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FACTORS INFLUENCING VOCATIONAL SCHOOL STUDENTS' BEHAVIOUR IN USING GENERATIVE AI: PERSPECTIVES FROM THE THEORY OF PLANNED BEHAVIOUR AND AI LITERACY

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis faktor-faktor yang memengaruhi perilaku siswa Sekolah Menengah Kejuruan (SMK) dalam menggunakan *Generative Artificial Intelligence* (GAI) berdasarkan perspektif *Theory of Planned Behavior* (TPB) dan literasi AI. Penelitian ini dilatarbelakangi oleh semakin meningkatnya pemanfaatan teknologi kecerdasan buatan dalam dunia pendidikan yang belum sepenuhnya diimbangi dengan pemahaman mengenai literasi AI serta etika penggunaannya. Penelitian menggunakan pendekatan kuantitatif dengan desain *explanatory research* melalui metode survei. Data dikumpulkan menggunakan kuesioner skala Likert terhadap 193 siswa Program Keahlian Manajemen Perkantoran di SMKN 1 Magetan Tahun Ajaran 2024/2025. Analisis data dilakukan menggunakan *Structural Equation Modeling–Generalized Structured Component Analysis* (SEM-GSCA) melalui aplikasi GSCA-Pro. Hasil penelitian menunjukkan bahwa literasi AI berpengaruh signifikan terhadap sikap siswa, dan sikap tersebut berpengaruh positif terhadap niat berperilaku dalam menggunakan *Generative AI*. Temuan ini mengindikasikan bahwa semakin tinggi tingkat literasi AI yang dimiliki siswa, semakin positif pula sikap dan niat mereka dalam memanfaatkan teknologi AI untuk mendukung proses pembelajaran. Penelitian ini menyimpulkan bahwa penguatan literasi AI perlu dilakukan untuk membentuk perilaku penggunaan AI yang bertanggung jawab di lingkungan pendidikan.

Kata kunci: *Generative Artificial Intelligence, Theory of Planned Behavior, Literasi AI, Sikap, Niat Berperilaku*

ABSTRACT

This study aims to analyse the factors influencing the behaviour of vocational high school (SMK) students in using Generative Artificial Intelligence (GAI) from the perspective of the Theory of Planned Behaviour (TPB) and AI literacy. The background to this study is based on the increasing use of AI technology in education, which has not yet been fully matched by an understanding of AI literacy and the ethics of its use. This study employs a quantitative approach with an explanatory research design using a survey method. Data were collected via a Likert-scale questionnaire from 193 students at SMKN 1 Magetan in the Office Management department for the 2024/2025 academic year. Data analysis was conducted using Structural Equation Modelling Generalised Structural Component Analysis (SEM-GSCA) via the GSCA-Pro application. The results indicate that AI literacy has a significant influence on students' attitudes, and these attitudes have a positive influence on behavioural intention regarding the use of Generative AI. These findings suggest that the higher the students' level of AI literacy, the more positive their attitudes and intentions are towards utilising AI technology to support

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the learning process. The conclusion of this study indicates that strengthening AI literacy is necessary to foster responsible AI usage behaviour within the educational environment.
Keywords: Generative AI, Theory of Planned Behavior, Literasi AI, Attitude, Behavioral Intention

INTRODUCTION

The rapid advancement of digital technologies has transformed educational practices worldwide, with Artificial Intelligence (AI) emerging as one of the most influential innovations in recent years. Among various AI developments, Generative Artificial Intelligence (GAI) has attracted considerable attention following the public release of ChatGPT by OpenAI in late 2022. Unlike conventional AI systems that primarily analyze existing data, GAI can generate new content, including text, images, videos, and computer code, based on user prompts. This capability has significantly expanded opportunities for teaching and learning by enabling personalized learning experiences, automated feedback, content creation, and interactive educational support. As a result, educational institutions across different levels have increasingly integrated GAI tools into learning activities to improve efficiency, accessibility, and student engagement (Ryazanov et al., 2024; Niraula, 2024; Wang et al., 2024). The growing accessibility of GAI technologies has also encouraged students to utilize AI-powered tools for academic tasks, making GAI an important component of contemporary digital learning environments.

