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Artificial Intelligence Improving Student Learning Achievement

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ABSTRACT

This study examines the application of Artificial Intelligence (AI) in Education, mainly focusing on its impact on student achievement in the Pancasila and Citizenship Education Program at STKIP Pasundan. Students often face challenges when dealing with complex and abstract materials in civic Education. The research employs a quantitative approach, using random sampling and multiple linear regression analysis to assess the influence of AI. The findings reveal that ChatGPT is the most commonly used AI platform among students, valued for its user-friendly features and effective response capabilities. The analysis confirms that AI significantly affects student learning achievement, and its contribution is substantial compared to other influencing factors. Additionally, AI enhances student motivation, material absorption, and innovation in the learning process. In conclusion, AI positively and significantly impacts student achievement and can be integrated into educational practices to foster more innovative and practical learning in the digital era.

***Keywords*:**
Artificial Intelligence (AI); Learning Achievement; Civic Education; Learning Innovation.

ABSTRAK

Penelitian ini mengkaji penerapan Artificial Intelligence (AI) dalam pendidikan, terutama berfokus pada dampaknya terhadap prestasi siswa pada Program Pendidikan Pancasila dan Kewarganegaraan STKIP Pasundan. Siswa sering menghadapi tantangan ketika berhadapan dengan materi yang kompleks dan abstrak dalam pendidikan kewarganegaraan.

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Penelitian ini menggunakan pendekatan kuantitatif, menggunakan pengambilan sampel acak dan analisis regresi linier berganda untuk menilai pengaruh AI. Temuan ini mengungkapkan bahwa ChatGPT adalah platform AI yang paling umum digunakan di kalangan mahasiswa, karena fitur-fiturnya yang ramah pengguna dan kemampuan respons yang efektif. Analisis tersebut menegaskan bahwa AI secara signifikan memengaruhi prestasi belajar siswa, dan kontribusinya sangat besar dibandingkan dengan faktor lain yang mempengaruhi. Selain itu, AI ditemukan untuk meningkatkan motivasi siswa, penyerapan materi, dan inovasi dalam proses pembelajaran. Kesimpulannya, AI memiliki dampak positif dan signifikan terhadap prestasi siswa dan dapat diintegrasikan ke dalam praktik pendidikan untuk mendorong pembelajaran yang lebih inovatif dan praktis di era digital.

***Kata kunci*:**
Artificial Intelligence (AI); Prestasi Belajar; Pendidikan Kewarganegaraan; Inovasi Pembelajaran.

1. Introduction

Technological advancements, especially in artificial intelligence (AI), have brought significant transformations to the world of Education. AI offers a range of innovative solutions that can improve the quality of learning, from personalizing materials to developing interactive teaching methods. The integration of AI in Education accelerates adaptation to the needs of the digital era and opens up new opportunities to create more effective, inclusive, and engaging learning experiences. Technology education is essential in the modern era, where technological advances, especially computers, significantly impact learning. Computers are used to support the teaching and learning process effectively, so the integration of creative technological tools is needed to meet the needs of teachers and students (Chang et al., 2022; Fidan & Tuncel, 2019; V. R. Lee, Pope, Miles, & Zárate, 2024; Rokhayani, Rukmini, Hartono, & Mujiyanto, 2022).

Artificial intelligence (AI) has become one of the most significant technological advancements in the rapidly evolving digital age. Xiang claims that artificial intelligence is one of the hottest subjects in social progress right now and that it is essential for students to study. (Xiang, 2023). Supercomputers, computers with extraordinary processing power and the capacity to adjust to a wide range of sensors and other behaviors, are comparable to artificial intelligence. This feature enhances communication between supercomputers and humans by enabling them to have cognitive and functional capacities similar to those of humans (Y. Lee et al., 2024).

