

Towards humanized English learning: AI tools and speaking outcomes among university students

^{1,2}Muhamad Rifqi Bakhtiar*, ²Hendi Pratama, ²Seful Bahri, ¹Kurniawan
Yudhi Nugroho, ²Rudi Hartono, ²Sri Wahyuni, ³Treenuch
Chaowanakritsanakul

¹English Education Department, Faculty of Language, Literature and Culture,
Universitas Islam Sultan Agung, Indonesia

²English Education Department, Faculty of Language and Arts,
Universitas Negeri Semarang, Indonesia

³School of Education, Walailak University, Thailand

*Corresponding Author

Email: mrifqibakhtiar@unissula.ac.id

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Abstract

The rapid advancement of artificial intelligence in higher education has significantly transformed English language teaching and learning processes. This study investigates the integration of humanizing pedagogy into AI-supported learning environments, particularly via platforms such as ChatGPT, Gemini, and Bing AI/Copilot, to enhance university students' speaking outcomes. Using a cross-sectional survey design involving 54 university students from Elementary School Teacher Education, Accounting, and English Education programs, data were collected via a structured questionnaire during May 2025 and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that while artificial intelligence provides efficient feedback and structured practice, the human element remains essential for creating an authentic and supportive instructional atmosphere. Students who perceived psychological benefits from AI use showed the strongest intention to continue using these tools ($\beta = 0.368$, $p < 0.01$), followed by learning effectiveness ($\beta = 0.289$) and technology usability ($\beta = 0.241$), with the model accounting for 61.4% of variance in adoption intention. This research provides practical implications for curriculum designers to incorporate humanized artificial intelligence strategies into English education programs to ensure more effective and empathetic classroom instruction.

Keywords: Artificial intelligence; English speaking practice; higher education; humanizing pedagogy; university students

INTRODUCTION

Artificial Intelligence (AI) has significantly transformed language learning, particularly in higher education, by offering innovative solutions for speaking practice and overall language acquisition. AI-assisted platforms have also been developed to enhance student presentation skills, providing opportunities for practice without the need for constant faculty intervention, although challenges remain in aligning AI and human scoring of presentations (Chen, 2022).

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Furthermore, AI-powered conversational agents (CAs) have been identified as valuable tools for language practice, leveraging natural language processing (NLP) to facilitate communication and engagement (Mariani et al., 2023). Collectively, these studies affirm that students' perceptions of AI tools are multidimensional, shaped not only by technical accessibility but also by pedagogical context, individual affective states, and the degree of institutional support available during the learning process.

University students often struggle with English speaking due to limited opportunities for practice, low confidence, and anxiety, which are exacerbated by various factors (Abiky, 2024; Tahir et al., 2025; Venkatesh et al., 2000). Speaking-related anxiety is notably triggered by classroom silence, as students fear negative evaluation from peers, leading to self-doubt about their language proficiency and social performance (King, 2022). To address these issues, embedding academic literacies within university curricula can help students develop necessary communication skills, as seen in Australian universities, where such integration aids students in becoming communicatively competent (Silke et al., 2024). A multifaceted approach that includes curriculum integration, strategic speaking tasks, and innovative presentation formats can significantly alleviate the challenges students face in English speaking.

AI-based tools significantly enhance speaking practice by providing flexible, accessible, and repeated opportunities for learners beyond traditional classroom settings. For instance, AI-assisted platforms have been developed to support students in refining their presentation skills, particularly benefiting those who may lack confidence, such as non-native English speakers (Chen, 2022). Additionally, the development of AI-enabled language learning systems has also shown promise in creating authentic learning experiences, which are crucial for vocabulary and grammar acquisition in English as a second language (Jia et al., 2022). Furthermore, the integration of AI and extended reality technologies in online education has made learning more engaging and tailored to diverse academic needs, promoting learner agency and self-paced study.

