



Mapping AI Literacy and Motivation Trends among College Students in Southeast Asia

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ABSTRACT

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Artificial Intelligence (AI) is reshaping higher education across the globe. However, questions remain on how students are prepared and motivated to adopt AI tools in Southeast Asia. This paper studies the relationship between AI literacy and student motivation, focusing on the cultural and contextual factors that shape adoption and role of ethical awareness. Using an integrative review of peer-reviewed studies and policy reports published between 2018 and 2025, the research brings together regional evidence to

highlight emerging patterns and gaps. Results show that students with stronger AI literacy are generally more motivated to use AI in learning, though this



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relationship is influenced by socio-economic background, institutional resources, and national digital infrastructure. Learners in digitally advanced countries display higher adoption rates, while those in resource-constrained settings face challenges that widen equity gaps. Ethical awareness also plays a critical role when paired with supportive institutional policies as it strengthens motivation and encourages responsible use. The study argues that comprehensive literacy programs, equity-focused initiatives, and ethics-driven curricula are vital for preparing Southeast Asian students to meet the demands of the Fourth Industrial Revolution. By mapping regional trends and pinpointing areas that need attention, this review offers insights that can guide policy, curriculum design, and institutional strategies toward more inclusive and ethical AI integration.

INTRODUCTION

Artificial Intelligence (AI) has already transitioned from being an innovation to becoming a powerful instrument in education, transforming the ways students learn, interact, and prepare for their future careers. In Southeast Asia, universities are continuously adopting AI tools, ranging from different generative platforms to adaptive learning systems and intelligent tutoring applications to enrich teaching and learning. These technologies offer more personalized learning experiences, stronger student engagement, and improved academic performance. As a result, AI literacy is emerging as a vital skill for students who must navigate the demands of the Fourth Industrial Revolution (Nguyen, 2025; Salleh et al., 2025). But, despite the global enthusiasm for AI, there are still unanswered questions about how prepared and motivated Southeast Asian students truly are, especially when cultural and infrastructural realities are considered.

Being an AI literate no longer confines within the boundary of just how to navigate. It includes the ability to understand, apply, evaluate, and even create AI solutions responsibly, while considering ethical and societal implications (Kong et al., 2025). Motivation, meanwhile, is a critical driver of technology adoption. This shapes whether students are willing to engage with AI tools and develop related competencies. Studies suggest that both intrinsic factors, such as curiosity and career relevance, and extrinsic influences, like institutional support and peer encouragement, play a role in shaping student engagement (Salleh et al., 2025; Keong, 2025). However, much of the existing research looks only at technical adoption, leaving behavioral and attitudinal dimensions underexplored.

AI-related educational research has been popular since the expanded availability of generative AI tools in 2022. Many of these studies highlight positive links between AI literacy and academic outcomes, with self-efficacy often

acting as a mediator in motivational pathways (Guo & Li, 2025; Kong et al., 2025). Still, findings are mixed when it comes to how motivation influences cognitive performance, pointing to other mediating variables such as prior digital experience and socio-economic status (Nagya et al., 2024). Despite the ease access in theories and knowledge for the vast application of AI, ethical awareness is still a distinct aspect to be factored in as part of AI literacy, but few studies examine how it interacts with motivation to shape adoption behaviors (Henadirage & Gunarathne, 2025).

Across Southeast Asia, AI adoption in higher education shows uneven progress. Countries like Singapore and Malaysia are leading, supported by national strategies and institutional investments, while Cambodia and Laos continue to face infrastructural and policy challenges (Pannen et al., 2025; Hananto, 2025). Regional initiatives stress the importance of capacity building, governance frameworks, and curriculum integration, but evidence at the student level remains limited. This gap makes it difficult to fully understand how cultural, economic, and institutional contexts influence adoption behaviors.