Artificial intelligence (AI) is changing Education worldwide. AI has the potential to revolutionize higher Education in many ways, so students must learn how to use AI-based algorithms. Successful integration of AI into Higher Education requires careful planning and ethical considerations. AI offers a great deal of promise in increasing student learning accomplishment in the higher education setting. Examples of applications and cutting-edge technologies include learning analytics, adaptive learning systems, intelligent tutors, and other tools that assist and improve the educational experience for students. (Ouyang & Jiao, 2021; Rios-Campos et al., 2023; Zentner, 2023).

It has been demonstrated that artificial intelligence in Education (AIEd) helps teachers learn m.ore and better about how their pupils perform on online platforms (Kamalov, Santandreu Calonge, & Gurrib, 2023; Ouyang & Jiao, 2021; Rios-Campos et al., 2023; Zentner, 2023). Artificial Intelligence has a broad application in Education. AI includes giving teachers AI teaching assistants, giving each student individualized support, and assigning students to tutors specializing in each area. Furthermore, AI can analyze a vast quantity of data on every student, including their preferences, skills, weaknesses, and learning styles. (Mouta, Torrecilla-Sánchez, & Pinto-Llorente, 2023; Rahiman & Kodikal, 2024).

Artificial intelligence is increasingly being employed in Education, and its uses are becoming more diverse than just supercomputers. Examples of these applications include embedded computer systems (Chen, Chen, & Lin, 2020). AI use in Education includes intelligent tutoring systems, teaching robots, learning analytics dashboards, adaptive learning systems, and human-computer interaction (Ouyang & Jiao, 2021; Rios-Campos et al., 2023).

The AI industry has been captivated by OpenAI's ChatGPT, which is a tribute to the field's ongoing progress, especially in NLP and deep learning (Hallal, Hamdan, & Tlais, 2023a). ChatGPT provides customized and user-friendly assistance, allowing students to ask questions, get answers, and get advice on academic topics. Tailored support can boost students' confidence and self-esteem by fostering an innate sense of competence and motivation to overcome educational challenges (Hallal, Hamdan, & Tlais, 2023b; Hsu & Silalahi, 2024; Niloy et al., 2024; Youssef, Medhat, Abdellatif, & Al Malek, 2024).

As ChatGPT meets students' need for social connection and a sense of belonging in the classroom, it may boost their motivation to participate in class activities by providing them with a sense of community and support (Einarsson, Lund, & Jónsdóttir, 2024) (Alneyadi & Wardat, 2023; Essel, Vlachopoulos, Essuman, & Amankwa, 2024; Habibah, 2024; Hsu & Silalahi, 2024; Zentner, 2023).

Artificial intelligence (AI) products like Quillbot, Perplexity, Humata AI, and ChatGPT can impair critical thinking and intellectual capacity. They agree that AI, ChatGPT in particular, can inspire original thought. Perplexity and ChatGPT provide forums for delving deeper into solutions. In contrast, Quillbot is a helpful tool for rewriting sentences or words to prevent plagiarism, and Humata AI helps students study academic articles accurately and effectively (Habibah, 2024). (Habibah, 2024; Kamalov et al., 2023; Zirar, 2023).

The research conducted by Carpio Canada et al. implies successfully integrating the Google AI Challenge into the curriculum without sacrificing learning objectives. This can support the adoption of new teaching strategies by educators and learners, increasing course appeal and improving student achievement (Chen et al., 2020; Velander, Taiye, Otero, & Milrad, 2024; Xiang, 2023; Yau et al., 2023).

This research focuses on how AI can improve student learning achievement in college. AI enables more personalized and practical solutions to address increasingly complex educational challenges, such as differences in students' abilities and learning needs. AI-based learning systems can also provide real-time feedback and help students learn better.

Since traditional Education frequently fails to give each student adequate support and attention, solving this issue is essential. In addition, AI is becoming increasingly crucial to ensuring that every

student may realize their full academic potential as the number of students and their diverse needs rise. This study addresses the fundamental questions of what AI applications students frequently employ in learning and how much AI can influence student learning achievement.

