalization of Learning 2. Intelligent Guidance System 3. Automatic Assessment and Feedback 4. Adaptive Learning Environment 5. Learning Analysis and Prediction Source: Zawaki – Richter et al. (2019)	Questionnaire
Y	Student Learning Motivation	1. Interest in Learning Materials. 2. Independence in Learning. 3. Active Participation in the Learning Process. 4. Response to Feedback 5. Improving Learning Outcomes Source: (Gultom et al., 2024)	Questionnaire

B. Instruments, Data Collection, and Analysis

The research instrument was a closed questionnaire with a Likert scale of 1–5 consisting of 25 statement items. The instrument's content validity was tested through expert judgment, while its construct validity was analyzed using Pearson Product Moment correlation. The instrument's reliability was tested using Cronbach's Alpha technique with a value criterion of $\geqslant 0.70$ through the assistance of SPSS software version 23.0 [15]. Data collection was carried out by distributing questionnaires to respondents. Data analysis began with prerequisite tests, namely the normality test using Kolmogorov–Smirnov, the linearity test using ANOVA, and the heteroscedasticity test using the Glejser method. Next, a simple linear regression analysis was conducted to determine the effect of variable X on variable Y, which was tested through a t-test at a significance level of 5% [16]. The research procedure included the stages of instrument preparation and validation, data collection, instrument validity and reliability testing, data analysis, and conclusion drawing.

III. Research Result

A. Presentation and Research Results

This research was conducted on May 22, 2025, at SMKN 1 Rejotangan. The process began with problem observation, questionnaire development, and instrument validation by the supervising lecturer. A pilot test was conducted on 21 grade X DDTJKT students to assess validity and reliability using SPSS version 23.0, and all items were declared valid and reliable.

The main questionnaire was then distributed to 85 students. The data were analyzed through large-scale validity and reliability tests, followed by prerequisite tests for regression analysis (normality, linearity, and heteroscedasticity). After meeting all assumptions, a simple linear regression analysis and a t-test were conducted to

examine the effect of AI Tools use on student learning motivation in the DDTJKT subject.

Data analysis in this study was conducted systematically to test the effect of the independent variables on the dependent variable. The testing began with instrument validity and reliability tests to ensure data quality, followed by analysis prerequisite tests such as normality, linearity, and heteroscedasticity. Once all requirements were met, a simple linear regression hypothesis test was conducted to determine the extent of the influence of AI tool use on student learning motivation.

The analysis results show that all instrument items are valid and reliable, the data are normally distributed, the Kolmogorov-Smirnov significance value of 0.200 > 0.05 indicates a normal data distribution, has a linear relationship, and does not experience symptoms of heteroscedasticity. Hypothesis test resultsshows that the calculated t value of 11.465 exceeds the t table value of 1.989so that H_0 is rejected and H_1 is accepted, which means there is an influence between the use of AI Tools and students' learning motivation.The regression test produced an equation model of Y = 10.247 + 0.773X with a significance value of 0.000 < 0.05, which means there is a significant influence between the use of AI Tools on learning motivation. The coefficient of determination (R Square) of 0.613 indicates that 61.3% of the learning motivation variable can be explained by the use of AI Tools variable.

B. Instrument Validity and Reliability Test

TABLE II. VALIDITY TEST OF AI TOOLS USAGE INSTRUMENT

Item Number	*Pearson Correlation*	*r table*	*Information*
1	0,866	0,433	Valid
2	0,845	0,433	Valid
3	0,865	0,433	Valid
4	0,810	0,433	Valid
5	0,875	0,433	Valid
6	0,826	0,433	Valid
7	0,783	0,433	Valid
8	0,817	0,433	Valid
9	0,827	0,433	Valid
10	0,825	0,433	Valid
11	0,880	0,433	Valid
12	0,822	0,433	Valid

Source: SPSS 23.0 Output Results, 2025

Based on the results of the validity test using the Pearson Product Moment formula, all items of the AI Tools Usage instrument have a correlation coefficient (r count) greater than the r table value of 0.433. Therefore, it can be concluded that all items are valid and can be used in the study.

