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THE EFFECT OF USING CHATGPT ARTIFICIAL INTELLIGENCE (AI) AND DIGITAL LITERACY ON STUDENT LEARNING OUTCOMES IN GRADE XI CIVICS

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ABSTRAK

Pendidikan Kewarganegaraan mengajarkan tentang oposisi politik, demokrasi, dan nilai-nilai luhur bangsa Indonesia yang telah ada sejak kemerdekaan. Pendidikan Kewarganegaraan diberikan agar warga negara dapat mengembangkan diri menjadi warga negara yang baik. Tujuan penelitian ini adalah untuk menentukan pengaruh penggunaan Kecerdasan Buatan (AI) ChatGPT dan literasi digital terhadap hasil belajar siswa dalam mata pelajaran Pendidikan Kewarganegaraan di kelas XI SMA Negeri 5 Pematangsiantar pada tahun ajaran 2025/2026. Jenis penelitian yang digunakan dalam penelitian ini adalah penelitian kuantitatif. Berdasarkan hasil penelitian yang dijelaskan di atas pada bab IV, dapat ditarik kesimpulan sebagai berikut: Pengaruh metode teknologi Kecerdasan Buatan (AI) ChatGPT terhadap hasil belajar siswa pada mata pelajaran Pendidikan Kewarganegaraan di kelas XI SMA Negeri 5 Pematangsiantar pada tahun ajaran 2024/2025 adalah "sangat kuat" (1.04). Pengaruh literasi digital siswa terhadap hasil belajar siswa pada mata pelajaran Kewarganegaraan di kelas XI SMA Negeri 5 Pematangsiantar pada tahun ajaran 2024/2025 adalah "sangat kuat" (1.04). 2024/2025 "kuat" (1.01) Pengaruh Metode Teknologi Kecerdasan Buatan (AI) ChatGPT dan Literasi Digital terhadap Hasil Belajar Siswa pada Mata Pelajaran Pendidikan Kewarganegaraan untuk Kelas XI di SMA Negeri 5 Pematangsiantar pada tahun ajaran 2024/2025 adalah "kuat" (1.09).

Keywords:
Artificial Intelligence (Ai), Chatgpt, Digital Literacy, Student Learning Outcomes

ABSTRACT

Civics Education teaches political opposition, democracy, and the noble values of the Indonesian nation that have existed since independence. Civics Education is provided so that citizens are able to develop themselves into good citizens. The purpose of this study is to determine the effect of the use of Artificial Intelligence (Ai) Chatgpt and digital literacy on student learning outcomes in the subject of Civics in class XI of SMA Negeri 5 Pematangsiantar in the academic year 2025/2026. The type of research used in this study is quantitative research. Based on the results of the research described above in chapter IV, the following conclusions can be drawn: The effect of the Artificial Intelligence (AI) ChatGPT technology method on student learning outcomes in the subject of Civics in class XI at SMA Negeri 5 Pematangsiantar in the academic year 2024/2025 is "very strong" (1.04). The effect of students' digital literacy on student learning

outcomes in the subject of Civics in class XI at SMA Negeri 5 Pematangsiantar in the academic year 2024/2025 is "very strong" (1.04). 2024/2025 "strong" (1.01) The influence of the ChatGPT Artificial Intelligence (AI) Technology Method and Digital Literacy on Student Learning Outcomes in the Civics Subject for Grade XI at SMA Negeri 5 Pematangsiantar in the 2024/2025 academic year is "strong" (1.09).

1. Introduction

Education is an effort to realize learning activities carried out so that students can actively learn and develop their potential to be better in terms of intelligence, knowledge, personality, intelligence, noble morals and skills needed by themselves and society. In a simple and general sense, the meaning of education is a human effort to grow and develop innate potential both physical and spiritual in accordance with the values that exist in society and culture (Williams et al., 2019).

