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University students' intentions to use AI applications for learning an additional foreign language: A TAM study in Vietnam

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Abstract

During the ongoing digital transformation, a growing range of artificial intelligence (AI) applications has become available to support foreign-language learning. Grounded in the Technology Acceptance Model (TAM), this study examines how perceived usefulness (PU) and perceived ease of use (PEOU) shape university students' attitudes (ATT) toward AI applications and, in turn, their intention to use these applications for learning an additional foreign language (INT). Data were collected through a cross-sectional, convenience-sample survey of 300 undergraduate students at the University of Finance – Marketing (UFM), Vietnam, who reported prior experience using AI applications for language learning; responses were analyzed using PLS-SEM. The results show that both PEOU ($\beta = 0.756, p < 0.001$) and PU ($\beta = 0.227, p = 0.004$) positively predict ATT (adjusted $R^2 = 0.659$), and that ATT in turn positively predicts INT ($\beta = 0.594, p < 0.001$; adjusted $R^2 = 0.350$), with PEOU exerting a substantially stronger influence than PU. Because the design is cross-sectional and self-reported, and because the sample was restricted to students who had already adopted AI applications, the findings describe behavioral intention rather than actual use or learning effectiveness. The study extends TAM to the context of AI-assisted additional-language learning and offers universities practical guidance on promoting the usability of AI tools in language teaching.

Keywords: artificial intelligence; technology acceptance model; foreign language learning; behavioral intention; higher education; Vietnam

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1. Introduction

Globalization is impacting every sector of the world, including education. Today, students are increasingly interested in improving their skills, not only in their professional fields but also in certifications and foreign-language communication skills. In addition to English, students are now interested in learning an additional foreign language to further enhance their ability to work in international environments (Ishida et al., 2024). In the Vietnamese higher-education context, an additional foreign language refers to a language other than English - most commonly Chinese, Korean, or Japanese - that students choose to study, since English is already treated as a compulsory subject in most curricula and improved employability increasingly requires a further language. Foreign languages play a crucial role as a means of international communication and a tool for connecting people worldwide (Lashari et al., 2017). This is especially important for students planning to study abroad or work in international environments, where proficiency in multiple languages is essential. Today, amid digital transformation, many technological applications have emerged, including the rapid

development of artificial intelligence (AI) for foreign language learning, which is bringing positive changes to students' needs and motivation to learn foreign languages. AI-assisted foreign language learning tools include: AI chatbots (ChatGPT, Google Gemini) that help students conduct live conversations, explain specialized terminology, and create communication scenarios; AI-integrated language applications like Duolingo that can build learning paths and practice pronunciation; and AI-powered speaking practice applications like Talkpal AI that practice pronunciation and simulate real-life situations. Thus, technology greatly supports students today in improving their foreign language proficiency.

Despite the availability of numerous supporting tools and their recognized effectiveness in foreign language learning, their acceptance and actual use remain quite limited. The intention to learn a foreign language is understood as the learner's deliberate choice and commitment to mastering it (Bai & Wang, 2020). This intention is influenced by various motivational factors, including both intrinsic and extrinsic factors (Sun et al., 2025). According to Li et al. (2024), students' intention to learn a foreign language correlates significantly with their perceived ability to control their behavior. This suggests that when students feel capable and in control of their learning, their desire to learn increases and they participate more actively in foreign-language learning activities (Sun et al., 2025). Furthermore, learning intentions increase motivation, thereby fostering a positive attitude towards learning a new language (Wu et al., 2022). Attitudes are considered psychological phenomena that strongly influence learners' subjective behavior and emotions (Alhamami, 2017). It is important to distinguish between the general intention to learn a foreign language, which reflects overall motivation toward the language itself, and the narrower construct examined in this study - students' intention to use AI applications as a tool to support that learning. Because the focus here is on the antecedents of this AI-specific intention rather than on general awareness of AI tools, participants were restricted to students who had already used at least one AI application for learning an additional foreign language; this sampling choice, and its implications for the scope of the findings, is discussed in the Limitations section. Therefore, applying TAM to examine students' intention to use AI applications for learning an additional foreign language (INT) is both necessary and appropriate in the current research context.