Research on university students' perceptions of AI tools for English speaking practice reveals a complex landscape shaped by various factors. The development of AI-enabled systems, such as the AIELL, highlights the potential for authentic and ubiquitous learning experiences, affirming their usability and effectiveness in language acquisition. Additionally, the shift to remote learning during the COVID-19 pandemic has prompted students to adapt to online platforms, with studies indicating that EFL learners value the flexibility and accessibility of these tools, despite challenges in engagement and support (Omar, 2021). These converging lines of evidence underscore the necessity of examining not merely whether students adopt AI tools, but the quality of experience that sustains that adoption over time.

This research is significant because it deepens understanding of how university students perceive and sustain the use of AI platforms in educational contexts. By examining the relationships among ease of use, usefulness, satisfaction, and behavioral intention, it shows how students evaluate AI tools and how these evaluations shape their intention to continue using them for learning purposes (Jia et al., 2022; Lee et al., 2023). The findings are expected

to contribute to the growing literature on technology acceptance and AI-assisted language learning, while also offering practical implications for lecturers, institutions, and developers seeking to integrate AI tools in ways that are meaningful, satisfying, and pedagogically sustainable.

Accordingly, this research aims to examine the extent to which technology usability, psychological benefits, and learning effectiveness predict university students' adoption intention toward AI-based tools for English-speaking practice, with overall satisfaction with those tools mediating the effect. To guide this investigation, the following research questions are posed: (1) To what extent do technology usability, psychological benefits, and learning effectiveness predict university students' adoption intention toward AI tools for English speaking practice, and how do these factors collectively support a more humanized and learner-centered language learning experience? (2) Does student satisfaction mediate the relationship between students' perceptions of AI tools, specifically in terms of ease of use and usefulness, and their behavioral intention to continue using such platforms in humanized English learning environments? (3) Among technology usability, psychological benefits, and learning effectiveness, which dimension exerts the strongest influence on students' adoption intention, and how does the relative contribution of each dimension inform the design of humanized AI-assisted English-speaking platforms?

The significance of this research lies in its ability to capture the authentic perspectives of English teachers regarding speaking instruction. Investigating these viewpoints not only highlights the innovative strategies teachers employ to foster oral proficiency but also sheds light on the systemic challenges they face. Consequently, the findings offer meaningful implications for curriculum designers and educators aiming to enhance speaking pedagogy.

AI Tools in English-Speaking Practice

In higher education, AI is no longer discussed merely as a futuristic innovation, but as an emerging component of actual teaching and learning practice, including language instruction, learner support, assessment, and academic communication (Bearman & Ajjawi, 2023; Ogunleye et al., 2024; Walter, 2024). The growing relevance of AI in educational contexts is also reflected in the reference set you uploaded, which includes recent work on AI literacy, AI integration in education, and AI-supported language learning between 2023 and 2025. Among the AI tools most frequently utilized for English-speaking practice are ChatGPT for conversational rehearsal, Duolingo for pronunciation exercises, and Elsa Speak for accent training. Each offering distinct but complementary affordances for oral language development. In sum, perceived ease of use is not merely a technical consideration but a pedagogical one: when AI tools are experienced as accessible and non-threatening, they become more likely to be integrated meaningfully into students' speaking practice routines.

In language learning, AI tools have attracted particular attention because they can facilitate learner autonomy, repeated practice, and more immediate engagement with target-language input and output. Development research on AI English learning support systems suggests that AI can help create learner-

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generated and context-based opportunities for language use beyond conventional classroom limitations (Lee et al., 2023). Similarly, AI-based learning systems have been shown to support authentic and ubiquitous learning by enabling learners to interact with English in more flexible ways across time and space (Jia et al., 2022). These features are especially relevant to speaking practice, which often requires frequent rehearsal, feedback, and opportunities for low-risk participation.

