



## Exploring The Effect of Self-Efficacy on Technological Acceptance of Artificial Intelligence Usage in L2 Education: A SEM-PLS Analysis

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### ABSTRAK

Meskipun kecerdasan buatan (AI) telah terintegrasi dengan cepat ke dalam pendidikan bahasa, faktor-faktor psikologis yang mendorong penerimaan AI di kalangan pelajar tingkat menengah masih kurang dipahami, terutama dalam konteks negara berkembang di mana kerangka kerja tata kelola AI yang etis masih kurang berkembang. Studi ini meneliti pengaruh Efikasi Diri (SE) terhadap *Perceived Ease of Use* dan *Perceived Usefulness* dari alat-alat AI dalam kerangka *Technology Acceptance Model* di antara pelajar bahasa asing tingkat SMP dan SMA di Indonesia. Dengan menggunakan desain survei kuantitatif non-eksperimental, data dikumpulkan dari 63 siswa sekolah menengah dengan pengalaman langsung sebelumnya menggunakan alat bahasa berbasis AI. Instrumen yang digunakan mengadaptasi kuesioner TAM Davis (1986) dan skala efikasi diri Bandura (1997), yang hanya terdiri dari satu item yang dioperasionalkan untuk konteks pembelajaran yang dibantu AI, dan dianalisis melalui PLS-SEM menggunakan SmartPLS 4.0. Hasil model pengukuran mengonfirmasi reliabilitas yang memuaskan ( $CR \geq 0,899$ ; Cronbach's  $\alpha \geq 0,826$ ) dan validitas ( $AVE \geq 0,748$ ; HTMT  $< 0,90$ ) di seluruh konstruk. Analisis model struktural mengungkapkan bahwa SE secara signifikan dan positif memprediksi PE ( $\beta = 0,660$ ,  $f^2 = 0,772$ ) dan PU ( $\beta = 0,591$ ,  $f^2 = 0,536$ ), dengan model tersebut menjelaskan 43,6% dan 34,9% varians pada PE dan PU, masing-masing. Temuan ini memperluas TAM dengan menetapkan efikasi diri sebagai antecedent psikologis yang kuat terhadap penerimaan teknologi AI dan merupakan studi pertama yang mengintegrasikan penggunaan AI yang etis, model prediktor efikasi diri, dan konteks pendidikan bahasa asing tingkat menengah di Indonesia. Implikasi untuk desain kurikulum, pelatihan guru, dan kebijakan AI inklusif dibahas.

**Kata Kunci:** AI, Pembelajaran Bahasa Asing, Efikasi Diri, Model Penerimaan Teknologi, SEM-PLS

### ABSTRACT

Despite the rapid integration of Artificial Intelligence (AI) into language education, the psychological factors driving AI acceptance among secondary-level learners remain poorly understood, particularly in developing-country contexts where ethical AI governance frameworks are underdeveloped. This study examined the effect of Self-Efficacy (SE) on Perceived Ease of Use (PE) and Perceived Usefulness (PU) of AI tools within the Technology Acceptance Model (TAM) framework among junior and senior high school foreign language learners in Indonesia. Using a quantitative, non-experimental survey design, data were collected from 63 secondary school students with direct prior experience using AI-based language tools. The instrument adapted Davis's (1986) TAM questionnaire and Bandura's (1997) self-efficacy scale, comprising just one item operationalised for AI-assisted learning contexts, and was analysed via Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 4.0. Measurement model results confirmed satisfactory reliability ( $CR \geq 0.899$ ; Cronbach's  $\alpha \geq 0.826$ ) and validity ( $AVE \geq 0.748$ ; HTMT  $< 0.90$ ) across all constructs. Structural model analysis revealed that SE significantly and positively predicted both PE ( $\beta = 0.660$ ,  $f^2 = 0.772$ ) and PU ( $\beta = 0.591$ ,  $f^2 = 0.536$ ), with the model explaining 43.6% and 34.9% of variance in PE and PU, respectively. These findings extend TAM by establishing self-efficacy as a robust psychological antecedent of AI technology acceptance and constitute the first study to integrate ethical AI use, a self-efficacy predictor model, and the secondary foreign language education context in Indonesia. Implications for curriculum design, teacher training, and inclusive AI policy are discussed.