Research on AI adoption in education has expanded rapidly in recent years; however, most existing studies have concentrated on English language learning or the general acceptance of educational technologies. A growing number of studies have begun to examine students' motivation and intention to use AI chatbots specifically for English learning (Huang et al., 2025; Sun et al., 2025), but comparatively little attention has been paid to students' willingness to use AI applications to learn an additional (non-English) foreign language, particularly in the context of higher education in developing countries such as Vietnam. In addition, prior research has primarily examined technology acceptance rather than the specific process by which students form the intention to use AI as a learning tool for an additional foreign language. Against this background, the present study investigates the effects of perceived usefulness and perceived ease of use on students' attitudes and their intention to adopt AI applications for additional-language learning. By doing so, the study broadens the application of the Technology Acceptance Model (TAM) to AI-assisted language learning and provides empirical evidence from Vietnamese university students.

2. Theoretical background and hypotheses development

2.1. *The Technology Acceptance Model - TAM*

The Technology Acceptance Model (TAM) was introduced by Davis (1989) to explain why individuals decide to accept or reject a new technology. The model proposes that technology adoption is largely determined by users' perceptions rather than by the system's technical characteristics. Specifically, two cognitive beliefs - Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) - play a central role in shaping users' attitudes and their intention to use a technology. Perceived usefulness refers to the extent to which users believe that a technology can improve their performance or help them achieve desired outcomes, whereas perceived ease of use reflects how simple and effortless the technology is perceived to be. When users recognize both benefits and ease of operation, they are more likely to develop favorable attitudes toward the technology and become willing to use it (Davis, 1989).

Over the past three decades, TAM has been widely employed to examine technology adoption in various settings, including education, e-learning, mobile learning, and digital learning platforms. One reason for its extensive application is its ability to explain user acceptance using a relatively simple yet robust theoretical framework. Numerous empirical studies have consistently shown that perceived usefulness and perceived ease of use significantly predict users' attitudes and behavioral intentions across different technological environments (Davis et al., 1989; Venkatesh & Davis, 2000). As educational institutions increasingly integrate AI-based applications into teaching and learning activities, TAM remains a useful framework for understanding how students evaluate and accept these technologies.

In the context of additional-language learning, AI applications offer learners various forms of support, such as personalized learning, real-time feedback, pronunciation practice, and interactive communication. However, students are unlikely to adopt these tools unless they perceive them as both beneficial and easy to use. For this reason, TAM provides an appropriate theoretical foundation for examining the factors that shape students' attitudes toward AI applications and their intention to use these technologies for learning an additional foreign language. From this perspective, the present study investigates how perceived usefulness and perceived ease of use influence students' attitudes, which in turn affect students' intention to use AI applications for learning an additional foreign language (INT).

2.2. *Definitions and hypotheses*

Perceived usefulness (PU) is understood as the degree to which users believe that using technology will provide practical benefits, helping to improve work performance or achieve desired goals.

Perceived ease of use (PEOU) reflects the degree to which users believe that using a system requires little effort - that is, it is easy to learn and operate. The easier a system is to use, the more likely it is to be perceived as useful, as users can apply it with little effort.

Within the framework of TAM, both PU and PEOU influence user attitudes towards technology use. These attitudes act as intermediaries, affecting user behavioral intentions. In other words, when users perceive a technology as useful and easy to use, they develop a positive attitude, thereby increasing their intention to use it. Within the TAM framework, perceived usefulness is regarded as an important factor in shaping users' evaluations of a technology. When individuals believe that a technological tool can improve learning performance or help

them achieve their learning goals, they are more likely to develop a positive attitude toward its use (Davis, 1989). Similar findings have been reported in studies on AI-supported learning, in which perceived usefulness has been found to strengthen students' attitudes toward adopting AI applications in educational settings (Roy et al., 2022; Kanont et al., 2024; Ma et al., 2024).