TABLE III. VALIDITY TEST OF LEARNING MOTIVATION INSTRUMENT VALIDITY TEST OF AI TOOLS USAGE INSTRUMENT

Item Number	*Pearson Correlation*	*r table*	*Information*
13	0,834	0,433	Valid
14	0,743	0,433	Valid
15	0,851	0,433	Valid
16	0,928	0,433	Valid
17	0,832	0,433	Valid
18	0,778	0,433	Valid
19	0,897	0,433	Valid
20	0,723	0,433	Valid
21	0,917	0,433	Valid
22	0,932	0,433	Valid
23	0,745	0,433	Valid
24	0,912	0,433	Valid
25	0,827	0,433	Valid

Source: SPSS 23.0 Output Results, 2025

The results of the validity test for the Learning Motivation instrument show that all items have a Pearson correlation coefficient greater than the r table value of 0.433. Therefore, it can be concluded that all items are valid and can be reliably used for further analysis in this research.

C. Prerequisite Analysis Test

The normality test using the Kolmogorov-Smirnov method yielded a significance value of 0.200 > 0.05, indicating that the residual data were normally distributed. This is also supported by the Normal P-plot curve, where the points are spread around the diagonal line. Thus, the data meets the assumption of normality and is suitable for use in regression analysis.

The following table shows the results of the Linearity Test and Heteroscedasticity Test:

TABLE IV. LINEARITY TEST

Aspects Tested	*Say*	a (5%)
Linearity	0,000	0,05
Deviation from Linearity	0,644	0,05

Source: SPSS 23.0 Output Results, 2025

The linearity test results showed a linearity significance value of 0.000 < 0.05 and a deviation from linearity of 0.644 > 0.05. This indicates a significant linear relationship between the use of AI tools and student learning motivation, with no deviation from linearity. Therefore, a simple linear regression analysis can be performed.

TABLE V. UJI HESTEROSKEDASTICITY

Aspects Tested	*Say. (p-value)*	a (5%)
Usage *Artifial Intellingence*(X)	0,091	0,05

Source: SPSS 23.0 Output Results, 2025

The Glejser test showed a significance value of 0.091 > 0.05, indicating no heteroscedasticity in the regression model. This indicates that the residual variance is evenly distributed and the regression model is suitable for further use.

D. Hypothesis Testing (t-Test and Simple Linear Regression)

This hypothesis test aims to determine whether there is a significant influence between the use of*Artifial Intellingence*(X) on Student Learning Motivation (Y) in the subject of Basics of Computer Network Engineering and Telecommunications (DDTJKT) for class X at SMKN 1 Rejotangan.

TABLE VI. HYPOTHESIS TESTING

NO	Constant (a)	B	T count	T table	Sig (p)	a (5%)	R	R
1	10,247	0,773	11,465	1,989	0,000	0,05	0,783	0,613

Source: SPSS 23.0 Output Results, 2025

The results of simple linear regression analysis show that the use of AI Tools has a significant effect on student learning motivation. The regression coefficient value is 0.773 with a calculated t value of 11.465> t table 1.989 and a significance of 0.000 <0.05, so H_0 is rejected. The correlation coefficient (R) of 0.783 indicates a strong relationship, and the R Square value of 0.613 indicates that 61.3% of the learning motivation variable can be explained by the use of AI Tools. Thus, AI Tools are proven effective in increasing the learning motivation of class X students in the DDTJKT subject at SMKN 1 Rejotangan.

Simple Linear Regression Analysis Equation:

$$Y = 10.247 + 0.773X \quad (1)$$

Where:

- Y = Predicted value of students' learning motivation
- X = Use of AI Tools
- 10.247 = Constant (intercept), representing the predicted value of Y when $X = 0$ X=0
- 0.773 = Regression coefficient, indicating that for each 1-unit increase in AI Tools usage, the students' learning motivation increases by 0.773 units

Interpretation: The constant 10.247 indicates the motivation value when AI Tools = 0. The coefficient of 0.773 means that every increase of one unit of AI Tools increases learning motivation by 0.773 points. R = 0.783 (strong correlation); R Square = 0.613 (61.3% of motivation is explained by AI Tools).

