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The Impact of Artificial Intelligence Media Usage on Students' Learning Patterns and Interest in Learning

(A Study at SMA Kristen Tunas Bangsa – Kupang, Indonesia)

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ABSTRACT

This study investigates the impact of AI-based learning media on students' learning patterns and their interest in learning. A quantitative approach was employed, with data collected through structured questionnaires administered to students at SMA Kristen Tunas Bangsa, Kupang. The survey assessed students' AI usage, learning patterns, and interest in learning. Multiple linear regression was used to analyze the data and explore the relationship between AI usage and the two outcomes: learning patterns and interest in learning. The findings revealed a statistically significant positive relationship between AI usage and both learning patterns (coefficient = 0.4472, p = 0.0008) and interest in learning (coefficient = 0.5616, p = 0.00001). This indicates that AI-based learning media not only enhances students' engagement with academic content but also boosts their motivation to learn. The study supports the Uses and Effects Theory, demonstrating that AI tools address both cognitive and emotional needs, improving students' academic behaviors and increasing their enthusiasm for learning. These results highlight the potential of AI to transform educational practices. The study recommends broader adoption of AI-based learning tools in schools and suggests that further research should explore the long-term impact of AI on student academic outcomes, including its potential effects on lifelong learning and student achievement.

Keywords: Artificial Intelligence, learning patterns, student interest, AI in education, SMA Kristen Tunas Bangsa

INTRODUCTION

The integration of Artificial Intelligence (AI) in educational settings has sparked considerable interest due to its potential to significantly improve students' learning outcomes, particularly in terms of their learning patterns and motivation. AI technologies, such as intelligent tutoring systems, adaptive learning platforms, and virtual assistants, offer personalized learning experiences that cater to individual students' needs by providing customized content and real-time feedback. These technologies have the ability to enhance both cognitive and emotional engagement, which is crucial for improving academic success and fostering a deeper interest in learning.

Several studies have explored the role of AI in education, demonstrating its positive effects on student performance and engagement. A study by Chen et al. (2020) emphasized that AI-powered learning systems could lead to more interactive and personalized experiences, thereby increasing student motivation and engagement [1]. Similarly, Zawacki-Richter et al. (2019) conducted a systematic review of AI applications in higher education, highlighting how AI could shift traditional, passive learning modes into more active and participatory ones, which is key for developing critical thinking and problem-solving skills [2]. These findings align with the belief that AI can not only improve the quality of education but also make learning more enjoyable and meaningful.

Furthermore, AI has been studied in various educational contexts, ranging from primary schools to universities. Research by Sugiarso et al. (2024) explored the impact of AI on students' academic performance at the high school level. Their study found that AI could help teachers enhance students' competencies and improve their academic achievements [3]. Likewise, Muchminin et al. (2022) examined the use of AI in a university setting, concluding that AI applications significantly boosted students' interest in learning, particularly in the field of Informatics. Both studies suggest that AI's ability to engage students and make learning more interactive can contribute to increased academic success [4].

Despite the growing body of research, there are still gaps in understanding how AI affects students' learning patterns. While many studies focus on AI's impact on motivation and academic performance, fewer have examined how AI influences students' learning

strategies, study habits, and general approaches to education. These factors are critical in assessing the long-term effects of AI on student development. Additionally, most studies have explored AI's role in enhancing motivation or academic performance in isolation, while there is limited research on its influence on students' broader learning behaviors, such as time management, peer collaboration, and self-regulated learning.

This research aims to address these gaps by exploring how AI influences both the learning patterns and the motivation of students at SMA Kristen Tunas Bangsa, a high school in Kupang, Nusa Tenggara Timur, Indonesia. The school's curriculum is unique, integrating both character development and academic learning, creating an ideal setting for investigating how AI can shape students' learning behaviors. By examining how AI influences not only students' academic performance but also their learning habits, this study hopes to provide deeper insights into the complex relationship between AI usage and student outcomes.

In addition to its academic benefits, the integration of AI in education presents a potential for increasing efficiency and providing more personalized learning pathways for students. According to Sharma & Sharma (2023), AI can help tailor the learning experience by offering content that matches students' pace and understanding, leading to better retention of knowledge. Furthermore, AI enables continuous assessment and instant feedback, which supports students in overcoming challenges and advancing through the curriculum at their own pace [5]. These personalized learning pathways can be particularly beneficial in diverse classrooms, where students may have varying levels of prior knowledge and learning preferences. Personalized learning, facilitated by AI, has been shown to promote higher engagement, making students more likely to take ownership of their learning and to seek out opportunities for further exploration and mastery.