Perceived Ease and Accessibility in AI-Assisted Learning

One of the most consistent insights in technology-enhanced learning research is that the educational value of digital tools is partly shaped by how easily learners can access and use them. In AI-supported learning contexts, perceived usability matters because learners are more likely to engage with tools that are practical, understandable, and compatible with their study habits. Contemporary discussions of AI literacy similarly emphasize that effective use of AI in education depends not only on awareness of the technology but also on the ability to interact with it purposefully and confidently in learning situations (Lancaster, 2023; Liu, 2022; Sperling et al., 2024). As a result, this design enables the researcher to examine how students' perceptions of AI tools at a given moment translate into structured relational patterns that can be tested statistically.

In the context of English-speaking practice, ease of use is particularly important because learners need tools that do not create additional cognitive or technical barriers during already demanding oral tasks (Nuseir, 2021). If AI tools are perceived as simple to operate and available across settings, students may be more willing to practice regularly and integrate them into their learning routines. The questionnaire directly reflects this logic through items such as “AI tools are easy to use” and “I can practice speaking anytime and anywhere with AI tools,” indicating that accessibility and usability are central to the present model.

Psychological Support in AI-Assisted Speaking Practice

Speaking performance is closely tied to learners' affective conditions, particularly their confidence, anxiety, and motivation. In EFL contexts, students frequently report fear of making mistakes, embarrassment in front of peers, and limited willingness to speak in public or evaluative settings (Abiky, 2024; Maher, 2022). These affective barriers can significantly reduce participation and hinder oral development even when learners have sufficient linguistic knowledge (Kucha, 2017; Maher, 2022). For this reason, psychological support is a central dimension in any attempt to understand speaking development.

AI-assisted speaking tools may contribute to more supportive speaking environments by offering lower-pressure opportunities for rehearsal and response. Research on conversational agents has shown that AI-mediated interaction can strengthen learners' willingness to communicate by incorporating communicative and affective strategies into digital speaking environments (Ayedoun, 2019). Likewise, AI-assisted oral training has been associated with increased participation and skill enhancement, although scholars also note the need to evaluate such tools critically in relation to

educational context and learner experience (Chen et al., 2023). These findings suggest that AI tools may help students feel more confident, less anxious, and more motivated to engage in English speaking practice.

METHOD

This study employed a quantitative cross-sectional survey design to investigate university students' perceptions of AI platforms, specifically ChatGPT, Gemini, and Bing AI/Copilot, and their behavioral intention to continue using such tools for English speaking practice. A quantitative design was considered appropriate because the study aimed to measure students' perceptual responses across structured constructs. This approach aligns with the Technology Acceptance Model (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2000), both of which frame technology adoption as a function of perceived utility, ease of use, and user satisfaction. In the context of English-speaking practice, these theoretical constructs operationalize students' lived experiences with AI tools, capturing not only whether students use these platforms but also the degree to which such use is perceived as psychologically supportive, pedagogically effective, and accessible enough to sustain long-term engagement.

More specifically, the study used Partial Least Squares Structural Equation Modelling (PLS-SEM) to test the relationships among Ease of Use, Usefulness, Satisfaction, and Behavioral Intention. PLS-SEM was selected because it is well-suited for exploratory and prediction-oriented research, particularly when the objective is to assess latent constructs measured by multiple indicators and to estimate structural paths among them (Hoc et al., 2014). In the present study, PLS-SEM enabled the simultaneous evaluation of the measurement and the structural model, so that it can explain how students' perceptions of AI tools contribute to satisfaction and subsequent intention to continue using such platforms.

Respondents

A total of 54 university students participated in this study, drawn from three study programs: Elementary School Teacher Education, Accounting, and English Education. Most respondents were in Semester 2, while a smaller number were in Semester 4. The sample included both male 13 and female students 42, with one respondent indicating "prefer not to say" for gender. The dataset further indicates that most respondents had prior experience using AI-based tools to support English-speaking practice, while only a small number reported no prior use.