IV. DISCUSSION

A. Statistical Interpretation

The study was conducted on 85 grade X DDTJKT students of SMKN 1 Rejotangan using a questionnaire that had been tested for validity and reliability. The results of the validity test showed that all items in both variables were valid, with r count > r table. The reliability test also showed high results (AI Tools = 0.959; Learning Motivation = 0.964), so the instrument was suitable for use.

The primary data were tested through regression analysis prerequisites. The results of the normality test (Sig. = 0.200 > 0.05) indicated a normal distribution. The linearity test showed a linear relationship between AI Tools and learning motivation (Sig. linearity = 0.000; deviation from linearity = 0.644). The heteroscedasticity test (Sig. = 0.091) indicated the model was free from heteroscedasticity symptoms.

Linear regression produces the equation Y = 10.247 + 0.773X, indicating that each increase in the use of AI Tools by one unit can increase learning motivation by 0.773 points. The R^2 value = 0.613 indicates a 61.3% contribution of AI Tools to learning motivation, with R = 0.783 indicating a strong relationship. The results of the t-test (t count = 11.465 > t table = 1.989; p = 0.000) prove a significant effect.

B. Comparison of Research Results with Theory

The results of this study indicate that the use of AI tools has a positive influence on students' learning motivation in the Basics of Computer Network Engineering and Telecommunications (DDTJKT) subject. This finding aligns with theory.*Artifial Intellingence*As proposed by Russell and Norvig [17], artificial intelligence is designed to mimic human thought processes through adaptive and responsive learning systems. In the context of learning, AI provides easy access to materials, personalized learning, and rapid feedback—all of which were experienced by students in this study. Students felt that AI tools made it easier to understand the material, accelerated the evaluation process, and increased learning efficiency.

From a motivational perspective, these findings support the learning motivation theory proposed by Prihartanta et al. [18] and Wahyuni [19], which states that external factors such as the use of modern learning technology and media can influence students' intrinsic motivation. AI tools applied in learning act as an external stimulus that encourages students to be more active and enthusiastic in participating in learning activities.

Furthermore, the learning motivation indicators as stated by Gultom et al. [20], namely interest in the material, activeness in learning, response to feedback, and achievement of learning outcomes, were all achieved in the implementation of AI Tools. This is reflected in the high average value of student learning motivation for each of these

indicators, as shown in the results of descriptive and regression analysis in this study.

This result is also consistent with previous research findings.by Santoso [21] and Setiawan [22]which demonstrates that the application of digital technology, including AI in learning, has a significant impact on increasing student participation and motivation, particularly in vocational education. Both highlighted that digitalization of learning can increase the relevance of material to the workplace and create a more engaging and contextual learning experience, a practice reflected in the AI-based DDTJKT learning at SMKN 1 Rejotangan.

Overall, this study not only supports previous theories and findings, but also provides new empirical contributions regarding the effectiveness of AI Tools in increasing vocational high school students' learning motivation in the digital era, especially in the context of vocational lessons based on network and telecommunication technology.

C. *Relevant Research Studies*

The results of this study are in line with various previous studies which show that the use of artificial intelligence (AI)-based technology contributes positively to increasing students' learning motivation.

Yunarzat et al. [23] found that the use of ChatGPT in the learning process at vocational schools significantly increased students' learning motivation. Although the AI tools used in this study were not limited to ChatGPT, this finding is still supportive because it demonstrates the effectiveness of AI in the context of vocational education.

Research by Naila et al. [24] confirms that AI has the potential to increase student learning motivation through a constructivist approach based on Carl Rogers' humanistic learning theory. These results reinforce the view that AI can be an external stimulus capable of encouraging students' internal motivational aspects.

