

Trust and Usefulness in Students' Acceptance of AI-Based Learning: Evidence from Jakarta High Schools

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Abstract: Artificial intelligence (AI) is increasingly used as a learning medium in secondary education, yet students' acceptance of AI tools is not uniform. This study examines high school students' behavioral intention to use AI in learning by extending the Technology Acceptance Model (TAM) with perceived trust. A quantitative explanatory design was employed with a cross-sectional survey of 98 high school students in Jakarta who had experience using AI for learning. Data were analyzed using partial least squares structural equation modeling (PLS-SEM) to evaluate the measurement model and test the structural relationships among Perceived Ease of Use, Perceived Usefulness, Perceived Trust, and Behavioral Intention to Use. The results show that Perceived Usefulness ($\beta = 0.243$, $p < 0.01$) and Perceived Trust ($\beta = 0.457$, $p < 0.001$) have significant positive effects on Behavioral Intention to Use, while Perceived Ease of Use has a positive but statistically non-significant effect ($\beta = 0.184$, $p > 0.05$). These findings indicate that students' intention to use AI in learning is driven more by perceived learning benefits and confidence in the reliability and safety of AI than by usability alone. The study refines TAM applications in AI-supported education by underscoring the central role of trust and offers practical guidance for schools and developers to design AI tools that are not only easy to use but also demonstrably useful, transparent, and secure for student learning.

Keywords: Artificial Intelligence; Learning Media; Technology Acceptance Model; Perceived Trust; High School Students; Behavioral Intention

1. Introduction

This study aims to analyze the factors that influence the behavioral intentions of high school students in Jakarta in using Artificial Intelligence as a learning medium. The main focus of the research is directed at how students' perceptions of the benefits, ease of use, and level of trust in AI technology shape their desire to utilize AI in the learning process (Okulich-kazarin et al. 2024). This study places students as the main subjects because they are the direct users of AI-based learning technology in the school environment (Fakhrudin et al. 2025). By understanding students' acceptance patterns towards AI, this study seeks to provide an empirical picture of the readiness and response of the younger generation to digital transformation in education (Humble and Mozelius 2022).

This research is important because the use of AI in education is developing faster than users' readiness to utilize it optimally (Bećirović and Mattoš 2024). At the high school level, AI has great potential to improve the quality of learning through adaptive and interactive material delivery. However, this potential will not be realized if students do not have a strong intention to use it. Therefore, understanding the psychological and perceptual factors that influence the intention to use AI is crucial as a basis for educational policy-making and the development of learning technologies that are tailored to students' needs (Helal et al. 2025).

The phenomenon observed in the field shows that the use of AI as a learning medium among high school students in Jakarta is still uneven (Yusuf et al. 2024). Some students actively use AI for independent learning and completing academic assignments. Others are hesitant or reluctant to use AI because they find the technology difficult to use or unreliable. In addition, students are concerned about the accuracy of the information provided by AI and its impact on critical thinking. These differing perceptions reflect a gap in the acceptance of technology in secondary education (Gayed and Gayed 2025).

If this phenomenon is not addressed immediately, the use of AI in learning has the potential to be ineffective and even cause negative impacts (Viberg et al. 2025). Students who lack sufficient trust and understanding of AI may fall behind in utilizing modern learning technologies. This situation could widen the gap in learning quality between students. Furthermore, the use of AI without a strong foundation of acceptance risks lowering the quality of the learning process and reducing students' active role in gaining a deep understanding of the material (Granström and Oppi 2025).

Solutions to these problems require an approach based on understanding user behavior (Liang, Stephens, and Brown 2024). Schools and education stakeholders need to know the main factors that encourage or discourage students' intentions to use AI (Cruz-jesus et al. 2020). By identifying students' perceptions of the benefits, ease of use, and level of trust in AI, learning technology implementation strategies can be developed in a more targeted manner. This approach allows AI to be used as an effective and responsible learning support tool (Romero-untiveros, Melgarejo-solis, and Privada 2024).