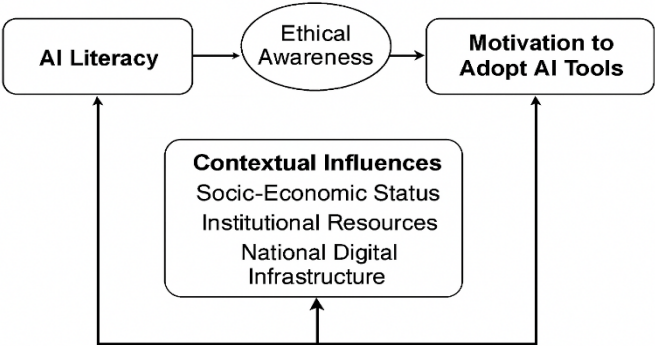
Attitudes toward AI are generally positive. Students recognize its potential to improve learning and employability (Homer et al., 2025; Keong, 2025). Yet actual usage varies widely. For example, 86% of Singaporean students report regular use of generative AI tools, compared to only about 42% in Indonesia and Vietnam (Hananto, 2025). These differences highlight deeper issues of preparedness and motivation, often tied to infrastructure, the absence of formal literacy programs, and limited ethical training (Salleh et al., 2025; Nagya et al., 2024).

The demographics of users also influence the differences in AI adaptation and utilization. Gender, academic discipline, and year level influence both literacy and motivation. Male students and those in technology-related fields often report higher proficiency and confidence compared to female students and those in non-technical programs (Asio, 2024; Mansoor et al., 2024). Yet, few studies explore how these demographic factors intersect with motivational drivers, leaving important socio-cultural dynamics unexplored.

AI Literature points to three major gaps. First, there is little synthesis of regional trends in AI literacy and motivation, limiting comparative insights across Southeast Asia. Second, cultural and contextual factors remain underexamined, these leave questions about how socio-economic conditions, institutional resources, and national digital strategies shape adoption. Third, there is no integrated framework that connects literacy, motivation, and ethical awareness, resulting in fragmented approaches that overlook the interplay between technical competence, behavioral drivers, and responsible use. Addressing these gaps is crucial if Southeast Asian higher education is to avoid widening digital divides

and ensure graduates are equipped with the competencies needed for the future workforce.

In response, this study intends to: (1) examine the relationship between AI literacy and student motivation to adopt AI tools in learning; (2) analyze how cultural and contextual factors—such as socio-economic status, institutional type, and national digital infrastructure—influence this relationship; and (3) assess how ethical awareness and responsible AI use moderate the link between literacy and motivation. By synthesizing regional evidence, the review aims to inform policy development, curriculum design, and institutional strategies that support responsible and inclusive AI integration in Southeast Asian higher education.



FRAMEWORK

Figure 1. Conceptual Framework

This study is grounded in a conceptual framework that maps how AI literacy influences students’ motivation to adopt AI tools in higher education. As illustrated in Figure 1, AI literacy is treated as the central predictor of motivation, encompassing not only technical proficiency but also critical thinking and ethical understanding. Students who are more literate in AI are generally more confident and willing to integrate these tools into their learning.

At the same time, ethical awareness is placed as a moderating factor. When students are guided by a clear understanding of responsible AI use acknowledging inherent issues such as bias, privacy, and academic integrity, their motivation to adopt AI tools is strengthened. Ethical readiness ensures that adoption is not only enthusiastic but also responsible.

The framework also recognizes the importance of contextual influences. Socio-economic status, institutional resources, and national digital infrastructure shape both literacy and motivation, determining whether students can move from

conceptual understanding to actual usage. In resource-constrained environments, even highly literate students may struggle to adopt AI tools effectively.

By integrating behavioral, ethical, and structural dimensions, this framework provides a holistic lens for analyzing AI adoption trends in Southeast Asian higher education. It highlights that literacy alone is not enough—motivation is amplified when ethics and enabling contexts are in place, ensuring adoption that is both equitable and responsible.

OBJECTIVES OF THE STUDY

This study aims to explore the relationship between AI literacy and motivation in adopting AI tools among college students in Southeast Asia. Specifically, it seeks to: (1) Determine whether higher levels of AI literacy among Southeast Asian college students are associated with stronger motivation to adopt AI tools in learning; (2) Examine how cultural and contextual factors, such as socio-economic status, institutional type, and national digital infrastructure, influence the relationship between AI literacy and motivation for AI adoption; and (3) Assess the moderating effect of ethical awareness and understanding of responsible AI use on the relationship between AI literacy and motivation among college students in Southeast Asia.