Integrating technology in Education, including AI, can accelerate the transformation of learning towards a more personalized and adaptive experience. In significant literature analysis, AI has been shown to improve student engagement, provide faster and more accurate feedback, and help students better manage their learning load. In line with this, AI also plays an essential role in improving teachers' readiness and intention to adopt new technologies. A strategic approach is needed to develop AI-based Education, accelerate global integration, and strengthen teachers' competencies in effectively teaching ever-evolving technologies. The combination of student engagement and teacher readiness will drive more innovative and relevant Education in the digital age (Sanusi, Ayanwale, & Chiu, 2024).

AI has been demonstrated in numerous earlier research to impact college teaching and learning significantly. According to research by Rio-Campos et al., rules on using data and artificial intelligence (AI) in Education have now been developed. This guideline describes how AI can support the learning and completion of administrative duties in higher Education by professors and students. (Rios-Campos et al., 2023). Furthermore, Zirar's (2023) research explains that educators must use large language models, such as ChatGPT, Perplexity AI, etc., to make practical contributions. It's more futuristic to embrace and use these instruments than to push and scare (Habibah, 2024; Kamalov et al., 2023; Zirar, 2023).

This study aims to determine how much the application of artificial intelligence (AI) in ChatGPT, Bard, and Perplexity in learning in the campus environment can be implemented effectively and how it affects student learning achievement. This study also aims to evaluate the extent to which the use of AI can improve student learning achievement, both in terms of material comprehension, analytical skills, and critical thinking skills, as well as to identify factors that affect the successful application of AI technology in learning at the higher education level.

2. Methods

2.1. Research Design

This study uses a quantitative method with a survey approach to analyze the relationship and influence between independent variables, namely Artificial Intelligence (AI), and dependent variables, namely student learning achievement. This approach allows researchers to obtain measurable data and conduct objective analysis following the research objectives. AI-based learning supports personalization through adaptive algorithms that can identify students' individual needs, thereby increasing the effectiveness and efficiency of the learning process (Fahimirad & Kotamjani, 2018; Joshi et al., 2024).

2.2 Population and Sample

The research by Shaheen et al. emphasizes the importance of sample representation in technology-based studies to ensure generalizable results in the broader population (Shaheen, Pradhan,

& Ranajee, 2018). They recommend the use of *random sampling* techniques to minimize bias. In this study, the selected population is all students of the Pancasila and Citizenship Study Program at STKIP Pasundan Cimahi. The sampling technique uses the *random sampling method* so that the data obtained can represent the population as a whole. With the application of this technique, the study's results are expected to provide an accurate picture of the actual condition of PPKn students in the context of using AI.

2.3 Research Instruments

Laupichler emphasized the importance of the validity and reliability of research instruments in measuring variables related to artificial intelligence (AI). They recommend using a Likert scale-based questionnaire that has been tested for validity (Kember & Leung, 2008; Laupichler, Aster, Perschewski, & Schleiss, 2023). This study uses electronic questionnaires as the main instrument to measure three aspects: the level of AI use in learning, students' perception of AI effectiveness, and student learning achievement data taken from academic assessments. This instrument is designed based on a literature review to ensure its relevance and validity. For data analysis, a Likert scale of 1-5 was applied to evaluate the level of agreement of respondents to various statements submitted in the questionnaire.

2.4 Data Collecting

The effectiveness of electronic questionnaires as a tool to collect data quickly, especially in the digital era. They also underlined the importance of ensuring the security of respondents' data during the collection process (Alneyadi & Wardat, 2023). In this study, data collection was carried out by distributing electronic questionnaires to predetermined samples. The questionnaire was designed to measure students' perception of the influence of AI in learning on their academic achievement. The collected data is then processed into quantitative data for further analysis.

2.5 Data Analysis

According to Kumar, multiple linear regression is an ideal analysis method to assess the statistical influence of independent variables on dependent variables. This technique allows researchers to identify significant relationships between the various factors involved in the study. This study analyzed the collected data using multiple linear regression to measure how much AI affects student learning achievement (Kumar et al., 2021). The analysis was carried out to evaluate the relationship between independent and dependent variables and determine the contribution of AI to improving learning achievement through the value of the determination coefficient (R^2). For the analysis results to be accurate and trustworthy, statistical software such as SPSS or R is used, as (Kumar et al., 2021) suggested, to handle big data derived from technology-based surveys.