National education is education implemented based on Pancasila and the 1945 Constitution of the Republic of Indonesia (UUD 1945), which plays a strategic role as the primary foundation for national development. It is based on the principles of Godhead, Indonesian culture, and responsiveness to changing times. Furthermore, to improve the quality of human resources (HR), education and support from the community and government are essential for the implementation of education itself. (Nosratabadi et al., 2022). The function of national education as stated in Article 3 of Law Number 20 of 2003 (the National Education System Law) concerning the National Education System in Indonesia, states: "National Education functions to develop abilities and shape the character and civilization of a dignified nation in order to enlighten the life of the nation, aiming to develop the potential of students to become human beings who believe in and are devout to God Almighty, have noble morals, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens" (Law, 2024a).

Education plays a key role in shaping the next generation of the Indonesian nation to grow and develop into individuals with strong personalities. With strong character, the younger generation is expected to contribute to national development (Law, 2024b) . As part of the goal of education, it is hoped that human resources (HR) will be created that are not only academically superior but also possess integrity, resilience, and a commitment to national progress (Hidayati et al., 2024). Through quality education, Indonesia's younger generation can play an active role in realizing sustainable national development. In today's digital era, technology has become an integral part of the learning process. Various innovations, such as e-learning platforms, educational software, and artificial intelligence, make it easier for students to access learning materials in a more interactive and flexible manner. With technology, students can learn

anytime and anywhere, and obtain information more quickly and in-depth (Zhao et al., 2025).

Furthermore, technology also enables more adaptive learning methods, such as the use of instructional videos, interactive simulations, and computer-based testing that help students understand concepts more effectively. With technological support, it is hoped that students' learning motivation will increase, thus positively impacting their learning outcomes. However, the effectiveness of technology in learning also depends on other factors, such as students' digital skills, the role of teachers in guiding them, and the availability of adequate internet access and devices. Therefore, appropriate strategies are needed so that technology truly provides maximum benefits for improving student learning outcomes (Nurhayati & Erviana, 2025).

In today's modern era, technological advances have had a significant impact on the education sector. One prominent innovation is the use of artificial intelligence-based applications, such as ChatGPT, in the teaching and learning process. This application provides opportunities for students to access information, get help completing assignments, and interact with learning materials in a more interactive way. Many educators are starting to adopt this technology and allow their students to use ChatGPT as a learning tool. This shows that teachers recognize the potential of technology to improve student understanding and support a more effective learning process. Thus, the application of technology in education not only enriches the learning experience but also prepares students to face the challenges of an increasingly digital world (Haristiani, 2019).

Civics Education is an education that instills a democratic attitude, awareness of the rights and obligations of citizens, and upholds human rights values, which are then reflected in the form of habits of action, thus realizing a civil society. Civics Education teaches political opposition, democracy, and the noble values of the Indonesian nation that have existed since independence. Civics Education is provided so that citizens are able to develop themselves into good citizens. Civics Education is expected to develop critical thinking skills, enrich national insight, and increase love of the homeland and nationalism (Anggraeni & Meilina, 2024).

Schools can be defined as formal educational institutions that serve as a place to teach knowledge, skills, and values to individuals. Through schools, individuals can obtain formal education regulated by a curriculum set by the government. To improve optimal learning, the government develops a curriculum to improve the quality of education. Law No. 20 of 2003 Chapter 1 Article 1 states that "the curriculum is a set of plans and arrangements regarding the objectives, content, and learning materials as well as the methods used as guidelines for organizing learning activities to achieve certain goals." The implementation of the curriculum in Indonesia has undergone various changes and improvements, including the 2013 Curriculum, which in 2018 became the revised 2013 Curriculum, and when Indonesia was affected by the pandemic storm, it changed to an emergency curriculum and was then refined to the Independent Learning Curriculum (Sahrul et al., 2024).

The increasingly rapid dynamics of change are a major obstacle, given that these challenges require continuous adaptation and innovation in the education system. In this context, understanding and utilizing technology in education is crucial to improving the quality of learning and preparing students to face future challenges. The use of technology in education not only expands access to information but also enables a more interactive, flexible, and personalized learning process. Through e-learning platforms, educational applications, learning videos, and devices such as digital whiteboards and artificial intelligence, teachers and students can collaborate virtually, access materials anywhere and anytime, and tailor learning to individual needs. Thus, the integration of technology in education is key to creating an education system that is adaptive, innovative, and relevant to the increasingly rapid dynamics of the times. Today, the most frequently used technology in the learning process is AI and digital literacy (Hakeu & Djahuno, 2024).

