

The Effect of the Use of Artificial Intelligence by Teachers and Pupils on Pupils' Curiosity

Pengaruh Penggunaan Kecerdasan Buatan oleh Guru dan Siswa terhadap Rasa Ingin Tahu Siswa

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Abstract: Pupils' curiosity is a core character trait for learning in the digital age, yet studies of artificial intelligence (AI) in education mostly examine academic achievement rather than character. This study aimed to analyse the effect of the use of AI by teachers and pupils on pupils' curiosity. A quantitative correlational approach with a cross-sectional design was applied to 31 pupils and 27 secondary school teachers in Kerinci Regency, who completed online Likert-scale questionnaires (SPAIGP and SPAISB). The data were analysed in SPSS using descriptive statistics, classical assumption tests, and regression analysis. The results indicate that AI use has a significant positive effect on pupils' curiosity after the classical assumption tests were met. The findings suggest that AI supports exploratory learning but requires judicious guidance from teachers to avoid reliance on instant answers. Theoretically, the study extends research on AI in education from achievement to character. Practically, it highlights the central role of teachers in guiding the critical use of AI. The small sample from a single regency and the self-reported data limit the generalisability of the findings.

Keywords: Artificial Intelligence, Curiosity, Character

Abstrak: Rasa ingin tahu merupakan karakter penting dalam pembelajaran di era digital, tetapi kajian tentang kecerdasan buatan (artificial intelligence, AI) dalam pendidikan lebih banyak membahas capaian akademik daripada karakter. Penelitian ini bertujuan menganalisis pengaruh penggunaan AI oleh guru dan siswa terhadap rasa ingin tahu siswa. Pendekatan kuantitatif korelasional dengan desain potong lintang diterapkan pada 31 siswa dan 27 guru sekolah menengah di Kabupaten Kerinci yang mengisi kuesioner skala Likert secara daring (SPAIGP dan SPAISB). Data dianalisis dengan SPSS melalui statistik deskriptif, uji asumsi klasik, dan analisis regresi. Hasil penelitian menunjukkan bahwa penggunaan AI berpengaruh positif dan signifikan terhadap rasa ingin tahu siswa setelah uji asumsi klasik terpenuhi. Temuan ini mengindikasikan bahwa AI mendukung pembelajaran eksploratif, tetapi memerlukan bimbingan guru yang bijaksana agar siswa tidak bergantung pada jawaban instan. Secara teoretis, penelitian ini memperluas kajian AI dalam pendidikan dari capaian akademik ke karakter. Secara praktis, penelitian ini menegaskan peran sentral guru dalam membimbing penggunaan AI secara kritis. Sampel yang kecil dari satu kabupaten dan data yang dilaporkan sendiri oleh responden membatasi generalisasi temuan.

Kata kunci: Kecerdasan Buatan, Rasa Ingin Tahu, Karakter

Introduction

Globalisation and rapid advances in information technology have changed many aspects of life, including education. The digital age has transformed how individuals obtain information, interact, and access knowledge. In education, technological advances have influenced not only teaching methods but also learning patterns, ways of thinking, and interaction among learners. Contemporary education must therefore move beyond a sole focus on academic achievement to nurture the character and competencies of learners and prepare them for the complex global challenges of the 21st century (Voogt & Roblin, 2012).

Education is an ongoing process of developing human potential for a more meaningful life. Beyond knowledge, education shapes character, values, and personality as the foundation of social and professional life. Through education, individuals learn to understand themselves and their environment and to adapt to changing times, a view that is consistent with Dewey's (1916) idea of education as the reconstruction of experience for social and personal growth. From a legal perspective, Article 3 of Law No. 20 of 2003 (Republik Indonesia, 2003) emphasises the role of national education in developing abilities, shaping character, and fostering a dignified national culture. Its aim is to produce individuals who are faithful, of noble character, knowledgeable, creative, independent, democratic, and responsible. Education must therefore balance cognitive aspects and character building in the learning process.