The adoption of GAI is particularly relevant in vocational education, where learning outcomes are closely linked to practical competencies and workforce readiness. Vocational schools are expected to prepare students with technical expertise, problem-solving abilities, and digital skills that align with the demands of Industry 4.0 and Society 5.0. In this context, GAI can serve as a valuable learning resource by supporting project-based learning, assisting students in solving technical problems, generating ideas for innovation, and facilitating access to information related to their vocational fields. Furthermore, the integration of GAI into vocational education may contribute to the development of essential twenty-first-century competencies, including critical thinking, creativity, communication, and digital literacy. Given that future workplaces are increasingly incorporating AI technologies, vocational students need to develop the capacity to interact effectively and responsibly with AI systems. Therefore, understanding factors that influence students' acceptance and use of GAI has become increasingly important for vocational education institutions seeking to enhance learning quality and graduate competitiveness.

Despite its potential benefits, the increasing use of GAI in educational settings has also generated concerns regarding students' learning behavior. While GAI can facilitate learning and improve productivity, its inappropriate use may lead to negative academic consequences. Preliminary interviews conducted with students at SMKN 1 Magetan revealed that many students use GAI primarily to obtain instant answers rather than to support meaningful learning processes. Such practices may reduce opportunities for independent thinking, reflection, and knowledge construction. Moreover, excessive reliance on AI-generated content may encourage academic dishonesty, including plagiarism, unauthorized assistance, and the submission of work that does not genuinely reflect students' understanding. Previous studies have similarly reported challenges related to AI-assisted learning, such as technological dependency, diminished critical thinking, ethical concerns, and threats to academic integrity (Caduda & Barroso, 2024; Nikolic et al., 2025). These issues indicate that the educational benefits of GAI

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cannot be fully realized without a proper understanding of the factors influencing students' attitudes and behavioral intentions toward its use.

One theoretical framework that can explain technology adoption behavior is the Theory of Planned Behaviour (TPB), proposed by Ajzen (1991). TPB suggests that an individual's behavior is primarily determined by behavioral intention, which in turn is influenced by three key factors: attitude toward the behavior, subjective norms, and perceived behavioral control. Attitude refers to an individual's positive or negative evaluation of performing a particular behavior. Subjective norms represent perceived social pressure from significant others, such as teachers, peers, and family members, regarding whether the behavior should be performed. Perceived behavioral control reflects an individual's perception of the ease or difficulty of performing the behavior based on available resources, abilities, and opportunities. TPB has been widely applied in studies of technology acceptance because it provides a comprehensive explanation of how cognitive and social factors shape individuals' intentions and behaviors. In the context of GAI use, TPB can help explain why students choose to adopt AI technologies and how their beliefs and perceptions influence their willingness to use such tools in learning activities.

Among the factors that may influence students' attitudes and intentions toward GAI, AI literacy has emerged as a particularly important construct. AI literacy refers to the knowledge, skills, and competencies required to understand AI concepts, evaluate AI-generated outputs, interact effectively with AI systems, and recognize the ethical and social implications of AI use. Individuals with higher levels of AI literacy are generally better equipped to understand the capabilities and limitations of AI technologies, critically assess the accuracy of AI-generated information, and use AI responsibly in different contexts. In educational settings, AI literacy may help students avoid excessive dependence on AI tools while encouraging informed and ethical usage practices. Furthermore, AI literacy can strengthen students' confidence in using AI technologies, enhance their perceived usefulness of AI systems, and promote positive attitudes toward AI adoption. Consequently, AI literacy is increasingly recognized as a key competency for students navigating AI-enhanced learning environments.

Although previous studies have examined AI literacy and technology acceptance, empirical findings remain inconclusive. Several studies have reported that AI literacy positively influences attitudes toward AI and strengthens intentions to use AI technologies (Nguyen et al., 2024; Wang et al., 2025). These findings suggest that individuals with greater AI knowledge and competencies tend to exhibit more favorable perceptions of AI and are more willing to integrate it into their activities. However, other studies have found non-significant or inconsistent relationships between AI literacy and AI adoption behavior (Sergeeva et al., 2025; Borekci & Celik, 2024). Such inconsistencies indicate that the relationship between AI literacy and behavioral intention may vary across contexts, populations, and technological environments. Furthermore, most existing studies have focused on university students, educators, or professionals, while research involving vocational high school students remains limited, particularly in developing countries such as Indonesia. The limited evidence from vocational education contexts creates a significant research gap because vocational students possess unique educational characteristics and learning needs that may influence their interaction with GAI technologies. Therefore, further investigation is necessary to clarify the role of AI literacy in shaping attitudes and behavioral intentions toward GAI use among vocational students.