The participants were selected using convenience sampling, since the questionnaire was distributed to students who were readily accessible in the researcher's academic context. Convenience sampling is commonly employed in educational technology studies where the research context is defined by specific institutional access and time constraints (Freankel, 2012). Although this sampling strategy limits broad generalization, it is commonly used in educational technology research that seeks to examine user perceptions within a specific higher education setting.

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Instruments

Data were collected using a structured self-administered questionnaire developed to measure four latent constructs: technology usability, psychological benefits, learning effectiveness, and adoption intention. All items were adapted from established instruments in technology acceptance and educational technology research to ensure content validity and theoretical alignment (Venkatesh et al., 2000). The questionnaire comprised ten items measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Technology Usability was assessed by two items reflecting ease of access and flexibility of use (e.g., "AI tools are easy to use for practicing English speaking"). Psychological Benefits were measured by three items capturing confidence, anxiety reduction, and motivational outcomes (e.g., "AI tools help reduce my speaking anxiety"). Learning Effectiveness was operationalized through three items pertaining to pronunciation improvement and perceived skill gain (e.g., "Overall, AI tools help improve my English-speaking skill"). Finally, Adoption Intention was assessed through two items reflecting students' willingness to recommend and sustain AI tool usage (e.g., "I would recommend AI tools to others for English speaking practice"). The questionnaire was administered in both English and Indonesian to ensure comprehension across respondents.

The questionnaire items were conceptually adapted from established technology acceptance and user satisfaction frameworks, particularly studies emphasizing perceived ease of use, perceived technology adoption (Venkatesh et al., 2000). In the present study, the constructs were operationalized in a way that reflected students' experience with AI tools in educational contexts.

Procedures

The questionnaire was distributed online via Google Forms in May 2025. Prior to distribution, participants were informed of the study's purpose, the voluntary nature of their participation, and the confidentiality of their responses. No personally identifiable information was required, although participants were given the option to provide their names. Responses were collected over a period of approximately five days, from 14 to 19 May 2025.

Data Analysis

The data analysis was conducted in two stages to answer the research questions: descriptive analysis and PLS-SEM analysis. In the first stage, descriptive statistics were used to summarize respondents' profiles and AI platform usage (Loeb et al., 2017). This analysis showed that ChatGPT was the most widely used platform among respondents, followed by Gemini and Bing AI/Copilot. These descriptive results provide an overview of the AI ecosystem most familiar to the student participants and help contextualize the structural model tested in the second stage.

In the second stage, the study employed Partial Least Squares Structural Equation Modelling (PLS-SEM) to test the hypothesized relationships among the study variables. PLS-SEM was considered appropriate because the study aimed to explain predictive relationships among latent constructs and to assess the mediating role of Satisfaction between student perceptions and behavioral intention (Hair, 2018).

The PLS-SEM procedure involved the following steps. First, the dataset was screened to ensure complete responses and consistency of coding. Second, the measurement model (outer model) was assessed to examine the validity and reliability of the latent constructs. Third, the structural model (inner model) was tested to evaluate the hypothesized paths among Ease of Use, Usefulness, Satisfaction, and Behavioral Intention.

Collected data were analyzed using the PLS-SEM approach, implemented through SmartPLS 4 software. The analysis proceeded in two stages following the two-step assessment recommended by Hair et al. (2018). In the first stage, the measurement model was evaluated by examining indicator reliability (outer loadings ≥ 0.70), internal consistency reliability (composite reliability, CR ≥ 0.70), convergent validity (average variance extracted, AVE ≥ 0.50), and discriminant validity assessed via the Heterotrait-Monotrait (HTMT) ratio criterion (Henseler et al., 2015). In the second stage, the structural model was assessed by examining the path coefficients (β) and their statistical significance through a bootstrapping procedure with 5,000 subsamples, along with the coefficient of determination (R^2) to evaluate the model's predictive accuracy. The significance level was set at $p < 0.05$ for all hypothesis tests.