Artificial Intelligence (AI) technology, also known as artificial intelligence, focuses on the ability of machines to imitate or understand human behavior, requests, and interests in the fast-paced information sector. Artificial Intelligence (AI) enables computerized machines to process information and data to provide computer-based search results quickly and concisely. Technological developments in the innovative world of education have transformed interactive teaching and learning methods into a realm of rapid creativity by using Artificial Intelligence (AI), which allows users to conduct conversations by asking questions to answer school assignments. Students in schools must have the ability and skills to access data and analyze information to adapt to the speed of information, which is always a problem in student digital literacy. Meanwhile, digital literacy is the knowledge and skills of information users in utilizing digital media, such as communication tools and internet networks. Skills in digital literacy include the ability to find, work on, evaluate, use, and utilize it wisely, intelligently, carefully, and appropriately according to its purpose (Tejawiani et al., 2023) . Artificial Intelligence (AI) technology and digital literacy are closely linked in the context of technological developments to assist students in obtaining information for learning. However, many students still lack the ability and skills to access and analyze existing data (Ramaul et al., 2024). As a result, many students are easily influenced by inaccurate information or hoaxes due to a lack of ability to access and analyze data critically (Ratten & Jones, 2023) . This results in difficulties in selecting valid and relevant information for their learning. Therefore, it is important for students to improve their digital literacy so they can use technology, including Artificial Intelligence (AI), wisely and effectively in the learning process (Kavitha et al., 2024) . Related to the explanation above, by using AI technology, students can find answers to problems more quickly than searching for information in books. On the one hand, AI simplifies the process of finding answers to problems quickly, so students tend to rely on this technology (Moongela et al., 2025).

Based on the description above, the researcher is interested in seeing "The Effect of Using Artificial Intelligence (AI) ChatGPT Technology and Digital Literacy on Student Learning Outcomes in Civics Subjects for Class XI of SMA Negeri 5 Pematangsiantar".

2. Method

A research method is essentially a scientific method for obtaining data for a specific purpose and purpose. A research method is a method or technique used systematically to examine an object or research object, and as an effort to find data whose truth still needs to be scientifically validated, including its validity. Research is a systematic investigation aimed at providing information to solve problems. In this study, the method used was a survey. According to Harnanto (Zendrato, 2024), states that the survey method is a method that explains a large population by using a sample method to find out the behavior and characteristics and make descriptions of what is in the population.

According to Sugiyono (Saputra et al., 2024) states that the survey method is a quantitative method that can be used to obtain data that occurs both in the past and the present, regarding beliefs, opinions, characteristics, behavior in variable relationships, as well as to test several hypotheses about sociological and psychological variables from samples that have been taken from certain populations and the method of data collection is by interview or questionnaire techniques but not in depth and the results tend to be used for generation.

Based on the opinions of the two experts above, it can be concluded that the survey method is a quantitative approach that aims to gather information about the characteristics, behavior, beliefs, and views of a specific population. This method uses a sample as a view of a specific population, this method also uses samples as a representation of a larger population, and the techniques used to collect data are interviews and questionnaires.

To help facilitate obtaining useful information in terms of collecting the data needed during the research. Then the location of the school research that became the research location is: Furthermore, according to Azhari, et al (Setia Nugraha, 2023) said that the population is the entire unit being studied. Based on the two experts above, the population is a collection of individuals with predetermined quality characteristics. The population in this study were students of class XI of SMA Negeri 5 Pematangsiantar, where there are 10 class XI with a total of 355 people.

A sample is a portion of a population being studied. A sample is considered representative of the population, and its results represent the observed phenomena as a whole. The researcher's goal in sampling is to obtain information about an object by observing only a portion of the population.

According to Arikunto (Lestari et al., 2025) states that if the population is less than 100 people, then the number of samples is taken as a whole but if the population is greater than 100 people, then 10-15% or 20-25% of the population is taken. Based on the expert opinion above, and in connection with the wide area of observation, the researcher determined the sample using purposive random sampling, namely 25% of the population or 25% x 355 people = 89 people. Sampling was carried out randomly with the assumption that the selected sample could achieve the objectives (CF Djarwo et al., 2025) .