Despite these advantages, the adoption of AI in education does not come without its challenges. One concern is the over-reliance on technology, which may reduce face-to-face interactions between students and teachers, as well as between peers. Suharyat (2023) highlighted that excessive dependence on AI could limit the development of essential social and emotional skills that are cultivated through human interactions in a traditional classroom setting. Additionally, AI systems can introduce biases depending on the data they are trained on, leading to potential inequities in educational outcomes if not carefully monitored [6].

Thus, while AI holds great promise for enhancing educational experiences, it is crucial to explore its effects within specific educational contexts, such as high schools with diverse student populations. This study aims to: analyze the effect of using AI media on learning patterns and student interest in learning.. By doing so, it will provide a clearer understanding of how AI can be effectively integrated into learning environments to support both cognitive and emotional aspects of education, ensuring that students benefit from a well-rounded educational experience that prepares them for future challenges.

Literature Review

Artificial Intelligence (AI) in education has gained significant attention as a powerful tool that can shape students' learning patterns and motivation. The application of AI technology in educational settings offers personalized, adaptive learning experiences that are tailored to the individual needs of students. The Uses and Effects Theory, as developed by Steve H. Chaffee, provides a robust framework for understanding how AI, as a media tool, can influence students' academic outcomes. This theory suggests that individuals actively select and utilize media based on specific needs and desires, and in this context, AI is used by students to meet their educational goals. The theory integrates the Uses and Gratifications Theory, which emphasizes the active role of users in choosing media to fulfill particular needs, and the Media Effects Theory, which looks at the outcomes of media usage, including how it can affect individuals' attitudes, behaviors, and perceptions [7].

In the realm of education, AI is increasingly integrated into learning environments, offering systems that adapt content to match students' learning styles and provide real-time feedback. This aligns with the Uses and Gratifications Theory, which posits that students actively engage with AI media to satisfy various needs—whether to acquire knowledge, improve skills, or simply to feel more confident in their abilities. AI's ability to provide immediate, personalized responses can enhance students' motivation, as it creates a learning experience that aligns with their individual needs, which is particularly valuable in diverse classrooms where students may have different learning paces and styles. By offering tailored learning paths and immediate reinforcement, AI systems cater to both cognitive and emotional needs, fostering a deeper connection to the learning process and making education more engaging [8].

The Media Effects Theory, a central component of the Uses and Effects Theory, further explains the impact of AI on students' learning behaviors and attitudes. This theory suggests that the way students interact with AI tools influences their perceptions of learning and their motivation to continue engaging with educational content. AI systems, by providing adaptive feedback and personalized learning experiences, contribute to shaping students' attitudes toward learning, as students tend to feel more motivated when the content is relevant and aligns with their learning goals. Research has shown that AI can transform traditional, passive learning environments into more active and participatory ones, increasing students' involvement in the learning process and, consequently, their motivation to learn [9]. This effect of AI on students' learning patterns is consistent with the principles of the

Media Effects Theory, which emphasizes how media consumption can lead to shifts in behavior and attitudes.

Moreover, studies have demonstrated that AI enhances learning by promoting more autonomous, self-directed learning behaviors. As noted by Ryan Baker (2017), AI provides students with tools to track their progress, manage their study routines, and engage with content in ways that are best suited to their learning styles, ultimately leading to improved learning outcomes [9]. The use of AI in education not only aids in providing personalized learning but also promotes self-regulation, as students can make informed decisions about their study habits and take responsibility for their learning. This ability to engage in self-regulated learning is essential for students, as it encourages them to take ownership of their educational journey, leading to increased motivation and better academic performance.

However, while AI offers numerous benefits in education, there are challenges that need to be addressed. One concern is the over-reliance on AI, which may reduce essential human interaction in the learning process. According to Suharyat (2023), excessive dependence on AI could limit the opportunities for students to engage in social learning, such as collaborative activities and face-to-face interactions, which are integral to the development of social and emotional skills [6]. These skills are crucial for students' overall development and cannot be fully replaced by technology. Therefore, it is important to strike a balance between the use of AI and traditional learning methods to ensure that students continue to benefit from both personalized learning and social interactions.

