

FACTORS INFLUENCING UNIVERSITY STUDENTS' ACCEPTANCE OF ARTIFICIAL INTELLIGENCE FOR LEARNING**FAKTOR-FAKTOR YANG MEMPENGARUHI PENERIMAAN KECERDASAN BUATAN UNTUK PEMBELAJARAN OLEH MAHASISWA UNIVERSITAS****Yakobus Nahak**

STKIP Surya Kasih Kefamenanu

*nahakyakobus65@gmail.com

Corresponding Author*ABSTRACT**

This narrative literature review synthesizes empirical and conceptual research on the factors that shape university students' acceptance of artificial intelligence (AI) tools, particularly generative AI applications such as ChatGPT, for learning purposes. Drawing on the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) as the dominant theoretical lenses, the review organizes the literature into five thematic clusters: (1) cognitive-instrumental determinants, namely perceived usefulness and perceived ease of use; (2) social and normative determinants, including subjective norms and social influence; (3) affective and dispositional determinants, such as trust, perceived risk, anxiety, and hedonic motivation; (4) ethical and integrity-related determinants concerning academic honesty, data privacy, and algorithmic bias; and (5) sociodemographic and contextual determinants, including gender, digital literacy, and institutional support. The synthesis indicates that while perceived usefulness and ease of use remain robust predictors of behavioral intention across contexts, their explanatory power is increasingly moderated by trust, ethical perception, and institutional policy as generative AI becomes normalized in higher education. Gender and digital-literacy gaps persist as salient moderators of adoption behavior, and unresolved concerns about academic integrity continue to complicate students' attitudes even when instrumental benefits are recognized. The review concludes that AI acceptance in higher education is best understood as a multidimensional and context-dependent process rather than a purely technical adoption decision, and it offers implications for theory extension and institutional policy design, along with directions for future confirmatory research.

Keywords: artificial intelligence; technology acceptance model; higher education; generative AI; student acceptance; narrative review

ABSTRAK

Tinjauan pustaka naratif ini mensintesis penelitian empiris dan konseptual mengenai faktor-faktor yang membentuk penerimaan mahasiswa universitas terhadap perangkat kecerdasan buatan (Artificial Intelligence/AI), khususnya aplikasi AI generatif seperti Chat GPT, untuk tujuan pembelajaran. Dengan menggunakan Technology Acceptance Model (TAM) dan Unified Theory of Acceptance and Use of Technology (UTAUT) sebagai kerangka teori yang dominan, tinjauan ini mengorganisasikan literatur ke dalam lima klaster tematik, yaitu: (1) determinan kognitif-instrumental, yang mencakup persepsi kegunaan dan persepsi kemudahan penggunaan; (2) determinan sosial dan normatif, termasuk norma subjektif dan pengaruh sosial; (3) determinan afektif dan disposisional, seperti kepercayaan, persepsi risiko, kecemasan, dan motivasi hedonis; (4) determinan etika dan integritas, yang berkaitan dengan kejujuran akademik, privasi data, dan bias algoritmik; serta (5) determinan sosio demografis dan kontekstual, termasuk gender, literasi digital, dan dukungan institusional. Hasil sintesis menunjukkan bahwa meskipun persepsi kegunaan dan persepsi kemudahan penggunaan tetap menjadi prediktor yang kuat terhadap niat berperilaku di berbagai konteks, daya jelaskannya semakin dipengaruhi oleh kepercayaan, persepsi etis, dan kebijakan institusional seiring dengan semakin terintegrasinya AI generatif dalam pendidikan tinggi. Perbedaan berdasarkan gender dan tingkat literasi digital masih menjadi moderator penting dalam perilaku adopsi, sementara kekhawatiran yang belum terselesaikan mengenai integritas akademik terus mempengaruhi sikap mahasiswa meskipun manfaat instrumental AI

telah diakui. Tinjauan ini menyimpulkan bahwa penerimaan AI di pendidikan tinggi lebih tepat dipahami sebagai proses yang multidimensional dan bergantung pada konteks daripada sekadar keputusan adopsi teknologi yang bersifat teknis. Selain itu, artikel ini menawarkan implikasi bagi pengembangan teori dan perancangan kebijakan institusional, sekaligus memberikan arahan bagi penelitian konfirmatori pada masa mendatang.

Kata Kunci: kecerdasan buatan; model penerimaan teknologi; pendidikan tinggi; AI generatif; penerimaan mahasiswa; tinjauan naratif.