Perceived ease of use also plays a key role in technology acceptance. A system that is easy to learn and operate requires less effort from users, making it more attractive and encouraging favorable evaluations (Davis, 1989). In educational contexts, previous research has likewise shown that students tend to express more positive attitudes toward AI-assisted learning when they perceive these applications as simple and convenient to use (Malik et al., 2021; Songkram et al., 2023).

H1: Perceived usefulness (PU) positively influences Attitude (ATT).

H2: Perceived ease of use (PEOU) positively influences Attitude (ATT).

Attitudes are intrinsic psychobehavioral processes that significantly influence human behavior and emotions (Chou et al., 2021). Attitudinal tendencies toward a particular behavior exist and help transform an individual's subjective perception into concrete behavior in practice (Li et al., 2024). Therefore, attitudes and behavioral intentions are closely related. Through various mechanisms, positive attitudes contribute significantly to improving students' foreign language learning behavior.

According to Ajzen (1991), intention reflects the level of effort an individual is willing to invest in performing a given behavior, with stronger intentions generally associated with a higher likelihood of enacting that behavior. Ajzen's Theory of Planned Behavior (TPB) further proposes that intention is jointly shaped by attitude toward the behavior, subjective norms, and perceived behavioral control; the latter two constructs are specific to TPB and are not part of the model tested in the present study. Consistent with TAM, the current research retains attitude as the sole proximal antecedent of students' intention to use AI applications for learning an additional foreign language (INT). In education, many studies have shown that students' intention to use technology-based learning tools is closely related to their attitude toward those tools.

H3: Attitude (ATT) positively influences students' intention to use AI applications for learning an additional foreign language (INT).

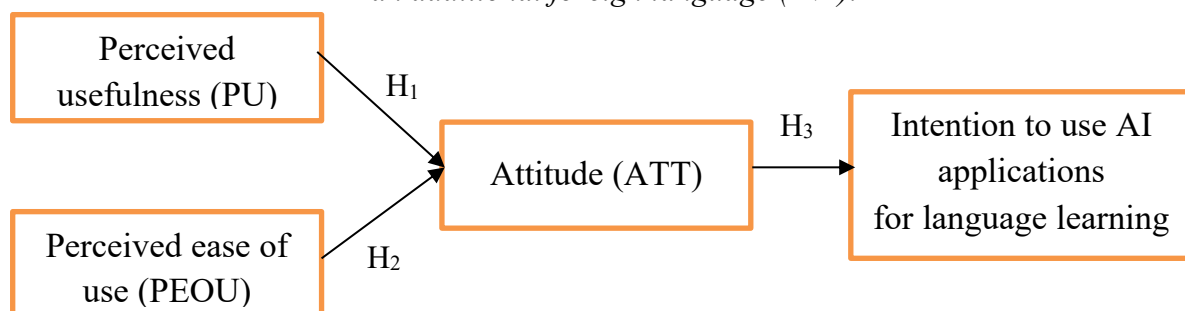


Figure 1. *Proposed research model*

3. Methodology

Data were collected online between March and May 2026 from undergraduate students enrolled in the Faculty of Commerce and Tourism at the University of Finance - Marketing (UFM), Ho Chi Minh City, Vietnam. A convenience, non-probability sampling approach was used: the online questionnaire was distributed through class groups and student networks, and

participation was restricted to students who had prior experience using at least one AI application (e.g., ChatGPT, Google Gemini, Duolingo, or Talkpal AI) to support their learning of an additional foreign language other than English (Chinese, Korean, or Japanese). We sent 320 invitations, retained 300 valid responses, and achieved a response rate of 93.75%. The questionnaire was administered in Vietnamese; all scale items were translated from their original English sources using a forward–backward translation procedure and pretested with a small pilot sample of 20 to assess clarity before formal data collection. Participation was voluntary and anonymous; respondents were informed of the study's purpose and provided consent before completing the survey. No personally identifying information was collected, and data were stored securely and used only for research purposes.

The demographic characteristics of the survey sample are as follows: Gender: Male (37.3%), Female (62.7%); Student Type: Second-year students (29%), Third-year students (48.3%), Fourth-year students (23.7%); Additional Foreign Language Studied: Chinese (65.3%), Korean (15%), Japanese (19.7%).