Another concern is the potential for AI systems to reinforce biases or inequalities, as the algorithms used to personalize learning can sometimes favor certain student behaviors or learning styles over others. As Suharyat (2023) points out, if AI systems are not carefully monitored, they can unintentionally disadvantage students from different backgrounds or with unique learning needs [6]. This highlights the importance of ensuring that AI systems are designed and implemented in ways that are equitable and inclusive, offering all students an opportunity to succeed and engage meaningfully with their education.

Despite these challenges, the integration of AI in education offers significant potential to transform learning environments by making them more personalized, engaging, and efficient. As AI systems continue to evolve, it is crucial to explore their impact on students' learning patterns and motivation. This research aims to fill the gap in understanding how AI media influences not only students' academic performance but also their learning behaviors, such as study habits, self-regulation, and collaboration with peers. By using the Uses and Effects Theory to analyze these relationships, the study seeks to provide valuable insights into how AI can be effectively integrated into educational settings to enhance learning outcomes and foster a more motivated and engaged student body. Ultimately, understanding the effects of AI in education will allow educators and policymakers to make informed decisions about how best to implement AI technologies to support students' academic growth and personal development.

Methodology

The methodology for this research was based on a quantitative approach, as the primary aim was to assess the impact of Artificial Intelligence (AI) media on students' learning patterns and their interest in learning. This research employed a survey research design, which was suitable for collecting data from a large number of participants, allowing for generalizable conclusions about the relationship between AI media usage and student outcomes. A cross-sectional design was used, collecting data at a single point in time to analyze the current effects of AI media on learning behaviors and motivation among students at SMA Kristen Tunas Bangsa, Kupang, as described in Creswell's work on research design [10].

The school was chosen for this study due to its early adoption of AI-based educational tools. The school's student population of 75 and faculty of 14 teachers provided a diverse environment, ideal for examining the influence of AI in a real-world educational setting. The student body came from various socio-economic backgrounds, which could impact their access to and engagement with technology, thus offering an opportunity to explore the effects of AI in a mixed-ability classroom. This aligned with the ideas presented by Creswell, who emphasized the importance of context when selecting a research site and sampling method [10].

To measure the relationship between AI media usage and learning outcomes, data were collected using a structured questionnaire distributed to students. The questionnaire assessed two main variables: learning patterns and interest in learning. Learning patterns were evaluated based on students' study habits, strategies for processing and retaining information, and levels of engagement during learning activities. Additionally, the questionnaire assessed the frequency and type of AI tools used by students, as well as their perceptions of the effectiveness of these tools. The second variable, interest in learning, was measured through questions related to students' motivation, enthusiasm for learning, and desire to explore new educational content. The use of surveys for this purpose followed Field's approach in utilizing structured tools to quantify behaviors and outcomes [11].

For data analysis, descriptive and inferential statistics were used. Descriptive statistics summarized general trends in the data, such as the frequency of AI media use and the distribution of learning patterns and interest in learning. Multiple linear regression analysis was conducted to examine the relationship between the independent variable (AI media usage) and the dependent variables (learning

patterns and interest in learning). This method was suitable for understanding the effect of multiple predictors on a single outcome. Specifically, the analysis helped determine the strength and direction of AI media's influence on students' learning behaviors and motivation, while controlling for other potential confounding variables, such as socio-economic background and prior academic performance. Regression analysis was widely recommended for such studies, as highlighted by Field in his work on statistics [11].

The multiple linear regression model can be represented by the following formula:

$$X= a+\mathbf{b1Y1}+\mathbf{b2Y2}+e$$

Where:

Y = dependent variable or predicted value

a = constant

b1 = regression coefficient for Y1

b2 = regression coefficient for Y2

Y1 = first independent variable

Y2 = second independent variable

e = residual value

The hypotheses of this study were:

H1: The use of AI-based learning media positively influences students' learning patterns.

H2: The use of AI-based learning media positively influences students' interest in learning.

H3: The use of AI-based learning media simultaneously has a positive effect on student learning patterns and student interest in learning.