1. INTRODUCTION

The diffusion of artificial intelligence (AI) into higher education has accelerated sharply since the public release of large language model applications such as ChatGPT in late 2022, transforming how university students search for information, draft written work, and engage with course material (Timsina, 2024). Unlike earlier generations of educational technology, generative AI systems are conversational, adaptive, and capable of producing polished text, code, and analysis on demand, which has generated both enthusiasm about personalized learning and unease about academic integrity, cognitive over-reliance, and the erosion of critical thinking (Lund et al., 2025). Understanding why some students embrace these tools while others resist or use them cautiously has therefore become a pressing research question for higher-education scholars, administrators, and policymakers alike.

Two theoretical frameworks dominate this literature. The Technology Acceptance Model (TAM), originally developed by Davis (1989), proposes that perceived usefulness and perceived ease of use jointly determine an individual's attitude toward a technology and, in turn, their behavioral intention to use it. The Unified Theory of Acceptance and Use of Technology (UTAUT), synthesized by Venkatesh et al. (2003) from eight competing acceptance models, extends this logic by adding performance expectancy, effort expectancy, social influence, and facilitating conditions as joint predictors of behavioral intention and use. Both frameworks were designed for organizational information systems, yet they have been applied with only modest modification to student populations adopting generative AI, raising questions about whether the constructs and their relative weights transfer cleanly to an educational and conversational-AI context (García-Alonso et al., 2024; Ursavaş et al., 2025).

A growing body of empirical work has extended TAM and UTAUT with constructs that are arguably more salient for AI than for earlier technologies, including trust, perceived risk, anxiety, ethical concern, and academic-integrity moderators (Balaskas et al., 2025; Mustofa et al., 2025; Shahzad et al., 2024). At the same time, sociodemographic research has documented persistent gaps in AI adoption and confidence by gender and by digital-literacy background, suggesting that acceptance is not distributed evenly across the student population (Brown et al., 2025). What remains comparatively underdeveloped is a synthesis that draws these disparate strands together into a coherent account of the factors shaping student acceptance of AI for learning specifically, as distinct from AI adoption in workplaces or in K-12 settings.

This review therefore pursues two research questions. First, which factors, and through which theoretical mechanisms, most consistently predict university students' acceptance and use of AI tools for learning? Second, how do ethical, social, and demographic considerations condition or moderate the purely instrumental logic of TAM and UTAUT in this context? By addressing these questions through a narrative synthesis of recent empirical studies, the review aims to consolidate a fragmented literature, highlight areas of convergence and disagreement, and identify a research agenda for scholars seeking to extend acceptance theory into the generative-AI era.

2. METHODS

2.1 Review Approach

This study adopts a narrative literature review design rather than a systematic review with a fixed protocol, because the objective is to synthesize and interpret a conceptually

diverse set of studies that employ different theoretical extensions of TAM and UTAUT, rather than to exhaustively catalogue every empirical study on AI adoption in education. A narrative approach allows the discussion to be organized thematically around the mechanisms through which acceptance occurs, which better serves the goal of theory consolidation than a strictly chronological or study-by-study SLR format (following the general logic described in systematic reviews such as Luo et al., 2025, and Wu et al., 2025, whose PRISMA-based procedures this review draws on for search-scope calibration without adopting their formal screening protocol).

2.2 Literature Search and Source Selection

Sources were identified through targeted searches of academic databases and aggregators, including Scopus-indexed journals, Web of Science-indexed outlets, and open-access repositories (MDPI, Springer, Taylor & Francis, Frontiers, and SAGE platforms), using combinations of the keywords "artificial intelligence," "ChatGPT," "generative AI," "technology acceptance model," "UTAUT," "higher education," and "university students." The search focused on peer-reviewed journal articles published predominantly between 2023 and 2025, reflecting the period in which generative AI tools became widely accessible to students, while retaining foundational theoretical papers from earlier decades (Davis, 1989; Venkatesh et al., 2003) as conceptual anchors.

Inclusion criteria required that a source (a) empirically or conceptually addressed university or college students as the unit of analysis, (b) examined acceptance, adoption, intention to use, or attitudes toward AI or generative AI tools in a learning-related context, and (c) reported verifiable bibliographic information, including a digital object identifier or equivalent persistent link. Studies focused exclusively on K-12 populations, on AI use by faculty or administrators without a student-facing component, or on purely technical system-design contributions were excluded unless they provided directly relevant theoretical grounding.