3. Result and Discussion

From the results of the questionnaire trial for 32 students, the scores for the ChatGPT Artificial Intelligence (AI) technology method (sorted) were obtained as follows:

Xi

X2 = 65, 65, 67, 68, 69, 69, 70, 71, 72, 73, 73, 74, 75, 75, 76, 77

Based on the scores above, it turns out that the highest score for the high group is 90 and the highest score for the low group is 77. So, to calculate the validity test of the questionnaire, first we look for the average variance and standard deviation.

Testing criteria: accept Ho if thitung > t1 – 1/2 and in other cases rejected. Testing the calculation results obtained a value of thitung = 6.41 while from the distribution ttable for = 0.05 and dk = 16 + 16 – 2 = 30 obtained ttable = 2.085. Thus thitung is greater than ttable (6.14 > 2.085). This means that the null hypothesis is rejected so it can be concluded that there is a real difference between the scores of the high group and the scores of the low group so that the questionnaire is said to be valid.

Validity Test of Digital Literacy Questionnaire (X2)

From the results of the questionnaire trial for 32 students, the Learning Interest scores (sorted) were obtained as follows:

Xi

X2 = 64, 66, 67, 68, 69, 69, 69, 70, 71, 71, 72, 73, 74, 74, 75, 76

Based on the scores above, it turns out that the highest score in the high group is

89 and the highest score from the low group is 76. So to calculate the validity test of the questionnaire, first find the average variance and standard deviation.

Testing criteria: accept Ho if thitung > t1 – 1/2 and in other cases rejected. Testing the calculation results obtained a value of thitung = 7.26 while from the distribution ttable for = 0.05 and dk = 16 + 16 - 2 = 30 obtained ttable = 2.085. Thus thitung is greater than ttable (7.26 > 2.085). This means that the null hypothesis is rejected so that it can be concluded that there is a real difference between the high group score and the low group score so that the questionnaire is said to be valid From the list of expected and observed frequencies obtained smaller than the chi square table (7.309 < 9.488) so that the questionnaire data for giving assignments is normally distributed (Pangesti, 2018) .

Hypothesis Testing

Simple Linear Regression Test

To determine whether there is an influence of the ChatGPT Artificial Intelligence (AI) Technology Method and Students' Digital Literacy on students' learning achievement in the Civics subject in class XI of SMA Negeri 5 Pematang Siantar, a simple linear regression test was conducted as follows:

Linear Regression of ChatGPT Artificial Intelligence (AI) Technology Method on Student Learning Outcomes

The influence of the ChatGPT Artificial Intelligence (AI) Technology method on student learning achievement is written with the equation Y = a + bx1 where a and b. From the results of the calculation of a and b, the regression equation can be written as

follows: Y = 15.67 + 18.65 X1 To see the significance of the regression, the hypothesis can be tested with Analysis of Variance (ANOVA) (Buchori, 2018) .

From the F distribution list with = 0.05 numerator degree 2 and denominator degree 60 then F0.95: 1 VS 62 = 4.28. It turns out that F count is greater than F table (8.2> 4.28). Thus Ho is rejected and H1 is accepted, this means that there is an influence of the *ChatGPT Artificial Intelligence (AI) Technology Method* on the learning achievement of class XI students of SMA Negeri 5 Pematangsiantar.

Linear Regression of Digital Literacy on Student Learning Outcomes

The influence of the Digital Literacy Technology method on student learning achievement is written with the equation Y = a + bx1 where a and b

From the F distribution list with = 0.05 numerator degree 2 and denominator degree 60 then F0.95: 1 VS 62 = 4.28. It turns out that F count is greater than F table (7.6> 4.28). Thus Ho is rejected and H1 is accepted, this means that there is an influence of the digital literacy technology method on the learning outcomes of class XI students of SMA Negeri 5 Pematangsiantar (Herlina et al., 2022) .