**Keywords:** AI, L2 Education, Self-Efficacy, Technology Acceptance Model, SEM-PLS

## 1. INTRODUCTION

The rapid pace of global change in the 21st century demands that the ability to continue learning independently outside of formal education becomes more important (Little, 1999; Mohebbi, 2025). These changes have mainly occurred in technology, one of which is the emergence of Artificial Intelligence (AI), especially in language education. AI has the ability to provide adaptive learning experiences and has been proven to improve human language skills (Mohebbi, 2025). In addition, AI-powered tools support adaptive learning, automated assessment, and interactive tutoring, opening up a wide range of possibilities for both formal classroom instruction and informal language acquisition (Vo, 2025; Li et al., 2025). The increasing reliance on AI in language education demands a deeper exploration of the factors that influence learners' acceptance and effective use of this technology.

The most widely used theoretical framework for the acceptance and use of innovative technology is the Technology Acceptance Model (TAM) Davis (1986). TAM stands as the leading model for predicting and explaining user acceptance (Davis & Granić, 2024; Abolle-Okoyeagu et al., 2026). It states that TAM has two core beliefs: Perceived usefulness (PU) and Perceived ease-of-use (PE). In the context of language learning, Perceived Usefulness (PU) refers to students' belief that using AI can improve the effectiveness and efficiency of their tasks. Meanwhile, Perceived Ease of Use (PE) refers to students' belief that AI can be used easily without physical or mental burden (Davis, 1986; Aljarrah et al., 2016). Therefore, analyzing students' acceptance of AI using the TAM can create opportunities for building new models.

Self-efficacy is defined as an individual's belief in their ability to perform a behavior in a given situation (Bandura, 1997). In AI-assisted language education, self-efficacy specifically refers to students' confidence in using AI tools ethically and effectively (Jiang, 2024; Morales-García et al., 2025). Nikolopoulou et al. (2021) and Espinoza-Bravo et al. (2025) argue that when students feel satisfied with the results of AI-assisted tasks, their willingness to use these tools increases substantially. Furthermore, the interactive nature of AI tools can also make the learning process more enjoyable and less burdensome (Yilmaz & Karaoglan Yilmaz, 2023).

This study highlights significant gaps in ethical frameworks related to AI applications in secondary education. Some of the identified issues include the inability to address privacy concerns, bias in AI algorithms, weak accountability mechanisms, and a lack of transparency in AI decision-making in educational contexts (Ofosu-Asare, 2025). Furthermore, a review of AI ethics in education (2020–2024) revealed gaps in ethical structures designed for K-12 and secondary education, with most governance structures geared more toward higher education and failing to address the unique vulnerabilities of younger students (Yan et al., 2025). This study emphasizes the importance of understanding self-efficacy in ethical AI adoption among secondary-level foreign language learners in Indonesia, which is both academically and socially relevant.

Empirical research on AI adoption in education continues to grow. First, Kai et al. (2026) developed a TAM-UTAUT model to explore AI anxiety among Chinese lecturers and students, with self-efficacy as a significant moderator that can help manage anxiety and enhance constructive engagement. Second, Nurtanto et al. (2025) found that perceived usefulness, subjective norms, and enabling conditions were significant predictors of AI adoption intention among Indonesian students, although their focus was limited to higher education. Third, Valle et al. (2024) investigated 886 Filipino students and found that social influence and AI knowledge were the main predictors of attitudes toward AI, with performance expectancy as the driver of behavioral intention.

This study introduces significant novelty by examining the simultaneous effects of self-efficacy on students' behavioral intention to use ethical AI, specifically in foreign language education at the secondary level. This is the first study to combine (1) ethical AI use, (2) a self-efficacy predictor model, and (3) the context of secondary foreign language education in Indonesia, extending TAM theory with Bandura's self-efficacy construct and affect-based engagement theory. This research not only enriches TAM theory but also contributes to the call for research linking AI adoption to social justice agendas in global education and provides a model that can be replicated in comparative studies in other developing countries.

This study aims to examine the influence of self-efficacy on the perceived usefulness and ease of use of AI within the TAM framework among junior and senior high school foreign language learners in Indonesia. Furthermore, this study analyzes how these variables influence students' behavioral intentions toward ethical AI use and identifies practical applications for curriculum and teacher training. Its practical benefits include extending TAM with psychological constructs in the secondary school context, while providing

guidance for policymakers, curriculum developers, and teachers in designing inclusive AI interventions. Socially, this research supports global efforts to ensure that AI-based educational transformations do not promote inequality among learners.