2.3 Synthesis Strategy

Because this is a narrative rather than a systematic review, no formal PRISMA flow diagram, inter-rater screening, or meta-analytic pooling of effect sizes was conducted. Instead, retained sources were read in full and organized thematically according to the acceptance construct or mechanism they primarily addressed: cognitive-instrumental, social-normative, affective-dispositional, ethical-integrity, and sociodemographic-contextual. Within each theme, findings are synthesized chronologically and comparatively to highlight convergence, contradiction, and contextual moderation across national and disciplinary settings. This thematic organization directly informs the structure of the Results and Discussion section that follows.

3. RESULTS AND DISCUSSION

3.1 Cognitive-Instrumental Determinants: Perceived Usefulness and Ease of Use

Consistent with the original formulation of TAM, perceived usefulness and perceived ease of use remain the most frequently confirmed predictors of students' intention to use AI tools for learning (Davis, 1989). In a study of Spanish social-science students, García-Alonso et al. (2024) found that perceived utility and credibility of ChatGPT were central to shaping favorable attitudes, and that students with prior experience with video games or programming reported more positive perceptions of the tool. Similarly, a large multi-university study conducted in Germany reported that ease of integration into everyday study routines was a decisive factor separating regular users from occasional or non-users of AI-based tools (von Garrel & Mayer, 2023).

However, several recent studies suggest that the relative weight of ease of use is diminishing as generative AI interfaces become more familiar. Mustofa et al. (2025), studying

437 Indonesian university students, found that perceived usefulness significantly predicted attitude toward using AI tools, whereas perceived ease of use did not, a pattern the authors attribute to widespread prior familiarity with chat-based interfaces reducing the marginal value of ease-of-use perceptions. A comparable finding emerged in a Greek sample, where perceived ease of use and a newly introduced construct, perceived intelligence, significantly predicted ChatGPT adoption intention, while perceived usefulness played a more limited direct role once trust and risk were included as mediators (Balaskas et al., 2025). Foroughi et al. (2024), applying a combination of partial least squares structural equation modeling and fuzzy-set qualitative comparative analysis, likewise concluded that no single TAM construct was sufficient on its own to explain adoption; rather, configurations combining usefulness, ease of use, and complementary conditions produced high adoption intention, indicating an equifinal rather than strictly additive causal structure.

Read together, these studies suggest that the cognitive-instrumental core of TAM continues to matter for AI acceptance in higher education, but its explanatory dominance is context-dependent: it appears strongest among students encountering AI tools for the first time and weaker among cohorts for whom conversational-AI interfaces are already familiar, a pattern that has implications for how institutions should sequence AI literacy interventions across a student's academic career.

3.2 Social and Normative Determinants

Beyond individual cognition, social influence and subjective norms shape whether students perceive AI use as appropriate or expected within their academic community. Timsina (2024), applying UTAUT with an added anxiety construct across UK and Nepalese samples, found that social influence, together with performance expectancy and effort expectancy, significantly predicted ChatGPT adoption intention in both national contexts, underscoring the robustness of the social-influence pathway across cultural settings. Yet the strength of this pathway is not universal. In a large Turkish sample of 943 undergraduates across 140 universities, Ursavaş et al. (2025) reported that subjective norms had only a limited influence on behavioral intention relative to attitude, perceived usefulness, self-efficacy, and compatibility, leading the authors to argue that students increasingly weigh personal utility judgments over peer or instructor expectations when deciding whether to adopt generative AI.

This divergence may reflect the rapid normalization of generative AI: in early-adoption contexts, social validation from peers or faculty may be necessary to legitimize use, whereas in more saturated contexts, where most students already use such tools informally, individual utility judgments dominate and social pressure becomes a weaker discriminating factor. Institutional policy operates as a related but distinct normative force; students' adoption behavior has also been shown to be shaped by explicit institutional stances on AI use, which can either reinforce or dampen the effect of behavioral intention on actual use depending on whether policies are perceived as permissive or restrictive.