METHODOLOGY

This study adopts an integrative literature review approach, designed to incorporate existing research, generate new perspectives, identify gaps, and propose a conceptual framework (Whittemore & Knafl, 2005; Torraco, 2005). Different from traditional narrative reviews that are largely descriptive, an integrative review combines both theoretical and empirical studies, offering a comprehensive view for understanding complex phenomena such as AI literacy and motivation in Southeast Asian higher education. The process followed five systematic stages: problem identification, literature search, data evaluation, data analysis, and synthesis.



Figure 2. Research Methodology

Problem Identification

Firstly, problems and objectives should be clearly defined. This review focuses on mapping trends in AI literacy and motivation among college students in Southeast Asia, examining cultural and contextual influences, and exploring the moderating role of ethical awareness. Establishing these parameters ensured that the review remained aligned with the research questions and hypotheses (Torraco, 2005). The scope covered peer-reviewed articles, conference papers, and policy reports published between 2018 and 2025, reflecting the surge in AI adoption following the introduction of generative AI tools.

Literature Search

A comprehensive search strategy was employed across Google Scholar, Scopus, Web of Science, and ERIC to ensure broad coverage. Keywords included AI literacy, student motivation, higher education, Southeast Asia, Philippines, ethical AI use, and technology adoption in education. Boolean operators (AND, OR) and truncation were applied to refine results.

- *Inclusion criteria:* studies focusing on AI adoption in higher education; research addressing literacy, motivation, or ethical awareness; studies conducted in Southeast Asia or offering comparative insights relevant to the region.
- *Exclusion criteria:* non-English publications, studies outside the education domain, and articles lacking empirical or theoretical rigor. This systematic approach aligns with established guidelines for high-quality reviews (Okoli, 2015).

Data Evaluation

The selected studies were assessed for quality and relevance through a two-step screening process:

- Title and abstract screening to remove irrelevant sources.
- Full-text review to confirm alignment with research objectives. Quality appraisal was guided by Whittemore & Knafl (2005), focusing on methodological rigor, clarity of findings, and contribution to the field. Studies were then grouped into thematic clusters: AI literacy, motivation, cultural/contextual factors, and ethical considerations. This ensured that only credible and relevant evidence informed the synthesis.

Data Analysis

Data analysis follows a narrative synthesis approach, integrating findings across qualitative, quantitative, and mixed-method studies. Thematic coding was applied to extract key concepts, patterns, and relationships. For instance, studies were examined to determine how AI literacy correlates with motivation, how socio-economic and institutional factors shape adoption behaviors, and how ethical awareness influences student engagement. Cross-country comparisons were also made to identify regional similarities and differences (Koerber et al., 2023). Conceptual mapping techniques were used to visualize relationships among variables, supporting the development of the proposed framework.

Synthesis and Reporting

The final stage involves correlating findings into a coherent narrative that addressed the research objectives and hypotheses. The synthesis highlighted three major gaps: (1) limited regional trend analysis, (2) insufficient exploration of cultural and contextual influences, and (3) lack of integrated frameworks linking literacy, motivation, and ethics. Recommendations for future research and policy interventions emphasized curriculum integration, faculty development, and ethical AI education. Transparency was maintained by documenting the search strategy, inclusion/exclusion criteria, and analytical procedures, ensuring replicability and credibility (Okoli, 2015; Whittemore & Knafl, 2005).

Ethical Considerations

Although this study did not involve human participants, ethical standards were upheld by accurately representing sources, avoiding plagiarism, and ensuring proper citation of all reviewed literature. The review process adhered to best practices for scholarly integrity in secondary research. In addition, the authors acknowledge the use of artificial intelligence (AI) assistance in enhancing the clarity, organization, and readability of the manuscript. All AI-supported contributions were critically reviewed, revised, and validated by the authors to ensure accuracy, originality, and compliance with institutional and publication standards.

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and compliance with institutional and publication standards.