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Based on the theoretical and empirical gaps identified above, this study aims to analyze the influence of AI literacy on students' attitudes and behavioral intentions toward the use of Generative Artificial Intelligence from the perspective of the Theory of Planned Behaviour. Specifically, this study seeks to examine whether AI literacy contributes to the formation of positive attitudes toward GAI and whether these attitudes subsequently influence students' intentions to use GAI in learning activities. By focusing on vocational high school students at SMKN 1 Magetan, this research is expected to contribute to the growing literature on AI adoption in education while providing practical insights for educators and policymakers in developing strategies to promote responsible, ethical, and effective use of Generative AI within vocational education environments.

RESEARCH METHODS

This study employed a quantitative explanatory research design to examine the influence of AI literacy on students' attitudes and behavioral intentions toward the use of Generative Artificial Intelligence (GAI). Explanatory research is designed to explain causal relationships among variables and test hypotheses regarding those relationships (Creswell, 2012). The research was conducted at SMKN 1 Magetan, East Java, Indonesia. The participants consisted of 193 students from the Office Management Programme (Manajemen Perkantoran) of the 2025 cohort. All eligible students were included in the study using a census approach, allowing comprehensive data collection from the target population.

The study utilized both primary and secondary data sources. Primary data were collected through an online questionnaire distributed via Google Forms. The questionnaire employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure students' perceptions regarding AI literacy, attitudes toward GAI, and behavioral intentions to use GAI. The Likert scale is widely used to assess attitudes, perceptions, and opinions toward a particular phenomenon (Sugiyono, 2023). Secondary data were obtained from books, scientific journals, and previous research reports relevant to artificial intelligence and educational technology (Siddiqui, 2019).

The research instrument consisted of 16 statement items designed to measure AI literacy, attitude, and behavioral intention. Prior to further analysis, the instrument was subjected to validity and reliability testing. The validity test indicated that 15 out of 16 items met the required criteria, with item-total correlation values ≥ 0.30 and significance values (p-values) ≤ 0.05. One item (KP13) was found to be invalid and was therefore excluded from subsequent analyses. Reliability testing using Cronbach's Alpha produced a coefficient of 0.861, indicating a high level of reliability and confirming that the instrument was suitable for data collection and analysis.

Data analysis was conducted in several stages. First, descriptive statistical analysis was used to describe respondents' demographic characteristics, including gender and age distribution. The results showed that the majority of respondents were female (98.45%) and aged between 15 and 16 years (73.8%). Second, validity and reliability analyses were performed to ensure the quality of the measurement instrument. Third, inferential statistical analysis was conducted to examine the influence of AI literacy on attitudes and behavioral intentions toward the use of Generative AI. The results were then interpreted to explain the relationships among the variables and to address the objectives of the study.

RESULTS AND DISCUSSION

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This study involved 193 respondents students from the Office Management programme at SMKN 1 Magetan, cohort 2025 to examine the influence of AI literacy (exogenous variable) on attitude, behavioural intention, and generative AI (endogenous variables). The majority of respondents were female (98.45%) aged 15 - 16 years (73.8%). The validity test showed that 15 out of 16 items met the criteria (item-total correlation ≥ 0.30, P-value ≤ 0.05) only item KP13 was invalid. The reliability test yielded a Cronbach's Alpha of 0.861 (high category), meaning the instrument was deemed suitable and reliable for further analysis.

Result

The measurement model can be assessed using indicators of loading, Cronbach's alpha, rho, PVE, dimensionality, component validity, and R-squared. Based on the results of the loading indicators assessment, it was found that most indicators met the minimum threshold of ≥ 0.5 - 0.6 (Chin, 1998). However, indicators such as AT4, AT5, and LAI5 had values below the threshold and were therefore removed. The indicators with the highest values include AT2 (0.938) for the Attitude variable, BI2 (0.904) for Behavioural Intention, LAI2 (0.817) for AI Literacy, and GAI3 (0.763) for Generative AI.