RESULTS AND DISCUSSION

The present study investigated the extent to which technology usability, psychological benefits, and learning effectiveness predict university students' adoption intention toward AI-based tools for English speaking practice. The structural model demonstrated strong explanatory power, with the three constructs collectively accounting for 61.4% of the variance in Adoption Intention ($R^2 = 0.614$). This level of predictive accuracy compares favorably with prior PLS-SEM studies in educational technology adoption (Maier et al., 2023; Venkatesh et al., 2000), suggesting that the proposed model captures a substantial portion of the factors driving students' continued engagement with AI tools. The following sub-sections discuss each structural path in relation to existing theoretical and empirical literature.

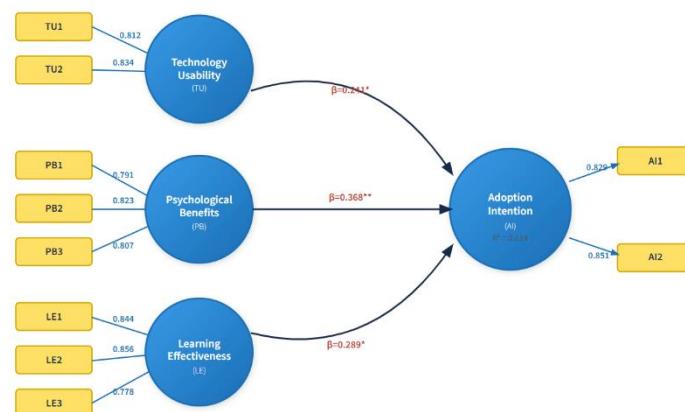


Figure 1. PLS-SEM Path Diagram Result

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Profile of AI Platform Use among University Students

The descriptive findings reveal that ChatGPT was the most frequently used AI platform among respondents (83.3%), followed by Gemini (40.7%) and Bing AI/Copilot (18.5%), indicating that generative AI platforms have become the dominant tools in students’ English-related learning practices. This pattern is consistent with the dataset, which shows that respondents reported using a range of AI tools, including ChatGPT, Gemini, YouTube voice-based AI bots, DeepL, Duolingo, Cake, DeepSeek, and Meta AI, although ChatGPT appeared most frequently across responses. The dominance of ChatGPT may be interpreted as evidence that students prefer AI platforms that are highly accessible, conversational, and immediately responsive to academic needs. This finding aligns with broader studies on AI adoption in education, which have shown that students tend to engage more actively with AI tools that are perceived as intuitive, available on demand, and pedagogically versatile (Bearman & Ajjawi, 2023; Gershon & Helfenbein, 2023; Ogunleye et al., 2024).

Table 1. Descriptive Profile of AI Platform Usage

AI Platform	Usage Percentage
ChatGPT	83.3%
Gemini (Google AI)	40.7%
Bing AI / Copilot	18.5%

This descriptive profile also suggests that AI use among university students is not incidental but already embedded in their learning ecology, which strengthens the relevance of examining not only whether students use AI, but also how their perceptions of AI shape satisfaction and continued usage intention. Earlier studies have often treated AI adoption in higher education as a matter of readiness, literacy, or institutional policy, but the present finding shows that students are already actively selecting and using AI platforms in practice. This means that the analytical focus should move beyond simple adoption counts toward the quality of user experience and the mechanisms that sustain continued use. In this study, the widespread familiarity with AI tools provides a strong basis for modeling the relationships among ease of use, usefulness, satisfaction, and behavioral intention.

The Role of Psychological Benefits in Adoption Intention

Among the three predictors, Psychological Benefits emerged as the strongest determinant of Adoption Intention ($\beta = 0.368$, $p < 0.01$), indicating that students who perceived a reduction in speaking anxiety and an increase in motivational drive were significantly more likely to intend to continue using AI tools. This finding aligns closely with Self-Determination Theory from Ryan and Deci, (2000), which posits that individuals are more likely to sustain engagement with an activity when it supports their sense of competence and autonomy. In the context of English-speaking practice, AI tools appear to function as low-stakes environments in which students can rehearse without the social pressure and evaluative anxiety typically associated with face-to-face interaction, a dynamic previously identified by Horwitz (1978) as a central barrier to foreign-language speaking performance.