Curiosity is a crucial element in education that reflects the human instinct to explore new things. In learning, it encourages pupils to seek information and ask questions actively, and it is linked to strong intrinsic motivation (Ryan & Deci, 2000). Kashdan et al. (2004) show that curiosity and exploration facilitate positive subjective experiences and opportunities for personal growth, and von Stumm et al. (2011) identify intellectual curiosity as a third pillar of academic performance. Evidence from psychology and neuroscience further shows that curiosity drives information seeking (Kidd & Hayden, 2015) and enhances learning (Gruber et al., 2014). The trait also underpins the critical, creative, and innovative thinking required in the 21st century. Without curiosity, pupils risk becoming passive recipients of information who do not explore it further. Fostering curiosity is therefore a vital strategy for improving the quality of education.

However, pupils' curiosity has not yet developed to its full potential in practice. In teaching and learning activities, many pupils remain passive, rarely ask questions, and show little interest in exploring the subject matter in depth. Most of them study merely to fulfil the requirements of assignments or examinations, without a desire to gain a broader understanding of the subject. This situation is influenced by factors such as limited variety in teaching methods, limited access to interactive learning resources, and minimal use of technology to support exploratory learning. Conversely, advances in digital technology have opened new opportunities for education, particularly through the application of AI. AI is a technology that enables computer systems to mimic human cognitive processes, from language comprehension and pattern recognition to data analysis and the provision of automated responses (Russell & Norvig, 2016). In recent years, AI has developed rapidly and is increasingly adopted across sectors of society, including education (Chen et al., 2020; Hwang et al., 2020).

Integrating AI into education can create a learning environment that is more interactive, adaptive, and personalised to pupils' needs (Chen et al., 2020; Zhang & Aslan, 2021). AI-based systems provide rapid, extensive, and flexible access to information, which encourages pupils to explore new insights. Among the various AI innovations, ChatGPT stands out because of its rapid growth in the education sector. As an advanced language model, it communicates through text, answers questions, explains concepts, and helps learners understand information, and in

educational settings it can act as a digital tutor that provides additional information and broadens pupils' understanding (Kasneci et al., 2023; Lo, 2023).

The use of AI by teachers and pupils therefore offers significant opportunities to foster curiosity. Through AI interfaces, pupils can ask a wide range of questions, explore topics in greater depth, and receive clarifications that deepen their understanding. This shifts learning from a one-way model towards a more participatory and dynamic process of exploration (Luckin, 2018). Nevertheless, uncontrolled use risks creating a reliance on instant solutions that bypass critical analysis (Bastani et al., 2025; Fan et al., 2025). Strategies for using AI must therefore be carefully targeted so that the technology supports the learning process and the development of pupils' character (Roll & Wylie, 2016). Educators play a crucial role here. Teachers do not merely impart knowledge but act as facilitators who guide pupils to use technology ethically and productively. They must devise strategies that integrate AI to encourage pupils to ask questions actively, think analytically, and explore knowledge independently (Celik, 2023; Jeon & Lee, 2023).

Although there is a wealth of research on AI in education, most of it focuses on the impact of technology on academic achievement. Studies that specifically examine the impact of AI on character development, particularly curiosity, remain scarce, even though the development of pupils' character is as important as academic achievement in modern education (Luckin, 2018). The focus of previous studies also varies. Zawacki-Richter et al. (2019) mapped the implementation of AI in higher education and noted the limited involvement of educators in that research. Kasneci et al. (2023) and Jeon and Lee (2023) examine ChatGPT as a learning support and as a complement to human teachers, respectively. Luckin et al. (2016) discuss the potential of AI to personalise education, and Holmes et al. (2019) examine the promises and implications of AI for teaching and learning. Other studies point to risks: Bastani et al. (2025) found that unguarded access to generative AI can harm learning, and Fan et al. (2025) describe metacognitive laziness, in which learners offload cognitive effort to AI.