RESULTS AND DISCUSSION

Artificial Intelligence (AI) is no longer a niche innovation—it has become a powerful force in higher education, reshaping classrooms and redefining how students learn, interact, and build skills for the future. In Southeast Asia, universities are steadily weaving AI tools into their teaching practices, from generative platforms to adaptive learning systems and intelligent tutoring applications. These technologies promise more personalized learning experiences, stronger student engagement, and improved academic performance. As a result, AI literacy is emerging as a core competency for students preparing to meet the challenges of the Fourth Industrial Revolution (Chiu et al., 2023; Laupichler, 2022).

Yet, despite the global enthusiasm surrounding AI, important questions remain. How prepared are Southeast Asian students to adopt these tools, and what motivates them to do so? Current discourse often highlights the benefits of AI integration but pays less attention to the socio-cultural and infrastructural realities of the region. In particular, the Philippines and other resource-constrained contexts face unique challenges that shape both readiness and motivation, underscoring the need for deeper investigation.

AI Literacy and Motivation

AI literacy is more than just technical know-how. It also combines proficiency with critical thinking and ethical awareness (Bećirović et al., 2025). Research consistently shows that students with stronger AI literacy feel more confident and are more willing to integrate AI tools into their academic work, which in turn boosts their motivation (Obenza et al., 2024; Silitonga et al., 2023). Theoretical models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) reinforce this connection: both highlight perceived ease of use and perceived usefulness—factors shaped by literacy—as powerful predictors of adoption (Davis, 1989; Venkatesh et al., 2003).

Evidence from the Philippines illustrates this link clearly. Obenza et al. (2024) found that college students' AI literacy strongly influenced their attitudes toward generative AI tools like ChatGPT, with trust and self-efficacy acting as mediators. Sumilong (2025) reported similar findings, noting that students in classrooms where AI use was permitted showed higher motivation and engagement compared to those in more restrictive settings. These results suggest that literacy,

when paired with supportive institutional policies, creates fertile ground for adoption. In Indonesia, Silitonga et al. (2023) observed that chatbot-based learning improved student motivation, further underscoring how literacy and motivation reinforce one another across different contexts. This finding supports the argument that AI literacy is closely tied to student motivation and adoption behaviors.

Still, disparities remain. Mansoor et al. (2024) highlighted that students in technology-related programs tend to report higher AI literacy and stronger motivation compared to peers in non-technical fields. This points to a pressing need for institutions to design strategies that close gaps across disciplines and demographics, ensuring that all students—not just those in tech-focused programs—develop the literacy and confidence needed to engage meaningfully with AI.

Cultural and Contextual Factors

Cultural and contextual factors strongly shape how students in Southeast Asia adopt and engage with AI. In countries such as Singapore and Malaysia, where digital infrastructure is robust and national AI strategies are firmly in place, student engagement with AI tools is noticeably higher. By contrast, nations like Cambodia and Laos, which face infrastructural and policy limitations, report slower progress in adoption (Hananto, 2025; Pannen et al., 2025). Institutional type also plays a role: private universities in urban centers often provide greater access to AI resources, giving their students an advantage in both literacy and motivation (Co, 2025).

Socio-economic status adds another layer of complexity. Students from resource-constrained backgrounds frequently encounter barriers such as limited access to devices and unreliable internet connectivity. These challenges undermine both literacy and motivation, making it difficult for students to fully benefit from AI integration (Avila et al., 2021). The Philippines offers a clear example of this issue, where persistent urban-rural divides and affordability concerns continue to limit opportunities for many learners (World Bank Group, 2025). Even students with strong literacy skills may struggle to stay motivated when infrastructural constraints make AI tools slow, inconsistent, or inaccessible.

Taken together, these findings highlight the urgent need for equity-focused interventions. Addressing disparities across regions, institutions, and socio-economic groups is essential to ensure that AI adoption in Southeast Asian higher education is not only widespread but also inclusive and sustainable.

Ethical Awareness as a Moderator

Ethical awareness is increasingly recognized as a vital dimension of AI literacy. As Ligot (2024) notes, responsible AI use, covering issues such as bias, privacy, and academic integrity, can boost students' confidence and willingness to adopt AI tools. In the Philippines, research shows that while students are eager to experiment with AI, their grasp of ethical implications is often limited, raising concerns about misuse and academic dishonesty (Obenza et al., 2024). Embedding ethics into AI education not only strengthens literacy but also nurtures intrinsic motivation by connecting technology use with personal values and broader societal responsibilities (Chiu et al., 2023).