This study uses the Technology Acceptance Model approach, which was developed by adding the variable of perceived trust to suit the context of AI technology in education (S. Wang et al. 2024). This approach is used to explain the relationship between students' perceptions and their intentions to use AI as a learning medium. The target of this study is high school students in Jakarta who have experience or exposure to the use of AI in learning activities. The results of this study are expected to contribute theoretically and practically to the development of AI-based learning at the secondary education level.

2. Literature Review

2.1. Artificial Intelligence in Learning

Artificial Intelligence has become one of the key innovations in the transformation of digital education (Manu et al. 2025). In the context of learning, AI is used to provide adaptive

materials, give real-time feedback, and help students learn independently according to their individual abilities and needs (Bany, Maqableh, and Qasim 2024). The application of AI as a learning medium allows the learning process to be more personalized and efficient (Ali et al. 2024). For high school students, AI can serve as a learning companion that helps them understand subject matter, practice thinking skills, and increase engagement in the learning process. However, the effectiveness of AI as a learning medium is highly dependent on the readiness and acceptance of students as the main users of this technology (Strzelecki and Elarabawy 2024).

2.2. Technology Acceptance Model

The Technology Acceptance Model is a conceptual framework that is widely used to explain how individuals accept and use technology in various contexts (S. Wang et al. 2024). This model explains that users' intentions to utilize technology are shaped by their assessment of the perceived level of benefit and ease of use (Zhou, Shafique, and Ahmad 2025). In the field of education, TAM is often applied to analyze students' acceptance of evolving digital learning technologies. The relevance of TAM in AI-based research lies in its ability to explain the relationship between students' perceptions and their actual behavior in using technology (Henseler, Ringle, and Sarstedt 2015). Therefore, TAM provides a strong theoretical foundation for examining the factors that influence students' intentions to adopt AI as a learning medium (Syifa Zahra Lutfiah, Andayani Komara, and Irmayanti 2023).

2.3. Perceived Trust

Perceived trust is the level of user confidence in the ability of technology to provide accurate and reliable information (Wilson, Keni, and Tan 2021). In the context of AI as a learning medium, trust is a crucial factor because students depend on the information provided by AI systems (Zhang et al. 2019). High school students tend to consider whether AI provides correct answers, is not misleading, and is safe to use in the learning process. Lack of trust in AI can cause doubt and reduce the intention to use it. Therefore, perceived trust plays an important role in explaining the acceptance of AI technology, especially in the field of education (J. Wang et al. 2021).

3. Methodology

3.1. Research Design

This study uses a quantitative approach with an explanatory research design. This approach was chosen to test the causal relationship between perceived usefulness, perceived ease of use, perceived trust, and behavioral intention to use Artificial Intelligence as a learning medium. The research was conducted using a survey method with a structured questionnaire distributed to high school students in Jakarta. Data were collected within a single time period, making this a cross-sectional study. This design allowed researchers to obtain an empirical picture of the factors that influence students' intentions to use AI in the context of learning.

3.2. Population and Sample

The population of this study comprised all high school students in Jakarta who had experience using or exposure to AI technology as a learning medium. Because the exact population size was unknown, the minimum required sample size was determined using the Lemeshow formula for proportions in large or unknown populations:

$$n = \frac{Z_{\alpha/2}^2 p(1 - p)}{d^2}$$

where n is the minimum sample size, $Z_{\alpha/2}$ is the Z-value at the desired confidence level, p is the expected proportion of the population with the characteristic of interest, and d is the acceptable margin of error. In this study, a 95% confidence level was used ($Z_{\alpha/2} = 1.96$), with an assumed proportion $p = 0.5$ (maximum variability) and a margin of error $d = 0.10$. Substituting these values into the formula yielded:

$$n = \frac{(1.96)^2 \times 0.5 \times (1 - 0.5)}{(0.10)^2} \approx 96$$

Thus, the minimum required sample size was 96 students. The final sample consisted of 98 respondents, which exceeds this minimum requirement and is adequate for analysis using the partial least squares approach.

3.3. Data Collection Technique

Primary data was collected through an online questionnaire. The research instrument was developed based on indicators adapted from previous studies and adjusted to the context of AI use as a learning medium. Each statement was measured using a five-point Likert scale that indicated the respondents' level of agreement with the given statement. The questionnaire was distributed directly to respondents who met the research criteria. All collected data was used as the basis for analysis without eliminating any respondents.