Simple Linear Regression Linearity Test

To prove whether the linear regression model hypothesis is accepted or rejected, a regression linearity test is necessary. If the linear equation is rejected, then a linear prediction model is used. If the equation is not linear, a nonlinear model must be used (Hasliyah et al., 2022) . The regression linearity test is performed by comparing the calculated F with the F table, which is calculated using the following formula:

F = *S TC*

S 2 ——

With testing criteria:

If the calculated F value is smaller than Ftable at the significance level of 1 - with numerator dk k - 2 and denominator dk n - k then the non-linear hypothesis of Y over X can be accepted and vice versa Accept the linear regression model hypothesis if the calculated F value is greater than Ftable. From the calculation results obtained Fcount = 2.34 and the Ftable value at the significance level = 0.05 with numerator dk 7 and denominator dk 35 obtained F0.95 = 2.29. In accordance with the testing criteria, it turns out that the calculated F value is greater than Ftable (2.34>2.29) then the hypothesis of the linear regression model of Y over X1 can be accepted.

Accept the hypothesis of the linear regression model if the calculated F is greater than the Ftable. From the calculation results, the calculated F = 2.35 and the Ftable value at the real level = 0.05 with a numerator dk of 7 and a denominator dk of 35, obtained F0.95 = 2.29. In accordance with the testing criteria, it turns out that the calculated F is greater than the Ftable (2.35>2.29), so the hypothesis of the linear regression model Y on X2 can be accepted.

Multiple Linearity Test

To test whether each coefficient can provide a description of Y for changes in X related to the coefficient in question, it is necessary to carry out multiple linear regression calculations. Testing the coefficients with the assumption that the regression

has been accepted is in the form of multiple linear regression which is expressed by the equation Y = ao +a1 X1 + a2 X

Multiple Regression Linearity Test

To test whether the coefficient of multiple linear regression is real or not in making predictions against Y, a multiple linearity test is carried out. Test criteria: If F count is greater than F table, it can be stated that Y on X1 and Y on X2 has multiple linear regression that can be used to predict the average of Y if X1 and X2 are known. From the F distribution table with a significance level of = 0.05 with a numerator of 9 and a denominator of 62, 2.17 is obtained. It turns out that F count is greater than F table, namely (6.23 > 2.17). Thus, it can be concluded that the multiple linear regression test of Y on X1 and X2 is real (Sabani et al., 2024) .

Correlation in Simple Linear Regression

To see whether there is a significant influence between the Demonstration Learning Method and Student Learning Interest on student learning achievement, a simple linear regression significance test is carried out with the following formula: If the correlation coefficient is greater than the product moment correlation coefficient for = 0.05 and n = 64, it can be concluded that there is a significant influence. From the results of the calculation of the calculated correlation coefficient, r = 0.41 is obtained, while the correlation coefficient from the critical price of r product moment for = 0.05 and n = 64 is obtained as 0.2423 so that the calculated correlation coefficient is greater than the table correlation coefficient (1.87> 0.2423), so it can be concluded that there is a significant influence (Irhandayaningsih, 2020) .

Correlation Between Digital Literacy Methods (X2) and Student Learning Outcomes (Y)

From the calculation results, the value of ry2 = 1.01, it can be concluded that the influence between digital literacy and student learning outcomes is strong. Testing criteria:

If the correlation coefficient is greater than the product moment correlation coefficient for = 0.05 and n = 64 then it can be concluded that there is a significant influence. From the results of the calculation of the calculated correlation coefficient, r = 0.41 is obtained while the correlation coefficient from the critical price of r product moment for = 0.05 and n = 64 is obtained 0.2423 so that the calculated correlation coefficient r is greater than the table correlation coefficient (1.01 > 0.2423), then it can be concluded that there is a significant influence (Irfana & Prajawinant, 2024) .

Correlation Between Artificial Intelligence (AI) Technology Methods ChatGPT

From the calculation results above, the value of rx1x2 = 1.09 so it can be concluded that the influence of the demonstration learning method on students' learning interest is very strong.

If the correlation coefficient is greater than the product moment correlation coefficient for = 0.05 and n = 64 then it can be concluded that there is a significant influence. From the calculation results of the calculated correlation coefficient, r = 0.51 is obtained while the correlation coefficient from the critical price of r product moment for = 0.05 and n = 64 is obtained 0.2423 so that the calculated correlation coefficient r is

greater than the table correlation coefficient (1.09> 0.2423), then it can be concluded that there is a significant influence. The correlation coefficient of multiple influences is expressed by r with the following formula:

R1,2 = (1.42)2+(1.01)2−2(1.42)(1.01)(1.09)

= √ 1− (1.09)2= 12.74

From the results above, the value of Ry12 = 12.74 was obtained, so it can be concluded that the influence between the Artificial Intelligence (AI) ChatGPT technology method and Digital Literacy on student learning outcomes is strong.