The research scales were designed based on qualitative findings and a review of previous studies to inform their development and refinement. Specifically, the scales for Perceived Usefulness (3 observed variables) and Perceived Ease of Use (4 observed variables) were adopted from Davis (1989) and Malik et al. (2021). The Attitude scale (5 observed variables) was adopted from Mendez (2018) and Gardner (1985). The Intention scale (4 observed variables) was adopted from Malik et al. (2021) and Terblanche & Kidd (2022). All items, together with their exact wording, source, and Vietnamese translation, are reported in Appendix B. The scales were evaluated on a 5-point Likert scale. Because all constructs were measured through a single self-administered questionnaire, we conducted Harman's single-factor test to assess common method bias; results indicated that the first factor accounted for 32.47% of the total variance, below the 50% threshold, suggesting that common method bias was not a major concern.

This study uses PLS-SEM via SmartPLS 4 to analyze students' intention to use AI applications for learning an additional foreign language. We assessed the research model in two steps: measurement model assessment and structural model assessment. We used bootstrapping with 5000 resamples and a bias-corrected and accelerated (BCa) 95% confidence interval to test the significance of path coefficients, and blindfolding ($D = 7$) to assess the predictive relevance (Q^2) of the endogenous constructs.

4. Analysis and results

4.1. Validation of the measurement model

Table 1: Results of reliability and convergent validity of the scale

Constructs	Items	Outer Loading	CR	AVE	Cronbach's α	rho_A
Perceived usefulness (PU)	03	0.820 – 0.925	0.861	0.784	0.861	0.866
Perceived ease of use (PEOU)	04	0.818 – 0.960	0.923	0.815	0.923	0.928

Constructs	Items	Outer Loading	CR	AVE	Cronbach's α	rho_A
Attitude (ATT)	05	0.816 – 0.948	0.924	0.768	0.924	0.930
Intention to use AI applications for learning an additional foreign language (INT)	04	0.779 – 0.936	0.897	0.765	0.897	0.940

From Table 1, the Outer Loading (index > 0.7), CR (index > 0.7), and AVE (index > 0.5) indices all meet the required values. Therefore, the proposed scales in the research model all achieve convergent validity.

The study evaluates the discriminant validity of the scale's components using the Heterotrait–Monotrait ratio (HTMT). Following Kline (2015), HTMT values should remain below 0.85. As shown in Table 2, all HTMT values fall below this threshold, except for the PEOU–PU ratio (0.844), which is close to it. Although 0.844 remains within the conventional cut-off, its proximity to the threshold indicates that perceived ease of use and perceived usefulness are empirically closely related constructs in this sample; this proximity, and its implications, are discussed further in the Discussion section. Full HTMT results are reported in Appendix E.

Table 2: HTMT index

	PEOU	PU	ATT	INT
PEOU				
PU	0.844			
ATT	0.712	0.701		
ITT	0.603	0.636	0.633	

4.2. Testing the structural model

The research results show that the SRMR coefficient is $0.069 < 0.08$; therefore, the proposed structural model fits the data acceptably.

Table 3: Collinearity and effect-size (f^2) statistics

Path	VIF	f^2
PU → ATT	1.681	0.257
PEOU → ATT	1.957	0.634
ATT → INT	1.928	0.545

Table 4: Explained variance (R^2) and predictive relevance (Q^2)

Endogenous construct	Adjusted R^2	Q^2
Attitude (ATT)	0.659	0.730
Intention (INT)	0.350	0.258

The results in Table 3 show that the collinearity statistics for all three structural paths ($VIF < 3$) indicate that the model does not exhibit multicollinearity. The effect size (f^2) of PU on ATT is 0.257 (a medium effect); the f^2 values of PEOU on ATT (0.634) and of ATT on INT (0.545) both exceed 0.35 (a large effect).