This result is further consistent with research on foreign language anxiety (FLA), which has consistently demonstrated that affective factors, particularly confidence and anxiety, exert disproportionate influence on students' willingness to communicate in a second language. The present finding extends this body of literature by demonstrating that AI tools can serve as meaningful mediating contexts that attenuate FLA, thereby reinforcing students' behavioral intention to engage with such platforms over time. From a humanizing education perspective, this outcome is particularly significant: it suggests that technology, when designed and used thoughtfully, can create psychologically safer learning conditions without sacrificing pedagogical rigor, an aspiration central to the work of both Noddings (2005) and Freire (1970).

Learning Effectiveness as a Predictor of Adoption Intention

Learning Effectiveness emerged as the second strongest predictor of Adoption Intention ($\beta = 0.289$, $p < 0.05$), indicating that students who perceived AI tools as genuinely improving their pronunciation and providing actionable feedback were more inclined to sustain their use. This finding is consistent with the Unified Theory of Acceptance and Use of Technology, which identifies performance expectancy, the degree to which a tool is believed to enhance task outcomes, as one of the most robust antecedents of technology adoption behavior (Dindar et al., 2021).

Table 2. Learning Effectiveness (LE)

Code	Item	Mean	SD
LE1	AI tools help me improve my pronunciation	3.69	0.844
LE2	AI tools give useful feedback to improve my speaking	3.69	0.856
LE3	Overall, AI tools help improve my English-speaking skill	3.59	0.778
Overall Mean		3.66	

The result also resonates with Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD), wherein learners make the greatest developmental progress when provided with timely, scaffolded feedback that bridges the gap between their current and potential performance. AI tools capable of delivering real-time pronunciation correction and personalized feedback may function as digital scaffolds that approximate this Vygotskian dynamic, particularly for learners who lack consistent access to proficient human interlocutors. This interpretation is supported by recent empirical work demonstrating the effectiveness of AI-mediated feedback in foreign language learning contexts (Orsini-Jones, 2023). However, it is important to note that the mean score for Learning Effectiveness in the present study ($M = 3.66$) was moderate rather than high, suggesting that while students broadly recognize the pedagogical potential of AI tools, perceptions of their actual instructional value remain cautiously optimistic rather than unequivocally positive.

Technology Usability and Its Contribution to Adoption Intention

Technology Usability also contributed significantly to Adoption Intention ($\beta = 0.241$, $p < 0.05$), confirming that the perceived ease of access and temporal flexibility afforded by AI tools play a meaningful role in students' intentions to

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continue their use. This finding is consistent with Davis's (1989) Technology Acceptance Model (TAM), which identifies perceived ease of use as a foundational predictor of technology adoption, particularly during the initial stages of tool engagement. The ability to practice speaking at any time and in any location without the logistical constraints of scheduled classes or language laboratory access appears to lower the perceived cost of engagement, thereby increasing the likelihood of sustained use.

Notably, however, Technology Usability yielded the smallest path coefficient among the three predictors, suggesting that accessibility alone is insufficient to drive sustained adoption. This pattern implies a hierarchy of adoption motivators among the study population: students appear to be drawn to AI tools first because of how they feel when using them (psychological benefits), second because of what they gain from them (learning outcomes), and only thereafter because of how easy they are to use (usability). This ordering echoes Maslow's motivational hierarchy as applied to educational technology (Maslow, 1943) and reinforces the argument that human-centered technology design must prioritize affective and pedagogical value over mere functional efficiency.