Findings

Regression for Learning Patterns (H1)

The regression analysis for learning patterns demonstrated a positive and statistically significant relationship between AI usage and students' learning behaviors. The model's summary statistics and results are as follows:

Variable	Coefficient	Standard Error	t-value	p-value	95% Confidence Interval
Constant	1.7182	0.4631	3.710	0.0004	[0.7952, 2.6411]
AI Usage	0.4472	0.1274	3.511	0.0008	[0.1933, 0.7010]

Interpretation:

- AI Usage has a coefficient of 0.4472, which means that for every unit increase in AI usage, students' learning patterns increase by 0.4472 units, assuming other factors are constant. This indicates a positive effect of AI usage on students' learning behaviors.
- The p-value for AI Usage is 0.0008, indicating that the relationship between AI usage and learning patterns is statistically significant.
- The 95% confidence interval for AI Usage is [0.1933, 0.7010], confirming the strength of the relationship.

The results confirm that AI-based learning media positively influences students' learning patterns, supporting H1.

Regression for Interest in Learning (H2)

The regression analysis for interest in learning also revealed a positive and statistically significant relationship with AI usage. The results are as follows:

Variable	Coefficient	Standard Error	t-value	p-value	95% Confidence Interval
Constant	1.3215	0.4371	3.024	0.0034	[0.4504, 2.1926]
AI Usage	0.5616	0.1202	4.672	0.00001	[0.3221, 0.8012]

Interpretation:

- AI Usage has a coefficient of 0.5616, meaning that for every unit increase in AI usage, students' interest in learning increases by 0.5616 units, assuming other factors remain constant.
- The p-value for AI Usage is 0.00001, which is far below the 0.05 threshold, indicating that this effect is statistically significant.
- The 95% confidence interval for AI Usage is [0.3221, 0.8012], confirming the significance of this positive effect.

These results demonstrate that AI-based learning media has a significant positive influence on students' interest in learning, supporting H2.

Simultaneous Effect of AI on Learning Patterns and Interest in Learning (H3)

The findings from the regressions for both learning patterns and interest in learning suggest that AI usage has a positive impact on both outcomes. In particular:

- The relationship between AI usage and learning patterns (H1) is statistically significant with a coefficient of 0.4472, which suggests that AI usage enhances students' engagement with learning material and their ability to retain and apply knowledge.
- The relationship between AI usage and interest in learning (H2) is also statistically significant, with a coefficient of 0.5616, indicating that AI usage fosters greater motivation, curiosity, and enthusiasm for learning.

These findings provide strong support for H3, which posits that AI usage positively influences both learning patterns and interest in learning simultaneously. The coefficients for AI Usage in both regressions are positive and significant, further confirming the dual impact of AI on students' learning behaviors and motivation.

To better illustrate the regression results, the following visualizations represent the relationships between AI usage and both learning patterns and interest in learning, The first graph below shows the positive correlation between AI usage and students' learning patterns. As AI usage increases, so do students' learning behaviors, as shown by the red regression line. The second graph illustrates the positive relationship between AI usage and students' interest in learning. The blue regression line indicates that as AI usage rises, students' motivation and enthusiasm for learning also increase.