As reported in Table 4, the adjusted R^2 of Attitude (ATT) is 0.659, indicating that 65.9% of the variance in Attitude is explained by Perceived Ease of Use and Perceived Usefulness; the adjusted R^2 of students' intention to use AI applications for learning an additional foreign language (INT) is 0.350, indicating that Attitude explains 35.0% of the variance in intention. This latter value is moderate rather than substantial, suggesting that factors beyond attitude - such as subjective norms, self-efficacy, or trust in AI, which fall outside the scope of the TAM-only model tested here - may also contribute to students' intention; this is discussed further below.

Based on the test results, the study formed a structural model as shown in Figure 2. The path coefficients show that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) both significantly affect Attitude (ATT), and that Attitude (ATT) significantly affects students' intention to use AI applications for learning an additional foreign language (INT).

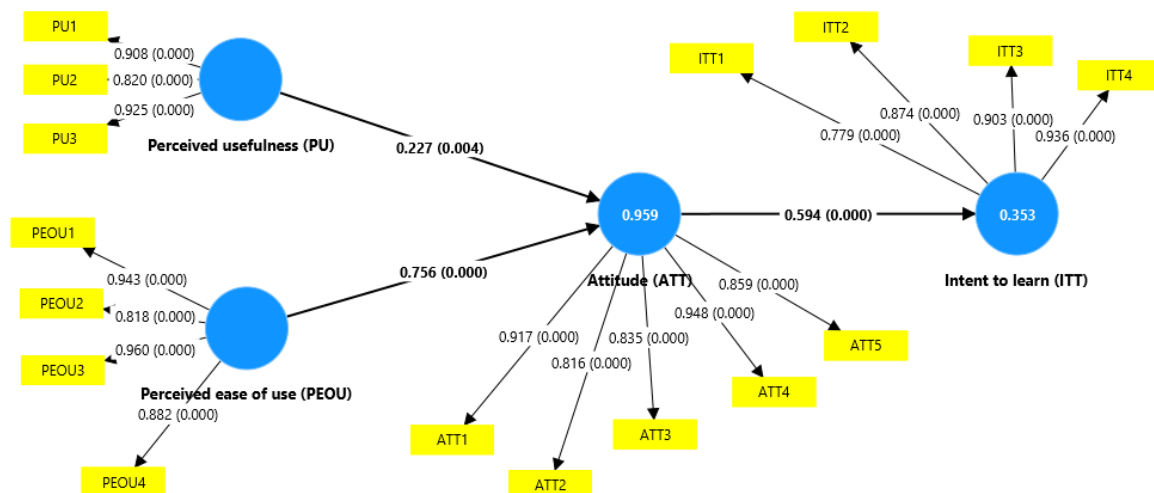


Figure 2. *Structural model results*

Table 5 presents the hypothesis test results, showing that hypotheses H1 to H3 are all supported.

Table 5: *Results of hypothesis testing*

Hypothesis	Relationship	Original Sample (O)	Sample Mean (M)	T - Value	P - Values	Conclusion
H ₁	PU -> ATT	0.227	0.240	2.876	0.004	Accepted
H ₂	PEOU -> ATT	0.756	0.743	9.554	< 0.01	Accepted
H ₃	ATT -> INT	0.594	0.595	13.758	< 0.01	Accepted

The findings provide additional empirical support for the Technology Acceptance Model (TAM) by confirming that both perceived usefulness (PU) and perceived ease of use (PEOU) contribute to shaping students' attitudes toward using AI applications for additional-language learning. However, the results reveal that perceived ease of use exerts a substantially stronger influence than perceived usefulness. This suggests that, in the context of AI-assisted language learning, students are more likely to develop favorable attitudes when AI applications are intuitive, easy to navigate, and require minimal effort. For many learners, particularly those still becoming familiar with AI technologies, ease of interaction may be the first condition for technology acceptance before its educational benefits can be fully appreciated. This finding is consistent with Davis (1989), who argued that technologies requiring less cognitive effort are more readily accepted by users. Similar evidence has also been reported in recent studies on AI-supported learning, where perceived ease of use was identified as a key determinant of students' attitudes toward educational technologies (Ma et al., 2024; Songkram et al., 2023).