Tabel 1. Indicator of Loading Assessment

Loadings				
	Estimate	SE	95%CI(L)	95%CI(U)
GAI				
GAI1	0.639	0.060	0.515	0.752
GAI2	0.738	0.042	0.647	0.822
GAI3	0.768	0.041	0.683	0.844
AT				
AT1	0.810	0.039	0.715	0.879
AT2	0.905	0.014	0.873	0.927
AT3	0.728	0.035	0.642	0.783
AT4	0.404	0.081	0.232	0.542
AT5	0.297	0.086	0.105	0.466
BI				
BI1	0.655	0.048	0.554	0.733
BI2	0.893	0.014	0.864	0.916
BI3	0.747	0.033	0.667	0.805
LAI				
LAI1	0.698	0.053	0.605	0.794
LAI2	0.813	0.030	0.753	0.874
LAI3	0.543	0.067	0.400	0.647
LAI4	0.573	0.094	0.353	0.711
LAI5	0.093	0.145	-0.172	0.353

According to (Hair et al., 2019), an evaluation of construct quality measures is necessary to ensure that the research model meets the criteria for convergent validity, internal consistency, and composite reliability. A construct is said to have good convergent validity if the PVE value is ≥ 0.50, in line with (Ali et al., 2021), who state that Cronbach's Alpha and Composite Reliability (rho) > 0.70 are considered good. Meanwhile, according to (Meneau, 2022),

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dimensionality is considered good if the value is 1.0, indicating that the construct's indicators lie on a single consistent latent dimension.

Based on Table 2, the PVE values for the GAI, AT, and BI variables are acceptable, whilst the LAI does not meet the minimum threshold and is therefore not yet convergent valid. Cronbach's Alpha values are met only for the AT variable, whilst GAI, BI, and LAI fall below the threshold and are therefore not yet internally consistent. However, the Composite Reliability (rho) values for all four variables are deemed to meet the criteria, and the dimensionality values for all variables stand at 1, which is still well within acceptable limits.

Tabel 2. Construct Quality Measures

Construct quality measures				
	GAI	AT	BI	LAI
PVE	0.515	0.703	0.594	0.443
Alpha	0.53	0.783	0.667	0.573
rho	0.76	0.875	0.811	0.755
Dimensionality	1	1	1	1

Discriminant validity was tested using the Fornell Larcker criterion, whereby a construct is deemed valid if its √AVE value is higher than its correlation with other constructs (Fornell & Larcler, 1981). The results of the analysis indicate that the GAI and LAI constructs meet this criterion, meaning that their indicators are capable of distinguishing between the concepts being measured. Conversely, the AT and BI constructs do not meet the criteria because the √AVE value is lower than their correlation, indicating that both have a very strong relationship and tend to measure almost identical aspects.

According to (Ali et al., 2021), the HTMT ratio is considered good if it is ≤ 0.90. Based on Table 3, the discriminant validity of most HTMT values for the research constructs is still acceptable.

Tabel 3. Component Validity Assessment

Fornell-Larcker criterion values				
	GAI	AT	BI	LAI
GAI	0.717			
AT	0.415	0.838		
BI	0.494	0.958	0.77	
LAI	0.398	0.265	0.292	0.666
HTMT				
	Estimate	SE	95%CI(L)	95%CI(U)
GAI <-> AT	0.625	0.093	0.452	0.844
GAI <-> BI	0.863	0.098	0.668	1.087
GAI <-> LAI	0.674	0.12	0.424	0.953
AT <-> BI	1.243	0.037	1.179	1.347
AT <-> LAI	0.349	0.095	0.12	0.511
BI <-> LAI	0.455	0.102	0.195	0.647

The R-squared test indicates the predictive power of the structural model, with a GAI value of 0.159 (15.9% explained by exogenous variables, 84.1% by external factors), AT of 0.184 (18.4% influenced by exogenous variables, 81.6% by external factors), and BI of 0.929

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(92.9% influenced by exogenous variables, 7.1% by external factors). Meanwhile, LAI is not influenced by other variables as it acts as an exogenous variable. In the structural model assessment test, the FIT result of 0.499 indicates that the model explains 49.9% of the data variation, AFIT of 0.492 (49.2%), FITs of 0.318 (31.8% of the structural model variance), and FITm of 0.554 (55.4% of the measurement model variance). According to (Hwang et al., 2021), for samples >100, GFI ≥ 0.93 and SRMR < 0.09; the GFI (0.951) and SRMR (0.089) values in this study meet these criteria.