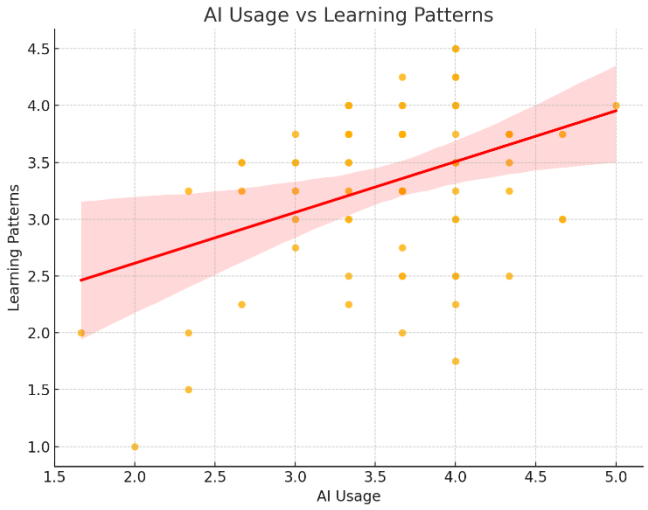

Figure 1: AI Usage vs Learning Patterns

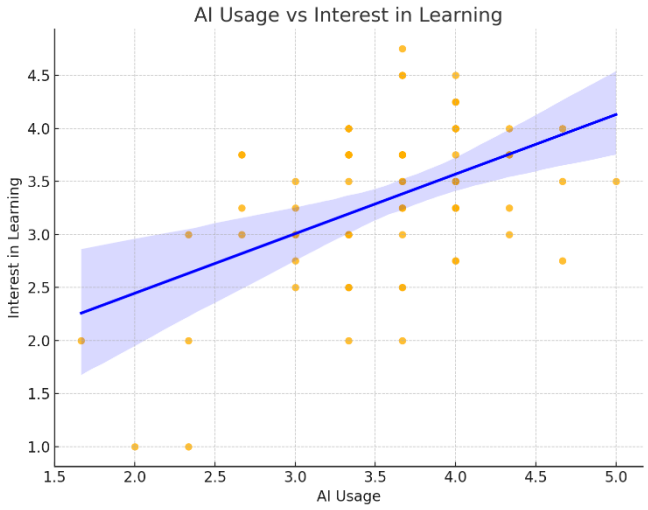

Figure 2: AI Usage vs Interest in Learning

The multiple linear regression analysis confirmed the hypotheses of this study:

H1: AI-based learning media positively influences students' learning patterns.

H2: AI-based learning media positively influences students' interest in learning.

H3: AI-based learning media has a simultaneous positive effect on both students' learning patterns and student interest in learning.

The regression results show that AI usage plays a significant role in enhancing students' academic behaviors and motivation, making it a valuable tool in educational settings. The findings suggest that AI can help students engage more effectively with learning materials, increase their interest in learning, and provide a more personalized, adaptive learning experience. These results have important implications for educators and policymakers looking to integrate AI into educational settings to enhance both learning outcomes and student engagement.

Discussion

The findings of this research offer significant insights into the role of Artificial Intelligence (AI) in enhancing students' learning patterns and increasing their interest in learning. Through multiple linear regression analysis, it was confirmed that AI-based learning media has a positive effect on both students' learning behaviors and their motivation to engage in learning. These results align with the theoretical framework of the Uses and Effects Theory, which suggests that individuals use media to fulfill specific needs, and the consumption of media can, in turn, lead to measurable changes in behavior, cognition, and emotions.

The present study found that AI usage positively influenced students' learning patterns. This outcome is consistent with previous research that underscores the role of technology in enhancing student engagement and academic performance. As AI-based media provides personalized learning experiences and real-time feedback, it encourages more active and participatory learning behaviors. The significant positive coefficient for AI usage in the regression model supports the idea that students are not passive consumers of educational content but rather active participants who use AI as a tool to deepen their understanding of academic materials and refine their learning strategies. The positive relationship between AI usage and learning patterns is supported by the findings of other studies, such as those by Chen et al. [12], which suggest that AI-based learning tools foster deeper cognitive engagement and improve knowledge retention through individualized learning experiences.

Similarly, the interest in learning was also significantly influenced by AI usage. The coefficient for AI usage in relation to students' interest in learning was even higher than that for learning patterns, which indicates that the emotional and motivational aspects of learning may be more strongly affected by AI than the cognitive aspects. This finding is particularly important because motivation plays a crucial role in students' academic success and persistence. Research has shown that students who are motivated to learn are more likely to engage with educational content and achieve higher academic outcomes. AI-based tools provide instant feedback and allow for self-paced learning, which may increase students' sense of competence and autonomy—key components of motivation, as outlined in Self-Determination Theory (Deci & Ryan, 1985). This aligns with the findings of Zawacki-Richter et al. [13], who

argued that AI in education can enhance intrinsic motivation by catering to individual learning needs and providing a sense of achievement through personalized learning paths.

The findings also reinforce the Uses and Effects Theory as a theoretical foundation for understanding how AI media influences student behavior. According to the Uses and Gratifications Theory—a component of the broader Uses and Effects Theory—media is actively used by individuals to fulfill specific needs, whether cognitive, emotional, or social. In the context of education, students use AI-based learning tools to meet their learning needs, whether it is acquiring new knowledge, reinforcing existing concepts, or receiving immediate feedback on their performance. The theory suggests that media consumption leads to specific changes in behavior and attitudes, and this is precisely what was observed in this study. The increased engagement with AI-driven learning tools not only improved students' learning patterns but also heightened their interest in learning, confirming that AI serves both as a tool for achieving learning goals and as a catalyst for motivating students to pursue academic success.