Although perceived usefulness also has a positive and significant effect on attitude, its influence is comparatively weaker than that of perceived ease of use. This finding suggests that students acknowledge the learning benefits of AI applications, such as personalized feedback, language practice, and immediate access to learning resources, but these benefits may not be fully realized unless the applications are simple and easy to use. A similar pattern has been reported in higher education research, where students often place greater emphasis on the ease of interacting with AI systems than on their functional capabilities (Ma et al., 2024; Songkram et al., 2023).

The study also provides evidence that attitude significantly predicts students' intention to use AI applications for learning an additional foreign language. Students who hold more positive attitudes toward AI-assisted learning report a stronger intention to integrate these technologies into their learning activities. This result is consistent with previous research emphasizing the central role of attitude in shaping learners' behavioral intentions (Ivanov et al., 2024; Roy et al., 2022). Two further points warrant discussion. First, the moderate explained variance in intention (adjusted $R^2 = 0.350$) suggests that attitude alone captures only part of the variance in students' intention to use AI applications for language learning; unmeasured factors such as subjective norms, self-efficacy, trust in AI, or digital literacy may also play a role, consistent with the TAM-only scope of the model. Second, the HTMT ratio of 0.844 between PEOU and PU - close to the conventional 0.85 threshold - suggests that students in this sample may not sharply differentiate between how easy an AI application is to use and how useful it is; this could also reflect similarities across the specific AI tools (chatbots, Duolingo-type applications, pronunciation tools) and target languages (Chinese, Korean, Japanese) that respondents had in mind when answering. Because the survey did not ask respondents to anchor their responses to one specific application or language, potential variation in perceptions across tools and languages could not be examined and is left for future research. As this study measures behavioral intention rather than actual application use or subsequent learning outcomes (e.g., proficiency gains, as directly examined in studies such as Feng, 2025), these findings should not be interpreted as evidence that AI applications improve foreign-language learning effectiveness; from a practical perspective, they instead suggest that universities and educators should ensure that AI applications are accessible, user-friendly, and easy for students to

integrate into their daily learning routines, while separately evaluating their actual impact on learning outcomes.

5. Conclusion and implication

5.1. Conclusion

This study applied the Technology Acceptance Model (TAM) to develop and test a research model examining the effects of perceived ease of use (PEOU) and perceived usefulness (PU) on students' attitudes (ATT), and the effect of ATT on students' intention to use AI applications for learning an additional foreign language (INT). All three hypotheses were supported: PEOU and PU both positively affect ATT, with PEOU showing the stronger effect ($\beta = 0.756$) relative to PU ($\beta = 0.227$); and ATT positively affects INT ($\beta = 0.594$). These results indicate that when students perceive AI-assisted language-learning tools as easy to use and useful, they are more likely to hold favorable attitudes and, in turn, report a stronger intention to use these tools. Because the design is cross-sectional, relies on self-reported perceptions, and draws on a convenience sample of students who had already adopted AI applications, these findings should be interpreted as evidence about the antecedents of behavioral intention among current users rather than as proof of actual adoption or improved learning outcomes. Within this scope, the study extends the application of TAM to AI-assisted additional-language learning and provides universities with an evidence base for designing strategies to support the adoption of AI technologies in foreign-language teaching.

5.2. Implication

Given that perceived ease of use exerted the strongest influence on attitude, efforts to promote AI-assisted language learning should prioritize the usability of these tools and students' AI literacy - their ability to operate, evaluate, and productively integrate AI applications into their learning - rather than promotional messaging about learning benefits alone. Because this study measured behavioral intention rather than actual learning outcomes, institutions are also encouraged to pair the promotion of AI tools with a systematic evaluation of their impact on students' language proficiency and learning process, so that adoption efforts are grounded in evidence of educational effectiveness rather than intention alone. Based on these findings, the following recommendations are proposed:

- (1) At the institutional level, faculties should organize hands-on workshops and training sessions that build students' AI literacy - covering how to operate AI-powered language-learning applications, evaluate the quality of AI-generated content, and use these tools responsibly and effectively - rather than only introducing the applications' existence.
- (2) Foreign-language lecturers should integrate well-understood, easy-to-use AI applications into their teaching activities, model their effective use, and support students in evaluating how these tools affect their actual learning progress, so students can build confidence and a positive orientation toward using them.
- (3) Students are encouraged to take an active role in developing their AI literacy and digital learning skills, seeking out training opportunities, and regularly reflecting on whether their use of AI applications is translating into real improvements in their language learning, rather than relying on intention alone.