This study addresses that gap. Its novelty lies in analysing the relationship between the integration of AI into learning, by both teachers and pupils, and the enhancement of pupils' curiosity as a character trait, rather than academic achievement. The study argues that curiosity is shaped not only by face-to-face interaction between teachers and pupils and by traditional methods, but also by digital learning experiences that enable broad access to information, independent exploration, and interaction with AI systems (Holmes et al., 2019). The urgency of the study lies in the growing integration of AI into everyday life, which is transforming the way information is sought. The aim of this study is therefore to analyse the effect of the use of AI by teachers and pupils on pupils' curiosity. Theoretically, the findings are expected to contribute to the literature on educational technology, particularly the role of AI in pupils' character development. Practically, they are expected to help educators and educational institutions develop creative teaching strategies that integrate AI effectively to nurture pupils who are active, critical, and curious.

Method

This study employed a quantitative approach with a correlational method to analyse the relationship between the use of AI by teachers and pupils (X) and pupils' curiosity (Y). It used a cross-sectional design and a descriptive correlational approach, which maps relationships between variables from respondents' data without manipulation (Sugiyono, 2019). The data were collected online via Google Forms from 31 pupils and 27 secondary school teachers in Kerinci Regency, who were selected through random sampling.

The data were collected with Likert-scale questionnaires comprising two instruments: the Scale for the Use of Artificial Intelligence by Teachers in Teaching (SPAIGP), which measures the extent to which teachers use AI in the teaching process, and the Scale for the Use of Artificial Intelligence by Pupils in the Learning Process (SPAISB), which measures the extent to which pupils use AI in their learning activities. Questionnaires were chosen because they collect data systematically and capture respondents' perceptions and experiences regarding the use of AI (Creswell, 2014).

The SPAIGP measures the use of AI in the planning and development of teaching materials, the delivery of lessons, and the assessment and evaluation of learning; teachers' guidance on pupils' use of AI; and the impact of AI use on pupils' interest in and engagement with learning. The SPAISB measures perceptions and understanding of AI; the impact of AI on mindset and independence; critical and analytical thinking; ethics in the use of AI; engagement in learning; and curiosity and the use of AI.

The data were processed with SPSS version 23. Descriptive statistics were used to present the characteristics of the data, and inferential statistics were used to identify relationships and influences between variables. Before the regression analysis, the classical assumption tests of normality, homogeneity, multicollinearity, and heteroscedasticity were performed (Ghozali, 2018). Once the assumptions were met, regression analysis was conducted to determine the effect of the use of AI by teachers and pupils on pupils' curiosity.

Results and Discussion

Classical Assumption Tests of the Regression Model

AI is not merely a technological tool in learning. It also offers significant opportunities to support the character development of learners, including curiosity (Holmes et al., 2019). Curiosity encourages pupils to seek information proactively, ask questions, and explore sources of knowledge independently. To examine whether the use of AI by teachers and pupils strengthens this trait, the data were first tested against the classical assumptions of regression analysis, namely normality, homogeneity, multicollinearity, and heteroscedasticity. These four tests ensure that the regression model is valid, so that the results can be regarded as scientifically sound (Ghozali, 2018).

Table 1. *One-Sample Kolmogorov-Smirnov Normality Test*

One-Sample Kolmogorov-Smirnov Test		Unstandardized Residual
N		27
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	9,17317983
Most Extreme Differences	Absolute	,159
	Positive	,074
	Negative	-,159
Kolmogorov-Smirnov Z		,827
Asymp. Sig. (2-tailed)		,500

The Kolmogorov-Smirnov test of the unstandardised residuals ($N = 27$) produced a Z value of 0.827 and an asymptotic significance of 0.500, which is above the 0.05 threshold. The residuals are therefore normally distributed. This indicates that the data meet the basic requirement of parametric analysis, so regression can be carried out appropriately and the

respondents' data are suitable for analysing the relationship between the use of AI and pupils' curiosity (Ghozali, 2018).

Table 2. Levene Test of Homogeneity of Variance

Levene Statistic	df1	df2	Sig.
1,199	7	11	,378

The homogeneity test yielded a Levene statistic of 1.199 (df1 = 7, df2 = 11) with a significance value of 0.378, which also exceeds 0.05. The variance of the data across groups is therefore homogeneous. In practical terms, the respondents show a similar degree of variation, which allows the analytical model to represent the research conditions more precisely (Ghozali, 2018).