The media effects of AI, as proposed by the Media Effects Theory, further support these findings. The Media Effects Theory posits that media consumption can lead to lasting changes in individual behavior, attitudes, and perceptions. In this study, the consumption of AI media was linked to positive changes in both students' cognitive and affective outcomes—learning patterns and interest in learning. The findings suggest that AI is not just a passive tool in the classroom but a dynamic agent that influences how students approach learning and how engaged they feel with the subject matter. These effects are consistent with the broader body of literature on technology-mediated learning, which highlights that media can shape students' attitudes towards learning and influence their academic behaviors. For instance, studies by Baker [14] and Luckin [15] have demonstrated that AI systems can significantly enhance student motivation and engagement by offering personalized and adaptive learning experiences.

Moreover, the simultaneous effect of AI on both learning patterns and interest in learning, as proposed in Hypothesis 3, adds a layer of complexity to the understanding of media consumption in educational contexts. AI's influence on both cognitive and motivational outcomes highlights the interconnectedness of learning behaviors and emotional engagement. The ability of AI systems to simultaneously address both cognitive and emotional needs is a distinctive feature that sets it apart from traditional teaching methods. For instance, while traditional learning environments primarily focus on the delivery of content, AI systems are capable of adapting the content and providing feedback in real-time, thus fostering both academic growth and intrinsic motivation. This dual effect further reinforces the argument made by Uses and Gratifications Theory, which asserts that media is a tool that satisfies multiple needs and leads to changes in attitudes and behaviors. The findings of this study indicate that AI can fulfill both students' cognitive needs (e.g., understanding and mastering content) and their emotional needs (e.g., motivation and engagement), making it a highly effective educational tool.

While the findings of this study contribute to the growing body of literature on AI in education, there are several implications for future research. First, while the regression results show a positive impact of AI on learning patterns and interest in learning, the effect size is relatively modest, with R-squared values of 0.144 for learning patterns and 0.230 for interest in learning. This suggests that AI is an important factor but not the sole determinant of students' learning behaviors and motivation. Other variables, such as classroom environment, teacher support, and peer interaction, may also play a significant role in shaping these outcomes. Future studies should explore the interactions between AI and other contextual factors to gain a more comprehensive understanding of its impact on education.

Furthermore, it would be valuable to examine the long-term effects of AI on students' learning behaviors and motivation. The current study employed a cross-sectional design, which provides a snapshot of AI's influence at a single point in time. Longitudinal studies could track the evolution of students' engagement with AI tools over time and assess how this affects their academic performance and motivation in the long run.

Conclusion

This study provides empirical evidence supporting the positive impact of AI-based learning media on both students' learning patterns and their interest in learning. The regression analysis reveals that increased usage of AI in educational settings not only enhances students' engagement and effectiveness in learning but also significantly boosts their motivation and enthusiasm for academic tasks. These findings align with the Uses and Effects Theory, which highlights that media, including AI, can serve as a tool to fulfill students' cognitive and emotional needs, leading to improved academic behaviors and outcomes.

The positive effects of AI on learning patterns and interest in learning underscore the potential for AI to be a transformative tool in educational environments. By offering personalized learning experiences, immediate feedback, and the ability to cater to individual learning needs, AI fosters both cognitive engagement and emotional motivation, which are essential components of academic success. These results support the integration of AI technologies in classrooms, encouraging active and self-directed learning.

However, while AI has shown to have a significant positive impact, the findings also suggest that AI alone is not the only factor

influencing students' learning behaviors and motivation. Other external factors, such as classroom dynamics, teacher engagement, and peer interactions, should also be considered when evaluating educational tools. Moreover, the modest effect sizes (R-squared values of 0.144 for learning patterns and 0.230 for interest in learning) indicate that further exploration is needed to fully understand the interplay between AI and other educational factors.

In light of these findings, several recommendations emerge. First, educational institutions should consider integrating AI-based learning tools more widely to enhance the learning experience. Personalized learning platforms powered by AI can be used to address diverse student needs, enabling adaptive learning that improves engagement and performance. Additionally, future research should focus on longitudinal studies to track the long-term effects of AI usage on students' academic outcomes. This will help in understanding whether the positive impacts observed are sustained over time. Furthermore, it is essential to consider pedagogical strategies in conjunction with AI tools. Teachers should be trained in how to effectively integrate AI into their teaching methods, ensuring that it complements and enhances traditional pedagogical approaches. This training should emphasize the importance of blending technology with human interaction to foster a holistic learning environment. By incorporating these recommendations, AI can play a pivotal role in transforming education and improving student outcomes across diverse learning environments.

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