## 2. METHOD

### 2.1. Participant

Participants in this study were junior high school (SMP) and senior high school (SMA) students in Indonesia who were currently or had previously studied at least 32 hours of foreign language lessons, including English, Arabic, Japanese, and other foreign languages. Participants were eligible if they had direct experience using AI-based tools in their language learning activities, such as ChatGPT, an AI translation application, an AI-powered vocabulary trainer, or an AI writing assistant. Students without prior exposure to AI tools in language learning were excluded from this study. A total of 63 students participated in this study, comprising learners from both junior high school and senior high school levels across public and private schools.

### 2.2. Research Design

This study employed a quantitative, non-experimental survey design. Participants were not placed in a manipulated condition; instead, they were observed naturally through self-reported responses to a structured questionnaire. The study followed a between-subjects design, in which each participant responded independently without any experimental intervention or treatment. Participants were selected using stratified random sampling, with stratification applied across school level (junior high and senior high) and school type (public and private) to ensure proportional representation across subgroups.

### 2.3. Procedure and Instrumentation

Data were collected through a closed-ended questionnaire using a five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree) (Koo & Yang, 2025). This instrument was adapted from the established TAM-based questionnaire (Davis, 1986) and supplemented with items measuring self-efficacy (Bandura, 1997). The questionnaire was distributed digitally via Google Forms, accompanied by a brief explanation of the study's purpose and a statement of consent. The Self-Efficacy (SE) subscale comprised one item adapted from Bandura's (1997) self-efficacy framework and operationalised for AI-assisted language learning contexts, following the adaptation approach of Morales-García et al. (2025). Representative items included: "I am confident in my ability to use AI tools effectively for language learning". The TAM subscales for Perceived Ease of Use (PE) comprised three items (PE1-PE3) and Perceived Usefulness (PU) comprised two items (PU1-PU2), all adapted from Davis (1986).

### 2.4. Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. The structural model hypothesizes that Self-Efficacy (SE) influences both Perceived Ease of Use (PE) and Perceived Usefulness (PU), and that PE further influences PU, consistent with the extended TAM framework.

In Stage 1 (Measurement Model), the reliability and validity of the three reflective constructs (SE, PE, PU) were assessed. Indicator reliability was evaluated through outer loading values (threshold  $\geq 0.70$ ) (Savitri et al., 2021), internal consistency through Cronbach's alpha ( $\alpha \geq 0.70$ ) and composite reliability (CR  $\geq 0.70$ ) (Savitri et al., 2021), convergent validity through Average Variance Extracted (AVE  $\geq 0.50$ ), and discriminant validity through the Heterotrait-Monotrait ratio (HTMT  $< 0.90$ ).

In Stage 2 (Structural Model), the hypothesized relationships among SE, PE, and PU were examined. Path coefficients ( $\beta$ ) were estimated and tested for significance, and the coefficient of determination ( $R^2$ ) was used to assess how well the exogenous constructs explain the endogenous constructs. The effect size ( $f^2$ ) was then examined to determine the relative contribution of each predictor to the endogenous constructs. Statistical robustness of the estimates was assessed using bootstrapping with 5,000 resamples. The following is the hypothesis of this study:

- a. H2: Self-Efficacy (SE) has a positive and significant effect on Perceived Ease of Use (PE) in using AI for foreign language learning.

- b. H3: Self-Efficacy (SE) has a positive and significant effect on Perceived Usefulness (PU) in using AI for foreign language learning.

### 3. RESULTS AND DISCUSSIONS

#### 3.1. Results

##### 3.1.1. Evaluation of the Reflective Measurement Model (Outer Model)

This section presents the results of the measurement model evaluation to assess the validity and reliability of all constructs. The outer model analysis examined convergent validity through Average Variance Extracted (AVE) and outer loadings, internal consistency through Cronbach’s alpha and Composite Reliability (CR), and discriminant validity through the Heterotrait-Monotrait (HTMT) ratio. All threshold values follow the criteria established in the Data Analysis section.

**Table 1. Convergent validity**

AVE (> 0.50)	Outer Loading (≥ 0.70)
<b>AVE PE = 0.748</b>	PE1=0.907
	PE2=0.867
	PE3=0.818
<b>AVE PU = 0,851</b>	PU1=0.937
	PU2=0.908

As shown in Table 1, all outer loading values exceeded the minimum threshold of 0.70, ranging from 0.818 (PE3) to 0.937 (PU1), indicating that each indicator reliably reflected its respective construct. The AVE for PE was 0.748 and for PU was 0.851, both surpassing the 0.50 threshold, confirming adequate convergent validity. These findings indicate that the measurement items sufficiently captured the variance of their intended constructs. The reliability of the measurement model was then assessed as presented in Table 2.