3. Results and Discussion

Based on the data analysis and observations, the research respondents were active students of the PPKn Study Program of STKIP Pasundan. The number of active students in the class of 2020 is 34 people, the class of 2021 is 33 people, the class of 2022 is 40 people, and the class of 2023 is 50

people, so the total active student population of PPKn reaches 157 people. Of these, the sample used in this study was 61 students, consisting of 13 people from the class of 2020, 13 people from the class of 2021, 15 people from the class of 2022, and 20 people from the class of 2023.

The study divided 61 respondents into two groups, male and female, respectively. Group organizing helps identify patterns or differences in AI usage and learning performance among groups. As seen in the following Table 1:

Table 1. Gender of Respondents

Gender					
		Frequency	***Per cent***	***Valid Percent***	***Cumulative Percent***
Valid	Male	20	32,8	32,8	32,8
	Pemale	41	67,2	67,2	100,0
Total		61	100,0	100,	

The gender breakdown of the 61 responders is displayed in Table 1. Twenty respondents, or 32.8% of the total, were male (M), and 41 respondents, or 67.2%, were female (F). When accounting for female respondents, the cumulative proportion reveals that the total comes to 100.0%. This suggests that women comprise more than twice as many respondents as men and comprise the bulk of study participants.

Twenty males and forty females made up the respondents' gender composition, according to the data processing results. Eleven respondents used Bard/Gemini AI, 38 used ChatGPT, and 12 used Perplexity as their artificial intelligence tool. As seen in the following Table 2:

Table 2. Platform Artificial Intelligence

Artificial Intelligence					
		Frequency	***Per cent***	***Valid Percent***	***Cumulative Percent***
Valid	Bard / Gemini AI	11	18,0	18,0	18,0
	ChatGPT	38	62,3	62,3	80,3
	Perplexity	12	19,7	19,7	100,0
	Total	61	100,0	100,0	

The above table indicates that out of the 61 respondents, most use ChatGPT as an artificial intelligence (AI) tool, with 38 users, or 62.3% of the total, using the app. Only 12 respondents (19.7%) used Perplexity, whereas 11 (18.0%) used Bard/Gemini AI. The cumulative rate indicates that after blocking users of Bard/Gemini AI, the cumulative rate is 18.0%. This rate increases to 80.3% when users of ChatGPT are blocked and reaches 100.0% when users of Perplexity are blocked. This Data indicates that ChatGPT is the AI that responders use the most, followed by Perplexity and Bard/Gemini AI.

Data was collected from respondents, and this study investigated the variables of artificial intelligence technology (X) and learning achievement variables (Y). Each statement was evaluated to demonstrate respondents' perception of AI technology and its influence on learning achievement. Descriptive statistical testing conducted using SPSS version 26 produced data on mean, median, standard deviation, and data distribution for both variables, as seen in Table 3 below:

Table 3. Descriptive Statistics of Variables

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Standard Deviation
Artificial Intelligence	61	41,00	34,00	75,00	56,62	8,35
Prestasi Belajar	61	40,00	35,00	75,00	57,92	9,15
Valid N (listwise)	61					

Based on information from 61 participants (N = 61), this descriptive statistical table shows two variables: artificial intelligence and learning achievement. A range of values represents the lowest and most significant scores. For instance, the ranges for the AI and Learning Achievement variables are 41.00, 34.00, and 75.00, respectively, with a minimum score of 35.00 and a maximum score of 75.00 for each variable. Standard deviation was used to characterize the variation or spread of the data; the learning achievement variable had a standard deviation of 9.15, and the artificial intelligence variable had a standard deviation of 8.35, indicating that there was a slight variation in respondents' learning achievement when compared to their use of artificial intelligence.