Testing criteria:

If the correlation coefficient is greater than the product moment correlation coefficient for = 0.05 and n = 64, then it can be concluded that there is a significant influence. From the results of the calculation of the calculated correlation coefficient, r = 0.52 is obtained while the correlation coefficient from the critical price of r product moment for = 0.05 and n = 64 is obtained 0.2423, so the calculated correlation coefficient is greater than the table correlation coefficient (12.74 > 0.2423), then it can be concluded that there is a significant influence. To test the hypothesis "The Effect of ChatGPT Artificial Intelligence (AI) Technology Method and Digitalization Literacy on Student Learning Outcomes in Civics Subjects for Class XI at SMA Negeri 5 Pematangsiantar (Silalahi E. Dumaris, Handayani Aprilya Eka, Munthe Bangun, Simanjuntak M. Melvin, Wahyuni Sri, Mahmud Ramlan, Jamaludin, Laela Alfi Nur, Sari Maya Merris Dina, Hakim Rahman Arif, 2022) .

From the distribution list f with = ☐☐☐☐ and dk 8 denominator 61, Ftable is obtained.

= 21.23. It turns out that Fcount > from Ftable, namely (7.6>2.423), then H0 is rejected and H1 is accepted, thus there is a significant influence between the Artificial Intelligence (AI) ChatGPT Technology Method and Digital Literacy together on student learning outcomes in the subject of Civics Education for Class XI at SMA Negeri 5 Pematangsiantar, Academic Year 2024/2025

Discussion

Research Findings

Based on the data analysis that has been done, the research findings can be seen. From the description of the research data, the following data was obtained: To see whether there is an influence between the influence between the variables Y on X1 and X2, it is differentiated based on the multiple linear regression equation with the equation Y = 1.42 + 1.01X1 + 1.095X2. Meanwhile, to see the magnitude of the influence between these variables, it can be seen from the simple influence test which is stated with "R" the results of the hypothesis test are as follows (Purba et al., 2022) :

a. There is an influence between the ChatGPT Artificial Intelligence (AI) Technology Method on Student Learning Outcomes in Civics Subjects for Grade XI of SMA Negeri 5 Pematangsiantar. This means that if the learning method is good, then student learning achievement will also be good, or vice versa. The magnitude of the influence between the two variables is 1.42, which means the influence of the ChatGPT Artificial Intelligence (AI) Technology method is strong.

b. There is a significant influence between digital literacy and student learning outcomes in the subject of Civics Education for grade 11 students at Pematangsiantar State Senior High School. This means that if students have good digital literacy, their learning outcomes will also be good, or vice versa. The magnitude of the influence between the two variables is 1.01, which means that digital literacy has a strong influence on student learning outcomes.

There is a significant influence between the ChatGPT Artificial Intelligence (AI) Technology Method and Students' Digital Literacy together on Student Learning Outcomes in the Civics Subject of Grade XI at SMA Negeri 5 Pematangsiantar. The magnitude of the influence between the two variables is 1.09, which means that the influence of ChatGPT Artificial Intelligence (AI) Technology and Digital Literacy on student learning outcomes is strong

4. Conclusion

Based on the research results described above in chapter IV, the following conclusions can be drawn: the ChatGPT Artificial Intelligence (AI) Technology Method on Student Learning Outcomes in the Civics Subject for Grade XI at SMA Negeri 5 Pematangsiantar in the 2024/2025 academic year is “very strong” (1.04). The influence of students' digital literacy on student learning outcomes in the subject of Civics Education for Grade XI at SMA Negeri 5 Pematangsiantar in the 2024/2025 academic year is "strong" (1.01). The influence of the ChatGPT Artificial Intelligence (AI) Technology Method and Digital Literacy on Student Learning Outcomes in the Civics Subject for Grade XI at SMA Negeri 5 Pematangsiantar in the 2024/2025 academic year is “strong” (1.09

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