3.4. Data Analysis Technique

The data obtained were analyzed using the Partial Least Squares-based Structural Equation Modeling method with the help of SmartPLS software. This method was chosen because it is capable of analyzing the relationships between latent variables simultaneously and does not require strict assumptions of data normality. The analysis stages included measurement model evaluation and structural model evaluation. Measurement model evaluation was conducted to test the validity and reliability of the constructs. Structural model evaluation was conducted to test the relationships between variables and research hypotheses. The use of SmartPLS was deemed appropriate for the characteristics of the data and the objectives of this study.

4. Results

Before testing the structural relationships, this study first evaluated the measurement model to ensure that the Technology Acceptance Model constructs used Perceived Ease of Use, Perceived Usefulness, Perceived Trust, and Behavioral Intention to Use reliably measured the acceptance of AI as a learning medium among high school students in Jakarta. The evaluation was conducted by looking at the factor loading values, Variance Inflation Factor (VIF), Cronbach's alpha (CA), composite reliability (CR), and Average Variance Extracted (AVE) for each indicator. The following table presents the results of testing the measurement model for the four constructs.

Table 1 Reliability and Convergent Validity Testing

Variable	Item	Loading	VIF	CA	CR	AVE
Behavioral Intention to Use	BIU1	0.803	1.728	0.729	0.848	0.651
	BIU2	0.872	1.901			
	BIU3	0.740	1.245			
Perceived Ease of Use	PEU1	0.713	1.234	0.802	0.869	0.626
	PEU2	0.823	2.009			
	PEU3	0.835	2.131			
	PEU4	0.786	2.018			
Perceived Trust	PT1	0.805	1.716	0.816	0.879	0.645
	PT2	0.813	1.732			
	PT3	0.785	1.609			
	PT4	0.808	1.689			
Perceived Usefulness	PU1	0.838	1.558	0.744	0.854	0.662
	PU2	0.748	1.354			
	PU3	0.851	1.738			

The results in the table show that all indicators have loading values above 0.70 and low VIF, so it can be said that the statement items used sufficiently reflect each construct and do not face significant multicollinearity problems. Cronbach's alpha and composite reliability values for each variable are also above 0.70, with AVE exceeding 0.50, indicating that the instrument has good internal reliability and convergent validity in measuring the perceptions of ease, usefulness, trust, and intention of high school students in Jakarta to use AI as a learning medium. Thus, the four constructs are considered suitable for use in the structural model analysis stage to explain how AI is accepted as part of the learning system in secondary schools.

After the measurement model was declared to meet the criteria of reliability and validity, the next step was to analyze the structural model to see the extent to which students' perceptions of AI as a learning medium influenced their intention to use it. This analysis focuses on three main paths, namely the influence of Perceived Ease of Use, Perceived Usefulness, and Perceived Trust on Behavioral Intention to Use. The path coefficient values, bootstrap averages, standard deviations, t-values, and p-values for each relationship are shown in Table 2.

Table 2 Hypothesis Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Perceived Ease of Use -> Behavioral Intention to Use	0.184	0.19	0.106	1.733	0.083
Perceived Trust -> Behavioral Intention to Use	0.457	0.454	0.097	4.709	0.000
Perceived Usefulness -> Behavioral Intention to Use	0.243	0.239	0.092	2.651	0.008

In general, the results in Table 2 show that Perceived Trust and Perceived Usefulness have a positive and significant effect on Behavioral Intention to Use, while Perceived Ease of Use has a positive effect but is not statistically significant at the conventional significance level. These findings suggest that the willingness of high school students in Jakarta to utilize AI as a learning medium is determined more by the extent to which they perceive the technology to be useful and trustworthy, while the perception of ease of use plays a weaker role than the other two factors. A more detailed interpretation of the implications of each pathway will be discussed in the discussion section.

5. Discussion

H1 Perceived Ease of Use → Behavioral Intention to Use, the results show that Perceived Ease of Use has a positive but not yet statistically significant effect on Behavioral Intention to Use. This means that the easier AI is to understand and operate, the more likely high school students in Jakarta are to use it, but this ease is not a major determining factor compared to other constructs. This pattern is in line with several recent TAM studies on the relatively “digitally literate” younger generation, where ease is often considered standard and therefore no longer a key differentiator in the intention to use technology.