The next step in data analysis is to perform a normality test to ascertain if the data is regularly distributed. Having properly distributed data is an absolute requirement in parametric statistics. Data normality tests are carried out as a preliminary step to ensure the data satisfies these standards. Researchers employed the Kolmogorov-Smirnov Test of Normalcy to test for normalcy. The Kolmogorov-Smirnov (KS) test is a non-parametric statistical technique determining whether data conforms to a particular probability distribution. This test helps find anomalies since it can show whether the data distribution differs significantly from the expected normal distribution, making it possible to identify possible abnormalities (Kini, Harrou, Madakyaru, & Sun, 2024).

The researcher used SPSS version 26 to perform a test for data normalcy. Probability (asymptotic significance) is used in decision-making under two conditions: the distribution and regression model are deemed normal if the likelihood is more significant than 0.05 and abnormal if the probability is less than 0.05. P-P plot average regression test results. The link between the observed and expected cumulative probability is depicted in this graphic. The dependent variable in question is learning achievement. The diagonal line represents the expected normal distribution in this picture, and the dots indicate the remaining data or deviation from the predicted regression line. Regression normality is assumed if the point is close to or follows a diagonal line, in which case the residue is distributed normally. Most points show good diagonal line following, suggesting a regularly distributed residue in the regression model. This implies that the learning achievement variable data

is assumed to meet the standard of normalcy. The Data Normality Test can be used for the subsequent testing phase. Table 4 displays the test results. The subsequent:

Table 4. Data Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		61
Normal Parameters[a,b]	Mean	0,0000
	Standard Deviation	5,8491
Most Extreme Differences	Absolute	0,056
	Positive	0,056
	Negative	-0,042
Test Statistic		0,056
Asymp. Sig. (2-tailed)		.200[c]

a. Test distribution is Normal
b. Calculated from data
c. Lilliefors Significance Correction

The outcomes of the Data Normality Test on the unstandardized residuals of the regression model using the One-Sample Kolmogorov-Smirnov Test are displayed in Table 4. The residual mean is 0.0000000, and the standard deviation is 5.84912315 for a sample count (N) of 61. In absolute numbers, there was a 0.056 difference between the observed residual distribution and the expected normal distribution, with a 0.056 positive value and a -0.042 negative value. The significant value of the two tails (Asymp. Sig.) was 0.200, while the test statistic value was 0.056. The assumption of data normalcy is satisfied since the residual distribution in the regression model resembles the normal distribution because the significance value is more extensive than 0.05.

The homogeneity test is employed to ascertain the homology of several population variations. This test was run to examine the ANOVA and independent sample t-test. The fundamental presumption of variant analysis (ANOVA) is that population variants are identical. The similarity test determines whether the data distribution is homogeneous by comparing the two variances (Sianturi, 2022).

Before comparing two or more groups, a homogeneity test of variance is required to ensure that the discrepancies do not result from variations in fundamental data or the groups being compared being heterogeneous, other formulas such as the Bartlett, Levene, Cochran, and Harley tests are available for the variance homogeneity test. (Sianturi, 2022). The following serves as the foundation or framework for decision-making in the homogeneity test: The variance of two or more data population groups is homogenous (the same) if the significance value is more significant than 0.05; if the significance value is less than 0.05, the variance of the two or more data population groups is not homogeneous (not the same).

Table 5. Homogeneity Test

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig
Learning Achievement	Based on Mean	0,278	2	58	0,758
	Based on Median	0,291	2	58	0,749
	Based on the Median and with adjusted df	0,291	2	55,544	0,749
	Based on trimmed mean	0,281	2	58	0,756

Based on information gathered from 61 respondents, Table 5 offers statistical descriptions for the Artificial Intelligence Technology variable (X) and the Learning Achievement variable (Y). The Artificial Intelligence Technology (X) variable has a mean value of 56.62 with a standard deviation of 8.35. In contrast, the Learning Achievement (Y) variable has a mean value of 57.92 with a standard deviation 9.15. With a range of 40.00 for learning achievement and 41.00 for artificial intelligence, the values for both variables indicate that the data is quite broadly distributed. The variance of the two data groups was homogeneous, according to the results of the homogeneity test performed using the Levene method, with a significance value of > 0.05 for all test methods (based on mean, median, and trimmed mean). This suggests that the variance of the two data population groups is equal, making them eligible for additional analysis using t-tests or ANOVA.