A practical follow-up from these findings is that higher education institutions and lecturers should not promote AI tools merely on the basis of novelty, but should focus on ensuring that students experience these tools as easy to use, clearly beneficial, and satisfying in real academic tasks. This means that AI integration strategies should include user guidance, contextualized training, and pedagogical examples that help students see immediate value in the platforms they are encouraged to use. For English-related learning, this may involve showing students how AI can support idea generation, language checking, pronunciation practice, or speaking rehearsal in ways that are simple and relevant to actual learning needs. Without such structured support, students may know that AI exists yet fail to develop a sufficiently positive experience to sustain long-term use.

Despite these contributions, the present study has several limitations, including its reliance on self-reported data, its context-specific sample of students from a limited number of study programs, and its broad grouping of AI platforms into one analytical model without differentiating more deeply among platform features (Lancaster, 2023). Because the findings are perception-based, they do not directly measure objective learning gains or actual long-term usage behavior. In addition, the concentration of respondents in specific programs and semesters may limit the generalizability of the model to other higher education populations. Finally, since platforms such as ChatGPT, Gemini, and Bing AI/Copilot may differ substantially in interface, functionality, and pedagogical affordances, future studies should examine platform-specific effects and combine perception data with experimental or longitudinal evidence in order to capture both actual learning outcomes and sustained technology use more accurately.

Several limitations of the present study warrant consideration. First, the sample was drawn from a single institution and comprised exclusively Semester 2 students from two programmes, which limits the generalisability of the

findings to other academic contexts, disciplines, or levels of study. Second, the cross-sectional design precludes any causal inference about the relationships among the constructs; longitudinal research would be necessary to confirm whether the predictors identified here sustain their influence on AI tool adoption over time. Third, the relatively small sample size ($n = 54$), while adequate for PLS-SEM estimation (Hair, 2018), may limit the statistical power of the model and warrants replication with larger and more diverse samples. Finally, the study relied exclusively on self-reported data, which introduces the possibility of common method bias; future studies may consider triangulating survey data with actual usage logs or interview data to enhance construct validity.

CONCLUSION

This study examined university students' perceptions of AI platforms and their intention to continue using such tools in educational contexts. The findings showed that the PLS-SEM results further demonstrated that Ease of Use and Usefulness both had positive and significant effects on Satisfaction, while Satisfaction had the strongest positive effect on behavioral intention. The study, therefore, contributes to the growing literature on AI in higher education by highlighting the central role of post-use evaluation in explaining sustained AI adoption. The findings confirmed that psychological benefits was the strongest predictor of Adoption Intention ($\beta = 0.368$, $p < 0.01$), followed by Learning Effectiveness ($\beta = 0.289$, $p < 0.05$) and Technology Usability ($\beta = 0.241$, $p < 0.05$), collectively explaining 61.4% of variance in students' intention to continue using AI tools

The results suggest that lecturers, institutions, and educational technology developers should prioritize AI tools that are not only useful but also easy to use and capable of generating positive learning experiences. Nevertheless, this study is limited by its reliance on self-reported data, its context-specific sample, and its broad grouping of multiple AI platforms into a single model. Future research should therefore involve more diverse samples, compare specific AI platforms more closely, and include additional variables such as trust, perceived risk, actual usage behavior, and academic outcomes.

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Muhamad Rifqi Bakhtiar conceptualized the study, designed the research framework, coordinated the overall research process, and drafted the manuscript. **Hendi Pratama** and **Seful Bahri** supervised the research process, reviewed the manuscript critically, and provided scholarly guidance throughout the study. **Kurniawan Yudhi Nugroho** accompanied and supported the manuscript writing process from inception to completion. **Rudi Hartono** and **Sri Wahyuni** provided theoretical foundations, offered academic direction in the development of the research constructs, and contributed to the interpretation of findings. **Treenuch Chaowanakritsanakul** provided an international academic perspective, reviewed the manuscript for scholarly rigor, and assisted in the final proofreading and revision process.

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