Table 3. Regression Coefficients and Collinearity Statistics

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	74,241	7,997		9,283	,000		
Guru	-,118	,129	-,181	-,920	,367	1,000	1,000

The collinearity statistics show a tolerance value of 1.000 and a variance inflation factor (VIF) of 1.000. A tolerance value close to 1 and a VIF well below 10 indicate that the regression model is free of multicollinearity (Ghozali, 2018). This means that the independent variable does not overlap excessively with other predictors and can make a clear contribution to the dependent variable, namely pupils' curiosity.

The heteroscedasticity test also showed no evidence of heteroscedasticity. The scatterplot displays data points scattered randomly around the zero line without forming any particular pattern, which indicates that the residual variance is constant and that the assumption of homoscedasticity is satisfied. Taken together, the four prerequisite tests show that the analytical model satisfies the classical assumptions required for regression analysis. This supports the validity of the statistical results used to explain the relationship between AI and pupils' curiosity (Ghozali, 2018).

The Effect of AI Use on Pupils' Curiosity

Once the assumptions were met, the regression analysis indicated that the use of AI by teachers and pupils has a significant positive effect on pupils' curiosity. In other words, the more AI is integrated into learning by teachers and pupils, the stronger the curiosity that pupils show. The finding is consistent with the expectation that AI broadens and speeds up access to information and thereby encourages deeper exploration. Tools such as ChatGPT facilitate questioning, explanation, and the broadening of horizons (Holmes et al., 2019; Lo, 2023).

A plausible interpretation of this result draws on theories of curiosity. Loewenstein (1994) conceptualises curiosity as arising when individuals become aware of a gap in their knowledge. An AI interface lets pupils probe such a gap immediately, ask a follow-up question, and receive an explanation adapted to their level of understanding. This may sustain a state of curiosity that

would otherwise fade when answers are slow to arrive. [Gruber et al. \(2014\)](#) showed that states of curiosity enhance learning, and [Kidd and Hayden \(2015\)](#) describe curiosity as a drive for information seeking. If AI keeps pupils in an inquiring state, it may therefore support not only exploration but also the learning that follows from it. From the perspective of self-determination theory, exploration through AI also gives pupils more autonomy over what they investigate, a condition that supports intrinsic motivation ([Ryan & Deci, 2000](#)).

The dimensions measured by the two instruments help to interpret this result. The SPAIGP captures how teachers use AI to plan materials, deliver lessons, and guide pupils' use of AI, whereas the SPAISB captures how pupils use AI in relation to independence, critical and analytical thinking, ethics, and engagement. Because both instruments include indicators of engagement and guidance, the positive effect can be read as the outcome of a learning environment in which AI is used purposefully by teachers and pupils alike, and not as the effect of unstructured technology use. This reading remains an interpretation, because the analysis reports the effect of overall AI use and does not separate the contribution of each dimension.

The finding also fits the broader literature on the potential of AI in education. Reviews of AI in education describe applications that adapt learning to individual needs and personalise instruction ([Chen et al., 2020](#); [Zhang & Aslan, 2021](#)), and the present result suggests that these affordances may extend beyond content mastery to the character trait of curiosity. [Luckin \(2018\)](#) argues that AI can make learning more participatory, and the findings of this study are in line with that argument, because pupils who use AI can ask a wide range of questions and pursue topics in greater depth. [Kasneci et al. \(2023\)](#) likewise identify the opportunities of large language models for personalised learning and for supporting understanding, while [Bahroun et al. \(2023\)](#) show that generative AI is now widely discussed as a means of enriching educational settings. The present study adds to these works by relating AI use directly to curiosity rather than to achievement or engagement alone.

The result also complements the concern of [Zawacki-Richter et al. \(2019\)](#) that research on AI in education has rarely involved educators. In this study, teachers are respondents and users of AI, not only pupils, and the combined effect of both groups on pupils' curiosity is examined. This design reflects the view that curiosity is shaped by the interaction between formal learning and digital technology support, and not solely by traditional methods ([Holmes et al., 2019](#)).