Meanwhile, Mardika [25] proved that the use of AI-based Wordwalls was able to increase learning motivation in non-ICT subjects at the junior high school level. This shows that AI has flexibility in various subject contexts and educational levels.

Safitri et al. [26] in their research found that an AI Chatbot designed as an interactive learning assistant successfully increased student participation and interest in learning at the high school level. This finding confirms that two-way communication facilitated by AI is able to build more active student involvement in the learning process.

Furthermore, Al Mas et al. [27] found that the use of AI technology and digital literacy had a significant impact on vocational school students' learning interests. AI not only functions as a learning tool, but also supports the development of digital skills that are important in the modern era.

Overall, the above studies support the results of this study and add to the empirical basis that AI Tools are an effective means of increasing learning motivation, especially in learning the Basics of Computer Network Engineering and Telecommunications (DDTJKT) subject in the vocational high school environment.

V. CONCLUSION

A. *Conclusion*

This study concludes that the use of*Artifial Intellingence*has a significant and positive effect on the learning motivation of class X TJKT students of SMKN 1 Rejotangan in the DDTJKT subject. The research instrument has been tested valid and reliable, and the data meets the assumptions of regression analysis (normality, linearity, and heteroscedasticity). The t-test results show t count 11.465 > t table 1.989 with a significance of 0.000 < 0.05, meaning that there is a significant influence between the use of AI Tools on learning motivation. The regression equation Y = 10.247 + 0.773X shows that the higher the use of AI Tools, the higher the student's learning motivation. AI Tools are proven to help personalize learning, provide automatic feedback, and increase active student engagement. Therefore, the use of AI Tools is highly recommended in learning strategies.

B. *Suggestion*

The results of this study offer suggestions to related parties based on the following research findings:

1) Parents: Need to support the positive use of AI at home and facilitate access to learning technologies
2) For children. Students: It is recommended that they actively utilize AI tools to learn, increase independence, and understand the material more deeply.
3) Teacher: It is recommended to integrate AI Tools in DDTJKT learning and improve digital literacy so that its utilization is maximized.
4) Schools and Communities: Schools need to provide technology facilities and training, as well as outreach to students and parents. Communities are expected to support a technology-friendly educational environment.
5) Further Research: It is recommended to examine other variables such as learning outcomes or creativity, try mixed methods, and expand the subject to different levels and subjects for more comprehensive results.

ACKNOWLEDGMENT *(Heading 5)*

The researcher would like to express sincere gratitude to the Supervisor for the invaluable guidance, direction, and encouragement provided throughout the completion of this research. Special thanks are also extended to the Principal, teachers, and all Grade X students of the Computer Network and Telecommunication Engineering (TJKT) Program at SMKN 1 Rejotangan for their support, participation, and willingness to provide the necessary data for this study.

REFERENCES

[1] R. A. Mahesa, Pemanfaatan Kecerdasan Buatan dalam Pendidikan di Era Digital, Jakarta: Prenada Media, 2024.

[2] L. Yulianti, D. Rahmawati, and A. Setiawan, "Transformasi Digital dalam Implementasi Kurikulum Merdeka: Menjawab Tantangan

Pendidikan Abad 21," Jurnal Pendidikan dan Teknologi, vol. 7, no. 2, pp. 145–158, 2023.

[3] Z. Abidin, Strategi Pembelajaran Inovatif di Era Digital, Yogyakarta: Deepublish, 2023.

[4] S. J. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 4th ed., Pearson, 2021.

[5] O. Zawacki-Richter, V. I. Marín, M. Bond, and F. Gouverneur, "Systematic Review of Research on Artificial Intelligence Applications in Higher Education," Int. J. Educ. Technol. High. Educ., vol. 16, no. 39, 2019.

[6] U. Darwis, Dampak Penggunaan AI dalam Pendidikan, Surabaya: Literasi Digital Press, 2024.