5.3. Limitations and future research.

Several limitations should be acknowledged when interpreting this study's findings. The data were obtained from students at a single university, which may reduce the extent to which the results can be generalized to other educational contexts. In addition, the research model was developed primarily from the Technology Acceptance Model (TAM) and did not account for other individual, social, or environmental factors - such as subjective norms or perceived behavioral control, which are central to the Theory of Planned Behavior but were not tested here - that may also influence students' adoption of AI applications. Another limitation is the cross-sectional survey design, which captures respondents' perceptions at one point in time and therefore does not allow changes in behavioral intention to be examined over time. Because participation was restricted to students who had already used AI applications for language learning, the sample may not represent the perceptions of non-users, and the findings may be subject to self-selection bias. All constructs were measured through self-reported perceptions collected at a single point in time, which raises the possibility of common method bias, and the study did not assess students' actual use of AI applications or their resulting language-learning outcomes; these should be examined directly in future research, for example using objective usage logs or pre/post proficiency measures. Future research could also broaden the scope by including participants from different universities and academic disciplines, comparing various AI-assisted language-learning platforms, and incorporating additional constructs such as subjective norms, trust, or self-efficacy. Longitudinal studies would better explain how students' acceptance and use of AI technologies evolve throughout their learning process.

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Author contributions (CRediT):

Hanh Phuc Nguyen Pham: Substantially contributed to the conception and design of the study, data collection, data analysis, and interpretation of the findings; drafted the original manuscript; critically revised the manuscript for important intellectual content.

Phung Vu Bao Ngoc (Corresponding Author): Substantially contributed to the study conception and design, supervised the research, interpreted the findings, critically revised the manuscript, managed journal correspondence, approved the final version, and accepted responsibility for the integrity and accuracy of the work.

Vu Van Anh: approved the final version of the manuscript for publication and agreed to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

Conflicts of interest: The authors declare no conflicts of interest.

Ethics approval and consent to participate: Formal ethical approval was not required for this study under the relevant institutional guidelines. Participation in the survey was voluntary, and we collected no personally identifiable information. Before completing the questionnaire, participants were informed of the study's purpose, their voluntary participation, and their right to decline participation. We obtained informed consent from all participants before data collection.

Data availability: The dataset generated and analyzed during the current study is available from the corresponding author upon reasonable request.

Declaration of generative AI use: During manuscript preparation, authors used ChatGPT to improve readability, grammar, and language quality, as well as to assist with translation. Authors reviewed, edited, and took full responsibility for the final content.

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Appendix A. Item-level outer loadings

Construct	Item	Outer loading
Perceived usefulness (PU)	PU1	0.880
Perceived usefulness (PU)	PU2	0.791
Perceived usefulness (PU)	PU3	0.747
Perceived ease of use (PEOU)	PEOU1	0.943
Perceived ease of use (PEOU)	PEOU2	0.818
Perceived ease of use (PEOU)	PEOU3	0.960
Perceived ease of use (PEOU)	PEOU4	0.882
Attitude (ATT)	ATT1	0.917
Attitude (ATT)	ATT2	0.815
Attitude (ATT)	ATT3	0.835
Attitude (ATT)	ATT4	0.948
Attitude (ATT)	ATT5	0.859
Intention (INT)	INT1	0.779
Intention (INT)	INT2	0.874
Intention (INT)	INT3	0.903
Intention (INT)	INT4	0.936

Appendix B. Item wording, source, and translation

Item code	Original source	Source	English wording
PU1	Using X for learning enables me to achieve my objectives effectively	Davis, 1989 Malik et al., 2021	Using AI applications for learning enables me to achieve my objectives effectively