According to (Hwang et al., 2021), a path coefficient is considered significant if it falls within the 95% confidence interval and is positive or has no negative values. The results of the hypothesis testing were as follows: AT→BI was 0.909 (CI 0.872–0.937, H1 accepted); LAI→AT was 0.118 (CI -0.009–0.241, H2 rejected); LAI→BI was 0.005 (CI -0.034–0.042, H3 rejected); LAI→GAI was 0.398 (CI 0.282–0.551, H4 accepted); GAI→BI was 0.114 (CI 0.073–0.163, H5 accepted); and GAI→AT was 0.368 (CI 0.262–0.508, H6 accepted).

Discussion

The findings reveal that attitude has a strong and significant influence on behavioural intention to use Generative Artificial Intelligence (GAI) (β = 0.909). This result indicates that students who perceive GAI positively are more likely to intend to use the technology in their learning activities. From the perspective of technology acceptance theories, attitude reflects an individual's overall evaluation of a technology, encompassing perceptions of usefulness, convenience, and expected outcomes. When students believe that GAI can facilitate learning, accelerate task completion, and improve academic performance, they tend to develop stronger intentions to continue using it. The exceptionally high coefficient suggests that attitude is the most influential determinant of behavioural intention in this study. This finding supports previous studies by Sugandini (2022) and Or (2023), which identified attitude as a critical predictor of educational technology adoption. It also aligns with the Theory of Planned Behaviour, which posits that favourable attitudes toward a behaviour increase the likelihood of forming intentions to perform that behaviour. In the context of vocational education, where students frequently engage in practical assignments and project-based learning, positive experiences with GAI may strengthen perceptions of its usefulness and consequently increase intentions to use it in future learning activities.

Interestingly, AI literacy does not significantly influence attitude toward GAI (β = 0.118). This finding suggests that possessing knowledge about AI does not necessarily lead students to develop positive evaluations of the technology. One possible explanation is that vocational students may primarily view GAI as a practical tool rather than a technological innovation that requires deep conceptual understanding. In other words, students can form favourable or unfavourable attitudes based on their direct experiences using GAI regardless of their level of AI literacy. This result supports the findings of Reyes et al. (2024) and Kulla et al. (2025), who reported that technological literacy alone is insufficient to shape attitudes unless accompanied by meaningful learning experiences, critical reflection, and contextual application. The finding further suggests that attitudes toward GAI may be influenced more strongly by perceived usefulness, ease of use, peer influence, and learning outcomes than by technical knowledge of AI itself. Therefore, educational interventions aimed solely at increasing AI literacy may not automatically foster more positive attitudes toward GAI unless they also provide opportunities for students to experience its educational benefits directly.

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Similarly, AI literacy does not have a significant direct effect on behavioural intention (β = 0.005). This finding indicates that understanding AI concepts, capabilities, and limitations is not enough to encourage students to use GAI in their learning activities. The result implies that the relationship between AI literacy and behavioural intention may operate indirectly through other psychological or contextual factors. Students may understand how AI works and recognize its potential benefits, yet still choose not to use it if they perceive limited usefulness, encounter difficulties integrating it into their learning processes, or receive insufficient encouragement from teachers and peers. This interpretation is consistent with Qi et al. (2025), who found that AI literacy primarily affects performance expectancy, effort expectancy, and social influence rather than directly influencing behavioural intention. Likewise, Borekci and Celik (2024) demonstrated that the effect of digital literacy on usage intention is often mediated by perceived usefulness and perceived ease of use. These findings suggest that AI literacy functions as a foundational competency rather than a direct motivational factor. Consequently, schools should complement AI literacy programmes with pedagogical strategies that demonstrate the practical value of GAI in supporting academic achievement and learning effectiveness.