[7] A. Rochim, "Keputusan Berbasis AI dalam Pembelajaran," J. Teknol. Pendidikan, 2024.

[8] E. Gultom, R. Siregar, and N. Hidayat, "AI Tools dan Efektivitas Pembelajaran Siswa SMK," J. Ilmu Pendidikan Vokasi, 2024.

[9] E. Setyawati and Y. Subowo, Peran Lingkungan dalam Meningkatkan Motivasi Belajar, Yogyakarta: Andi, 2018.

[10] R. Gule and R. Th, "Faktor Internal dan Eksternal Motivasi Belajar," J. Psikol. Pendidikan, 2022.

[11] BSKAP Kemendikbud, Keputusan No. 033/H/KR/2022 tentang Capaian Pembelajaran SMK Program Keahlian TJKT, Jakarta: Kemendikbudristek, 2022.

[12] R. Setiawan, "Inovasi Model Pembelajaran Interaktif," J. Penelitian Pendidikan, 2023.

[13] S. Arikunto, Prosedur Penelitian: Suatu Pendekatan Praktik, Jakarta: Rineka Cipta, 2002.

[14] P. Wiyono, Statistik Pendidikan, Malang: UM Press, 2011.

[15] Sugiyono, Metode Penelitian Kuantitatif, Kualitatif, dan R&D, Bandung: Alfabeta, 2015.

[16] Riduwan, Metode dan Teknik Menyusun Tesis, Bandung: Alfabeta, 2008.

[17] S. J. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 4th ed., Pearson, 2020.

[18] W. Prihartanta, "Teori-teori motivasi," J. Adabiya, vol. 1, no. 83, pp. 1–14, 2015.

[19] S. Wahyuni, "Pengaruh media teknologi terhadap motivasi belajar siswa," J. Pendidikan Teknologi dan Kejuruan, vol. 17, no. 1, pp. 22–30, 2020.

[20] E. H. Gultom, P. Siahaan, and E. Simanjuntak, "Motivasi belajar siswa dalam pembelajaran berbasis AI," J. Pendidikan Inovatif, vol. 8, no. 2, pp. 135–144, 2024.

[21] H. Santoso, Teknologi Pembelajaran Era Digital, Bandung: Informatika, 2023.

[22] A. Setiawan, Strategi Pembelajaran Berbasis Teknologi di SMK, Surabaya: Erlangga, 2023.

[23] E. Yunarzat, S. C. Sida, and K. Kasman, "Pengaruh Penggunaan ChatGPT terhadap Motivasi Belajar Siswa di Sekolah Menengah Kejuruan," Edukatif: J. Ilmu Pendidikan, vol. 6, no. 2, pp. 1607–1626, 2024.

[24] I. Naila, A. Atmoko, R. S. Dewi, and W. Kusumajanti, "Pengaruh Artificial Intelligence Tools terhadap Motivasi Belajar Siswa Ditinjau dari Teori Rogers," At-Thullab: J. Pendidikan Guru Madrasah Ibtidaiyah, 2023.

[25] A. Mardika, "Pengaruh Wordwall terhadap Motivasi Belajar PPKn," J. Inovasi Pendidikan, vol. 7, no. 1, pp. 45–58, 2024.

[26] A. Safitri, D. Nugroho, and F. Utami, "Penggunaan Chatbot Berbasis AI untuk Meningkatkan Motivasi Belajar Siswa SMA," J. Inovasi Pendidikan dan Pembelajaran Digital, vol. 2, no. 1, pp. 55–63, 2024.

[27] K. U. Al Mas, N. Ramadhani, S. Mardiah, D. A. Zahara, S. E. Aulia, and A. T. Umar, "Pengaruh Penggunaan Teknologi AI dan Literasi Digital terhadap Minat Belajar Siswa Kelas XI Jurusan Perkantoran di SMKN 1 Medan," J. Rev. Pendidikan dan Pengajaran (JRPP), vol. 7, no. 3, pp. 7907–7913, 2024.