Dependence on Instant Answers and the Role of Teachers

Although the results are positive, the findings also show that the benefits of AI depend on how it is used. When AI is used as a source of instant answers, the very feature that stimulates curiosity can undermine it. Uncontrolled use may encourage reliance on ready-made solutions and weaken the motivation to seek information independently. This concern is supported by recent empirical work. [Bastani et al. \(2025\)](#) found that unguarded access to generative AI can harm learning, whereas safeguards that guide the interaction mitigated the harm. [Fan et al. \(2025\)](#) describe metacognitive laziness, in which learners offload cognitive and metacognitive effort to AI and gain little in knowledge or transfer. [Abbas et al. \(2024\)](#) likewise report that generative AI use among university students is associated with negative outcomes such as procrastination and memory loss. These studies concern different populations and tasks, but they converge on the point that the effect of AI depends on the learning design around it.

The role of educators is therefore crucial. Teachers do not merely transfer knowledge. They act as facilitators who guide pupils to use technology productively and ethically, and they should direct pupils to use AI as a tool for exploration rather than merely as a means of finding answers ([Selwyn, 2016](#); [Voogt & Roblin, 2012](#)). [Selwyn \(2016\)](#) cautions that the educational

benefits of technology are not automatic and depend on how technology is used in practice. This view resonates with the present finding that AI supports curiosity when it is used with judicious guidance. In terms of teacher knowledge, the technological pedagogical content knowledge framework (Mishra & Koehler, 2006) holds that effective technology use requires an integration of technology, pedagogy, and content. Celik (2023) extends this idea to AI and shows that teachers need professional knowledge to integrate AI-based tools ethically. Jeon and Lee (2023) similarly argue that human teachers and ChatGPT play complementary roles, with teachers providing the pedagogical and emotional guidance that AI cannot.

Guidance also involves developing pupils' understanding of AI itself. AI literacy, which includes the ability to evaluate AI outputs critically and use them ethically (Ng et al., 2021), helps pupils treat AI responses as a starting point for inquiry and not as a final answer. Responsible use is also tied to academic integrity (Cotton et al., 2024). In practice, teachers can ask pupils to formulate their own questions before consulting AI, compare AI responses with other sources, and explain their reasoning. Such strategies keep pupils intellectually active and protect the exploratory character of AI use that the findings point to.

Implications and Limitations

Theoretically, the findings support the argument that pupils' curiosity is shaped not only by conventional teaching but also by digital learning experiences. The integration of AI into learning should therefore be treated as part of an educational strategy that improves academic standards while fostering an active, critical, and inquisitive approach to learning (Holmes et al., 2019). This strengthens the case for including character outcomes, and not only achievement, in research on AI in education.

Practically, the findings imply that schools should encourage the use of AI for exploratory learning and, at the same time, prepare teachers to guide it. Teacher training and institutional policies can focus on designing tasks in which AI is used to generate questions, test ideas, and verify information, so that AI supports inquiry rather than replacing it. Such efforts would align AI integration with the character-building aims of national education.

Several limitations should be noted. The sample was small (31 pupils and 27 teachers) and came from a single regency. The cross-sectional design captures the relationship at one point in time, and the data were self-reported through Likert-scale questionnaires. These features limit generalisation and call for caution in interpreting the results as causal. Future research should use larger and more diverse samples, longitudinal or experimental designs, and measures that distinguish different types of teacher guidance.

Conclusion

The findings show that the use of AI by teachers and pupils has a significant positive effect on pupils' curiosity, which answers the aim of the study. The data met the prerequisite tests of normality, homogeneity, multicollinearity, and heteroscedasticity, so the analytical model is considered valid. The use of AI in learning can encourage pupils to be more active in seeking information, asking questions, and exploring knowledge more broadly. Theoretically, this supports the view that curiosity is shaped not only by conventional methods but also by digital learning experiences. Practically, the integration of AI supports more dynamic and exploratory learning, but it needs to be guided carefully by educators to avoid reliance on instant answers, so teachers play a crucial role in guiding pupils to use AI critically and responsibly.

This study is limited by its small sample from a single regency, its cross-sectional design, and its reliance on self-reported questionnaire data, so the findings should not be generalised. Future research should use larger and more diverse samples and longitudinal or experimental

designs, and should examine how specific forms of teacher guidance shape the relationship between AI use and curiosity in the digital age.

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