3.3 Affective and Dispositional Determinants: Trust, Risk, and Anxiety

A distinctive feature of AI acceptance research, relative to earlier technology-acceptance literature, is the prominence of trust, perceived risk, and anxiety as explanatory constructs. Balaskas et al. (2025) found that perceived risk fully mediated the relationship between perceived usefulness and adoption intention, and partially mediated the effects of ease of use and perceived intelligence, while perceived trust fully mediated the usefulness pathway. This indicates that instrumental beliefs about AI translate into adoption only insofar as students also judge the technology to be safe, reliable, and ethically acceptable. Shahzad et al. (2024) reached a structurally similar conclusion in a separate sample, identifying trust as a cornerstone construct that, together with performance expectancy, effort

expectancy, self-efficacy, social influence, hedonic motivation, and price value, jointly explained both adoption intention and actual use of ChatGPT.

Anxiety operates as a countervailing force. Timsina's (2024) cross-country comparison found that anxiety significantly and negatively predicted behavioral intention among UK students but not among Nepalese students, suggesting that emotional responses to AI are shaped by contextual factors such as prior exposure, media discourse about AI risk, and institutional messaging, rather than being a uniform psychological reaction. Complementing this, Lan et al. (2025) found that mindfulness, understood as a dispositional capacity for non-judgmental present-moment awareness, buffered negative affective responses and was positively associated with adoption-relevant beliefs among Chinese media students, while Li (2025) reported that mathematics anxiety did not significantly predict self-efficacy or learning interest in an AI-supported learning environment, suggesting that AI-mediated instruction may in some cases attenuate rather than amplify subject-specific anxiety. Hedonic motivation, or the enjoyment derived from using a technology, has also emerged as a significant, if secondary, predictor of adoption intention in UTAUT2-based studies of ChatGPT use in higher education, reinforcing that the decision to adopt AI for learning is not purely deliberative but also affectively colored.

3.4 Ethical and Academic-Integrity Determinants

A factor with no close analogue in classical technology-acceptance research is the ethical and academic-integrity dimension of AI use. Lund et al. (2025), surveying 277 domestic and international students at United States universities, found high awareness of academic-integrity policies alongside substantial disagreement about the severity of different forms of AI-assisted work: using AI to generate an entire paper was widely condemned as major misconduct, whereas smaller AI-assisted tasks, such as grammar checking or idea generation, were judged far less harshly. Ethical framing and institutional policy proved to be stronger predictors of perceived misconduct severity than demographic variables such as major, gender, or international status, implying that clear policy communication, rather than passive reliance on students' backgrounds, is the more actionable lever for institutions.

Marín et al. (2025), examining students and faculty across Peruvian universities, documented a related but distinct concern: the absence of clear institutional policies on data privacy and algorithmic transparency, compounded by disparities in digital infrastructure and a self-reported training gap in AI literacy among both students and instructors. Their findings suggest that ethical concern in AI acceptance is not confined to plagiarism-style academic misconduct but extends to broader anxieties about surveillance, data protection, and equitable access, particularly in developing-country higher-education systems where formal AI governance frameworks are still emerging. Mustofa et al. (2025) integrated ethics directly into an extended TAM, finding that ethical perception positively predicted attitude toward AI use, even though it did not significantly moderate the link between attitude and actual use, suggesting that ethical judgment shapes willingness to endorse AI in principle more strongly than it constrains day-to-day behavior once usage habits are established.

Taken together, this cluster of findings indicates that ethical and integrity-related concerns function less as a simple barrier to adoption and more as a parallel evaluative dimension: students can simultaneously find AI tools useful, easy to use, and ethically fraught, and institutions that address only the instrumental side of acceptance while neglecting integrity policy risk cultivating a generation of AI-literate but ethically unguided users.

3.5 Sociodemographic and Contextual Determinants

Gender differences constitute one of the most consistently reported moderators of AI acceptance in the reviewed literature. Brown et al. (2025), in a mixed-methods study of students and staff in the United Kingdom, found that male participants reported higher AI

usage frequency, more positive attitudes, and greater self-assessed AI literacy than female participants, with higher subjective socioeconomic status independently predicting more frequent use. Qualitative interviews in the same study suggested that these differences are partly rooted in confidence rather than actual competence, echoing a broader pattern in digital-literacy research in which self-perceived and measured skill diverge by gender. These findings converge with reports that female students, while not necessarily less capable, tend to approach AI tools more cautiously and place greater emphasis on ethical use, transparency, and structured institutional guidance than their male counterparts, indicating that gender differences in AI acceptance are better characterized as differences in risk orientation and trust calibration than in raw technological aptitude.