Evidence further suggests that ethical awareness acts as a moderator, amplifying the positive effects of literacy on motivation when supported by clear institutional policies. Classroom studies in the Philippines demonstrate that policies promoting responsible AI use and offering scaffolds encourage constructive adoption and higher motivation. In contrast, restrictive or ambiguous rules can suppress engagement or drive students toward covert misuse (Sumilong, 2025). At the same time, heightened ethical concerns without supportive guidance may discourage adoption altogether, showing that ethics strengthen motivation only under enabling conditions (Fu & Weng, 2024; Zhai et al., 2024).

Taken together, the findings highlight that AI literacy alone is not enough. For adoption to be both motivated and responsible, literacy must be supported by contextual factors and ethical frameworks. In Southeast Asia, and especially in the Philippines, policy and practice should therefore prioritize comprehensive literacy programs, equitable infrastructure, and ethics integration. Doing so will ensure that students are not only technically competent but also confident and motivated to use AI tools in ways that align with academic integrity and social responsibility.

CONCLUSION

The synthesis of evidence provides strong support for the three hypotheses and offers important insights into AI adoption in Southeast Asian higher education. First, AI literacy emerges as a powerful predictor of motivation. Students who demonstrate higher levels of literacy, combining technical proficiency, critical thinking, and ethical awareness, are more confident and more willing to integrate AI tools into their academic work. This finding is consistent with theoretical models such as TAM and UTAUT, which emphasize perceived ease of use and perceived usefulness as drivers of adoption. Empirical studies from Southeast Asia and the Philippines reinforce this link, showing that literacy enhances both

perceived usefulness and self-efficacy, which in turn fuel motivation (Obenza et al., 2024; Silitonga et al., 2023).

Second, cultural and contextual factors significantly shape how literacy translates into motivated adoption. Socio-economic status, institutional type, and national digital infrastructure determine whether students can move from conceptual understanding to actual usage. In resource-constrained settings, limited access to devices and unreliable connectivity often undermine motivation, even among students who are otherwise literate in AI (Avila et al., 2021; World Bank Group, 2025). These disparities highlight the importance of equity-focused strategies that address infrastructural and institutional gaps.

At the same time, two critical gaps remain in the literature. The first is the scarcity of comparative and longitudinal studies across Southeast Asian countries. Without these, it is difficult to fully understand how national policies, cultural norms, and infrastructural differences shape adoption behaviors over time. The second gap concerns the moderating role of ethical awareness. While existing evidence suggests that ethics can strengthen motivation when paired with supportive policies, empirical tests of this conditional effect are limited. The interplay between ethical awareness and institutional guidance therefore requires deeper investigation to clarify how responsible AI use can be embedded into student adoption pathways.

RECOMMENDATIONS

Future research should expand beyond single-country case studies to include cross-country and longitudinal analyses, allowing scholars to track how AI literacy and motivation evolve over time and across diverse Southeast Asian contexts. Such comparative work would provide valuable insights into equity gaps and the effectiveness of national and institutional policies.

Methodologically, researchers are encouraged to employ advanced statistical techniques, such as moderated mediation models, to explore how ethical awareness interacts with institutional policies and socio-economic conditions in shaping the literacy-motivation relationship. This would clarify the conditional pathways through which ethics and context influence adoption behaviors.

Finally, mixed-method approaches that combine large-scale surveys with qualitative interviews can capture the nuanced cultural and ethical dynamics often missed in purely quantitative studies. By grounding interventions in both statistical evidence and lived student experiences, future research can ensure that recommendations are not only rigorous but also contextually relevant and responsive to the realities of Southeast Asian higher education.

TRANSLATIONAL RESEARCH

This study's findings can be translated into practice by developing AI literacy curricula that integrate ethics and equity considerations. Pilot programs in Southeast Asian universities can test the effectiveness of these modules, with results informing institutional policies and national strategies. In this way, the review moves beyond theory to practical interventions that prepare students for responsible AI adoption.

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