H2 Perceived Trust → Behavioral Intention to Use, for the second hypothesis, Perceived Trust has a positive and significant effect on Behavioral Intention to Use, with the strongest path coefficient among the three constructs. This finding confirms that students' willingness to use AI as a learning medium is highly dependent on the extent to which they believe that the AI system is reliable, secure, and does not harm them, both in terms of personal data and the quality of information provided. This is consistent with previous studies that place trust as a key factor in the acceptance of smart technologies and digital services, especially when users are still building their experience and understanding of AI capabilities.

H3 Perceived Usefulness → Behavioral Intention to Use The third hypothesis was also supported, whereby Perceived Usefulness had a positive and significant effect on Behavioral Intention to Use. Students who felt that AI could help them understand lesson material, speed up task completion, or improve learning achievement showed a higher intention to use AI continuously in their learning activities. This finding is in line with the core concept of TAM, which places usefulness as the main driver of technology use intention, and reinforces the results of other studies showing that educational technology including AI will be more readily accepted if students feel direct and concrete benefits to the learning process and outcomes.

The results of the study show that Perceived Trust and Perceived Usefulness play a more dominant role than Perceived Ease of Use in shaping Behavioral Intention to Use. Students seem to consider more whether AI really helps the learning process and whether the technology is trustworthy, rather than simply assessing whether AI is easy to use. This finding is consistent with various recent TAM studies that found that among young users who are already familiar with technology, ease of use tends to be considered a given, so that the intention to use is more determined by the perceived benefits and sense of security.

The significant influence of Perceived Usefulness indicates that AI is accepted when students feel a direct impact on their learning activities, such as understanding difficult material, speeding up task completion, or providing instant feedback. Meanwhile, Perceived Trust, which is the strongest predictor, emphasizes the importance of reliability, data security, and clarity of AI answer sources in the eyes of high school students. Conversely, the positive but not yet significant influence of Perceived Ease of Use shows that as long as AI is not perceived as “cumbersome,” ease of use alone is not enough to encourage usage without strong perceptions of usefulness and trust.

In practical terms, these results imply that schools and developers of AI-based learning media need to focus not only on user-friendly interfaces, but also on: (1) ensuring that AI provides real learning benefits that are easily perceived by students, and (2) building trust through transparency in how it works, content accuracy, and data protection. Teacher guidance in directing the critical and ethical use of AI is also important so that this technology truly becomes a learning tool, not just a “shortcut” to completing tasks.

6. Conclusion

This study concludes that high school students’ intention to use AI as a learning media in Jakarta is primarily shaped by how useful and how trustworthy they perceive the technology to be, while ease of use plays a positive but weaker role. The results refine Technology Acceptance Model applications by showing that, in AI-based learning contexts, trust must stand alongside perceived usefulness to adequately reflect students’ sensitivity to reliability, data security, and content quality. Practically, schools and EdTech developers need to ensure that AI demonstrably improves learning outcomes, communicates transparently how answers are generated, and protects student data and academic integrity, rather than focusing solely on user-friendly interfaces. Future studies should incorporate additional factors such as learner engagement, teacher support, and ethical awareness of AI, and adopt longitudinal or experimental designs to track how continued exposure to AI influences both acceptance and actual usage over time.

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Author Contributions (CRediT)

Fauzan Dwi Firmansyah: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Visualization, Writing – original draft, Supervision, Project administration. Muhammad Purnama Saddam: Writing – review & editing, Investigation, Formal analysis. All authors have read and approved the final version of this manuscript.

Conflicts of Interest

The authors declare no conflict of interest

Data Availability

The survey data and analysis code supporting the findings of this study are not publicly available due to privacy and ethical restrictions related to student participants. De-identified datasets and syntax files can be obtained from the corresponding author upon reasonable request for non-commercial academic purposes, subject to prior approval from the authors and compliance with institutional ethical guidelines. Any reuse of the data must include appropriate acknowledgment of the original study and may not attempt to re-identify individual participants.

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