Institutional and infrastructural context further conditions acceptance. Marín et al. (2025) linked uneven AI adoption in Peruvian universities to disparities in digital infrastructure and the absence of national governance frameworks, while cross-country comparisons such as Timsina (2024) demonstrate that the same UTAUT constructs can carry different predictive weight depending on national educational culture and prior exposure to AI discourse. Systematic reviews of AI-based learning tools in higher education similarly note substantial heterogeneity in how design features, disciplinary context, and institutional support shape both the adoption and the learning-outcome benefits of AI tools, reinforcing that acceptance cannot be fully explained by individual-level psychological constructs alone (Luo et al., 2025; Wu et al., 2025).

3.6 Toward an Integrated Account of Student AI Acceptance

Synthesizing across the five thematic clusters, the reviewed literature supports an account of student AI acceptance as a layered process rather than a single-stage decision. At its core lies the classical TAM logic of perceived usefulness and ease of use, which retains explanatory power but whose relative contribution shifts as generative AI becomes a familiar, rather than novel, technology (Mustofa et al., 2025). Layered atop this instrumental core are social and normative pressures that appear strongest in early-adoption contexts and weaker once usage becomes routine (Ursavaş et al., 2025), affective and dispositional factors, particularly trust and perceived risk, that mediate whether instrumental beliefs are converted into actual adoption (Balaskas et al., 2025; Shahzad et al., 2024), and ethical evaluations that operate as a partially independent axis of judgment capable of coexisting with strongly positive instrumental attitudes (Lund et al., 2025; Marín et al., 2025). Finally, sociodemographic and infrastructural context, especially gender and institutional digital-literacy support, moderates the strength and even the direction of these relationships across settings (Brown et al., 2025).

This layered picture helps explain why single-theory applications of TAM or UTAUT to generative AI sometimes yield inconsistent results across studies: models that omit trust, risk, or ethical constructs risk overstating the role of ease of use, while models that omit sociodemographic moderators risk treating a heterogeneous student population as a single undifferentiated adopter type. The pattern also suggests a practical implication for higher-education institutions, namely that interventions aimed purely at improving AI usability or demonstrating usefulness are unlikely to be sufficient on their own; they must be paired with transparent institutional policy on academic integrity and data governance, and with targeted literacy support for groups, such as female students or those with limited prior digital exposure, who report lower confidence despite comparable underlying competence.

4. CONCLUSION

This narrative review set out to identify which factors most consistently shape university students' acceptance of AI tools for learning and to examine how ethical, social, and demographic considerations condition the largely instrumental logic of TAM and UTAUT. The synthesized literature indicates that perceived usefulness and ease of use remain foundational

but decreasingly sufficient predictors on their own, and that trust, perceived risk, anxiety, subjective norms, ethical perception, and sociodemographic context each contribute independent and often interacting explanatory power. Generative AI acceptance in higher education therefore appears best modeled as a multidimensional, context-sensitive process in which instrumental, social, affective, ethical, and demographic layers jointly determine whether, and how confidently, a student adopts these tools for academic work.

Theoretically, the review suggests that continued application of unmodified TAM or UTAUT to generative AI in education is likely to produce an incomplete account, and that future models should treat trust, risk, and ethical perception as core rather than peripheral constructs, given their consistent mediating role across multiple national contexts (Balaskas et al., 2025; Mustofa et al., 2025; Shahzad et al., 2024). Practically, the findings imply that universities seeking to support responsible and equitable AI adoption should pair usability-focused interventions with explicit, clearly communicated integrity and data-governance policies (Lund et al., 2025; Marín et al., 2025), and with literacy programs that address confidence gaps by gender and prior digital exposure rather than assuming uniform baseline competence across the student body (Brown et al., 2025).

This review is subject to limitations inherent to the narrative method: it does not apply a systematic, protocol-driven search and screening procedure, does not quantitatively pool effect sizes across studies, and draws predominantly on cross-sectional, self-report evidence, which limits causal inference and may be affected by social-desirability bias in reporting academic-integrity attitudes. Future research would benefit from longitudinal designs that track how acceptance factors evolve as generative AI tools mature and become further embedded in curricula, from cross-cultural confirmatory studies that formally test the moderating role of national educational context, and from mixed-methods work that connects self-reported acceptance constructs to observed patterns of academic performance and integrity outcomes. A systematic review or meta-analysis building on the thematic structure proposed here would also help quantify the relative weight of the cognitive-instrumental, social-normative, affective-dispositional, ethical-integrity, and sociodemographic-contextual determinants identified in this synthesis.

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