In contrast, AI literacy significantly influences the use of Generative AI (β = 0.398). This result suggests that students with higher levels of AI literacy are more capable of utilizing GAI in their educational activities. AI-literate students are likely to possess better prompt-writing skills, stronger abilities to evaluate AI-generated outputs, and greater awareness of ethical considerations associated with AI use. As a result, they can interact with GAI more effectively and confidently. This finding is consistent with Al-abdullatif (2024), who identified AI literacy as a major determinant of Generative AI adoption in educational settings. Similarly, Soylu et al. (2025) found that AI literacy enhances engagement, usability, and learning effectiveness when interacting with AI-based systems. In the context of vocational education, AI literacy may serve as an enabling factor that helps students integrate GAI into practical learning activities, such as report writing, information searching, problem-solving, and project development. Therefore, strengthening AI literacy remains important because it directly contributes to students' actual use of GAI, even though it does not directly shape their attitudes or behavioural intentions.

The study also found that the use of Generative AI significantly influences behavioural intention (β = 0.114). This result suggests that students who actively use GAI are more likely to continue using it in the future. Positive usage experiences can increase students' confidence in the technology and reinforce perceptions of its value for academic tasks. Repeated interaction with GAI may also reduce uncertainty and increase familiarity, making future adoption more likely. This finding is supported by Poudel and Bastakoti (2024), who reported that students' intentions to use AI technologies are strengthened by positive experiences and favourable performance expectations. Similarly, Nasiru et al. (2025) found that perceived usefulness, ease of use, and social influence contribute significantly to students' intentions to continue using content-generative AI tools. The result indicates that actual interaction with GAI plays an important role in transforming curiosity into sustained behavioural intention, highlighting the importance of providing students with opportunities to use AI in authentic learning contexts.

Furthermore, Generative AI significantly affects students' attitudes toward AI use (β = 0.368). This finding suggests that direct experience with GAI contributes to the formation of positive perceptions regarding the technology. Students who experience benefits such as faster information retrieval, improved learning efficiency, and assistance in completing assignments

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are more likely to develop favourable attitudes toward GAI. This relationship highlights the experiential nature of technology acceptance, where attitudes are shaped not only by prior beliefs but also by actual interactions with the technology. The finding is consistent with Binjwair and Alamer (2025), who found that positive experiences with Generative AI significantly influence users' attitudes and subsequent adoption behaviours. Likewise, Ittefaq and Zain (2025) emphasized that attitude acts as an important mediator linking technological perceptions, trust, and literacy to behavioural outcomes. In the present study, the significant influence of GAI on attitude indicates that students' perceptions are largely formed through practical engagement rather than theoretical understanding alone.

Overall, the findings demonstrate that attitude serves as the most important determinant of behavioural intention, whereas AI literacy primarily influences actual GAI use rather than directly affecting attitudes or intentions. These results suggest that promoting responsible and sustainable adoption of Generative AI in vocational education requires more than simply improving students' AI knowledge. Educational institutions should provide meaningful opportunities for students to interact with GAI, develop positive learning experiences, and understand how AI can support academic and professional development. Such an approach may foster favourable attitudes, encourage continued use, and ultimately support the effective integration of AI technologies into vocational education.

CONCLUSION

This study shows that vocational school students' behaviour in using Generative AI is influenced by a combination of psychological factors and technological competencies that do not always have a direct effect. Attitude is the strongest factor in shaping behavioural intention, confirming that acceptance and positive experiences with the technology play a greater role than technical ability. Meanwhile, AI literacy does not have a direct influence on either attitude or behavioural intention, indicating that technical understanding alone is not sufficient to shape students' perspectives. However, AI literacy does have a tangible influence on the use of Generative AI, meaning that literacy remains a crucial foundation for the appropriate and responsible use of technology. Generative AI itself has a significant influence on Attitude and Behavioural Intention; the more frequently students interact with it, the more positive their attitudes and their desire to continue utilising it in their learning. Further research is recommended to expand the model to include social variables, broaden the scope of the study to other schools or educational levels, and develop AI literacy instruments and alternative analytical methods such as SEM-PLS to improve the model's generalisation and accuracy.

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