The following Table 6 displays the outcomes of the processed tests:

Table 6. Test Results t

Coefficients [a]						
		Unstandardized Coefficients		StandCoefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	10,224	5,221		1,958	0,055
	Artificial Intelligence	0,842	0,091	0,769	9,233	0,000

a. *Dependent Variable*: Learning Achievement

The findings of a basic linear regression between the variables for learning achievement (Y) and artificial intelligence technology (X) are displayed in the Coefficients table. With a t-value of 1.958, a significance value of 0.055, and an intercept of 10.224, the coefficient of the constant is nearly inside the significance limit of 0.05. With a standard error of 0.091 and a standard beta value of 0.769, the Coefficient of Artificial Intelligence Technology is valued at 0.842. With a significance level of 0.000, the t-value for AI is 9.233, suggesting a highly significant correlation between learning achievement and the use of AI technology. According to this, there is a statistically significant correlation between the usage of AI and learning outcomes, with an increase of 0.842 units for every rise in AI use.

The Fisher test (Test F) is the general hypothesis test that pits the independent variable against the dependent variable. The degree of significance of the independent variable's overall influence on the bound variable can be ascertained by applying the F test.

The test results are displayed in Table 7. below:

Table 7. Test Result F

ANOVA[a]						
	Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig*
1	*Regression*	2965,856	1	2965,856	85,245	.000[b]
	Residual	2052,734	59	34,792		
	Total	5018,590	60			

a. Dependent Variable: Learning Achievement
b. Predictors: Artificial Intelligence

The findings of the variance analysis (ANOVA) testing the significance of the regression model between the learning achievement variable (as a dependent variable) and the artificial intelligence technology variable (as a predictor) are displayed in the ANOVA table. With one degree of freedom (df), the regression's Sum of Squares value is 2965.856, while its residual value is 2052.734 with 59 df. With a significance value (Sig.) of 0.000, the F value of 85.245 shows that this regression model significantly affects the learning performance variable. This suggests that artificial intelligence technology can explain a considerable portion of the diversity in learning achievement.

To ascertain the outcomes of this regression analysis, a partial test (t-test) is necessary. The findings of the partial test were conducted to determine how the independent variable affected the bound variable in the created regression model. Therefore, it is known that the artificial intelligence technology (b/regression coefficient) value is 0.842, and the constant (a) value is 10.224. As a result, the regression equation leads to the following conclusion.

$$Y = \alpha + \beta X$$
$$Y = 10{,}224 + 0{,}842X$$

Regression analysis Y=10.224+0.842XY = 10.224 + 0.842XY=10.224+0.842X demonstrates that Artificial Intelligence Technology (X), the independent variable, positively affects Learning Achievement (Y), the dependent variable. The constant 10.22410.22410.224 indicates that learning achievement (Y) has a base value 10.224 without artificial intelligence technology utilization (X = 0). The regression coefficient of 0.8420,8420,842 indicates that 0.842 units will be added to learning achievement for every increased unit using artificial intelligence technology. This equation shows that learning achievement can be predicted to grow with the application of AI technology.

3.1 Use of Artificial Intelligence in Learning

In general, technology makes all human labor or tasks easier. Artificial intelligence (AI) that uses text mining techniques and natural language processing (NLP) to provide answers to all questions has advanced quickly over the last two years. This aligns with the research findings, which

indicate that natural language processing (NLP) is one of the facets of AI that has drawn much interest from academic researchers. Natural language processing (NLP) studies how computers can comprehend and generate language similar to that of humans. It is a field of study with many subfields. ChatGPT, an OpenAI-developed version of the GPT (Generative Pre-trained Transformer) language model, illustrates how far NLP has come (Alshater, 2023; Peek, Combi, Marin, & Bellazzi, 2015).