PU2	Using X for learning improves my performance	Davis, 1989 Malik et al., 2021	Using AI applications for learning improves my performance
PU3	Using X for learning is useful for accessing information	Davis, 1989 Malik et al., 2021	Using AI applications for learning is useful for accessing information
PEOU1	Using X for learning would be easy for me	Davis, 1989 Malik et al., 2021	Using AI applications for learning would be easy for me
PEOU2	Using X for learning requires less mental effort	Davis, 1989 Malik et al., 2021	Using AI applications for learning requires less mental effort
PEOU3	Learning is easy and comprehensive with X	Davis, 1989 Malik et al., 2021	Learning is easy and comprehensive with AI applications
PEOU4	I can easily become skilled at using X for learning	Davis, 1989 Malik et al., 2021	I can easily become skilled at using AI applications for learning
ATT1	I enjoy learning new aspects of the X language	Mendez, L. (2018) Gardner (1985)	I enjoy learning new aspects of an additional foreign language
ATT2	I feel that learning X is an interesting and engaging process.	Mendez, L. (2018) Gardner (1985)	I feel that learning an additional foreign language is an interesting and engaging process.
ATT3	I believe that mastering X will make me a better communicator.	Mendez, L. (2018) Gardner (1985)	I believe that mastering an additional foreign language will make me a better communicator.
ATT4	I view challenges in learning X as opportunities for growth	Mendez, L. (2018) Gardner (1985)	I view challenges in learning an additional foreign language as opportunities for growth
ATT5	I have a positive outlook on my ability to learn X	Mendez, L. (2018) Gardner (1985)	I have a positive outlook on my ability to learn an additional foreign language
INT1	I use X for learning	Malik et al., 2021 Terblanche & Kidd, 2022	I use AI applications for learning
INT2	I will continue using X for learning	Malik et al., 2021 Terblanche & Kidd, 2022	I will continue using AI applications for learning
INT3	I plan to use X for learning in the next semester	Malik et al., 2021 Terblanche & Kidd, 2022	I plan to use AI applications for learning in the next semester
INT4	I would recommend X to a friend for learning purposes	Malik et al., 2021 Terblanche & Kidd, 2022	I would recommend AI applications to a friend for learning purposes

Appendix C. Participant information and consent statement (template)

Dear Participant,

You are invited to take part in the study “University students’ intentions to use AI applications for learning an additional foreign language: A TAM study in Vietnam.” The study explores students’ perceptions and intentions to use AI applications for learning an additional foreign language.

The survey is voluntary and anonymous and takes about 5–10 minutes to complete. You may stop at any time without any penalty. No identifying information will be collected, and your responses will be used only for academic research and reported in aggregate form. The survey data were collected during May and June 2026 and will be stored securely and accessed only by the research team.

If you have any questions about the study, please contact Hanh Phuc Nguyen Pham and colleagues at the University of Finance – Marketing at phucnguyen_kdl@ufm.edu.vn.

By continuing to the questionnaire, you confirm that you have read the information above and voluntarily agree to participate in the study.

☐ I agree to participate in this study.

Appendix D. SmartPLS / bootstrapping configuration

Software and version	SmartPLS 4 (v.4.1.0.9)
Estimation algorithm	PLS-SEM – Path weighting scheme
Bootstrapping subsamples	5,000
Confidence interval method	Percentile bootstrap, 95%
Blindfolding omission distance (D)	D = 7
Missing data treatment	No missing data were identified

Appendix E. Full HTMT matrix

	PEOU	PU	ATT	INT
PEOU				
PU	0.844			
ATT	0.712	0.701		
INT	0.603	0.636	0.633	

Constructs	HTMT	95% CI
PU – PEOU	0.281	[0.165, 0.402]
ATT – PEOU	0.530	[0.420, 0.640]
ATT – PU	0.273	[0.167, 0.391]
ITT – PEOU	0.603	[0.503, 0.698]
ITT – PU	0.139	[0.095, 0.249]
ITT – ATT	0.633	[0.536, 0.727]