AI can significantly increase the efficacy and efficiency of research since it can develop scenarios and simulations, analyze and interpret massive volumes of data, and explain findings succinctly.

The study results showed that Pancasila and Citizenship Education Students at STKIP Pasundan generally used artificial intelligence, with the ChatGPT platform at 62.3%, Bard/Gemini AI at 18%, and Perplexity at 19.7%. This indicates that the artificial intelligence variable (X) produces a classification that is considered "Very Good." The data shows that ChatGPT is the respondents most widely used AI, followed by Perplexity and Bard/Gemini.

3.2 Student Learning Achievement

In this study, learning achievement refers to the evaluation of students' progress and understanding in learning Pancasila and Citizenship Education after the use of artificial intelligence (AI). Student learning achievement reflects all individual achievements and measures the education system's success. This has been proven to improve student learning achievement, especially at STKIP Pasundan. Therefore, AI can help improve student learning achievement.

Learning achievement is the end of the learning process, and learning motivation affects the outcome. Therefore, learning must be designed to test knowledge, shape character, and equip students with relevant skills to face real-world challenges.

This attitude includes the tendency of students to behave following the values taught. These values include democratic principles, tolerance, respect for human rights, justice, unity, and other moral values. The expected learning achievement is students who have an attitude of respecting differences, respecting human rights, being responsible in community life, and being aware of the importance of active involvement in the democratic process.

Utilizing artificial intelligence and learning motivation of every student significantly affects learning achievement. The results showed that the explanation for each question asked to the 61 students surveyed was in a suitable category. This is demonstrated by the calculation of the statistical description of student learning achievement, which obtained a score of 57.92%, which shows that the student learning achievement variable (Y) results in a category categorized as "Very Good," with five answer options for each of the fifteen question items surveyed by the Y variable.

3.3 The Influence of Artificial Intelligence on Student Learning Achievement

Even if they may counter what lecturers anticipate from their students, the numerous roles that artificial intelligence (AI) plays help students achieve academic success by improving their learning results. Achieving graduation rates, improving grades, gaining recognition and rewards from instructors, and implementing knowledge are a few instances of this academic achievement. As a

result, the learning environment is more adaptable and suited to the particular requirements of every student. As a result, *AI* enhances Education's efficacy and accessibility.

By using artificial intelligence technology wisely, Education can undergo a significant transformation, increase student engagement, reduce gaps in learning, and create learning experiences tailored to the needs of the future. Various things can be used to apply *Artificial Intelligence* technology in activities to improve student learning achievement.

The findings of the questionnaires that the participants in this study completed yielded a table t = 1.671 with a computed t value of 9.233 and a significant value of 0.000 with df = (n-2) = (61-2) = 59 and using a significance level = 0.05 or 5%. The comparison findings show that $t_{calculation} = 9.233 > t_{table} = 1.671$ and 0.000 < 0.05 is the significance level and value. This indicates that H0 is rejected and H1 is accepted based on the comparison. Consequently, learning achievement (the bound variable) is impacted by artificial intelligence (the independent variable). Artificial intelligence technology has a 59.1% influence on learning outcomes; the remaining 40.9% is determined by factors not included in this study.

4. Conclusion

The results of the study show that the use of artificial intelligence (AI) in learning has a positive influence on the achievement of student learning outcomes. This can be seen from the significant relationship between the independent variable of AI and the dependent variable of learning achievement, which reflects the contribution of technology in improving the quality of the educational process. These findings emphasize the importance of integrating AI in learning to encourage a more interactive, adaptive, and relevant learning experience that fits students' needs.

In addition to improving learning achievement, AI also plays a role in encouraging learning motivation, increasing material absorption, and presenting innovations in the learning process. The integration of AI in Education accelerates adaptation to the needs of the digital era and opens up opportunities to create more interactive, inclusive, and practical learning experiences. Thus, artificial intelligence has great potential to be widely integrated into learning to support the creation of more innovative Education.

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