**Table 2. Reliability test**

Variabel	Composite Reliability (≥ 0.70)	Cronbach’s Alpha (≥ 0.70)
<b>Perceived Ease of Use (PE)</b>	0.899	0.838
<b>Perceived Usefulness (PU)</b>	0.920	0.826

Table 2 demonstrates that both constructs exhibit high internal consistency. The Composite Reliability (CR) values were 0.899 for PE and 0.920 for PU, while Cronbach’s alpha values were 0.838 and 0.826 respectively, all well above the minimum threshold of 0.70. These values confirm that the measurement items consistently reflected their intended constructs. Discriminant validity was subsequently evaluated using the HTMT criterion, as presented in Table 3.

**Table 3. Discriminant validity (HTMT <0.90)**

Variabel	HTMT	Keterangan
<b>Perceived Usefulness (PU) ↔ Perceived Ease of Use (PE)</b>	0.899	H <sub>1</sub> =Accepted
<b>Self-Efficacy (SE) ↔ Perceived Ease of Use (PE)</b>	0.679	H <sub>2</sub> =Accepted
<b>Self-Efficacy (SE) ↔ Perceived Usefulness (PU)</b>	0.645	H <sub>3</sub> =Accepted

As shown in Table 3, all HTMT values were below the 0.90 threshold, confirming that each construct is empirically distinct from the others. Specifically, the HTMT value between PU and PE was 0.899 (within an acceptable range), between SE and PE was 0.679, and between SE and PU was 0.645. Taken together, the results of the outer model evaluation confirm that all constructs demonstrate adequate reliability, convergent validity, and discriminant validity, providing a sound basis for proceeding to structural model analysis.

**3.1.2. Evaluation of the Reflective Structural Model (Inner Model)**

Following confirmation of the measurement model, the structural model was evaluated to examine the hypothesized relationships among Self-Efficacy (SE), Perceived Ease of Use (PE), and Perceived Usefulness (PU). This section presents the coefficient of determination ( $R^2$ ), effect sizes ( $f^2$ ), and path coefficients ( $\beta$ ) derived from the PLS-SEM analysis using 5,000 bootstrap resamples.

**Table 4. R-square ( $R^2$ )**

Variabel	$R^2$ -Square
Perceived Ease of Use (PE)	0.436
Perceived Usefulness (PU)	0.349

As shown in Table 4, the  $R^2$  value for PE was 0.436, indicating that Self-Efficacy explains 43.6% of the variance in Perceived Ease of Use. The  $R^2$  value for PU was 0.349, meaning that 34.9% of the variance in Perceived Usefulness is accounted for by the predictor in the model. Both values reflect a moderate level of explanatory power, appropriate to the scope of this study. The practical contribution of each predictor was further examined using effect size analysis as presented in Table 5.

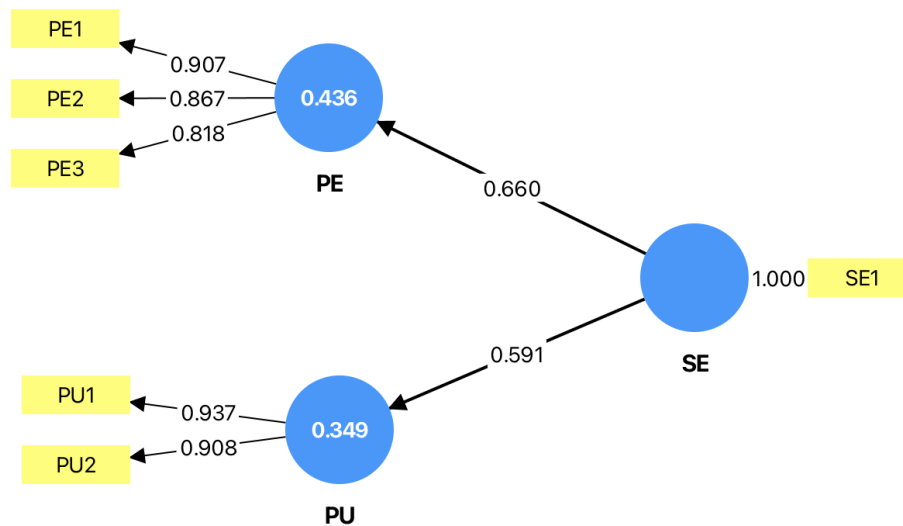
**Table 5. Effect size ( $f^2$ )**

Variabel	$f^2$	Keterangan
Self-Efficacy (SE) ↔ Perceived Ease of Use (PE)	0.772	High Effect
Self-Efficacy (SE) ↔ Perceived Usefulness (PU)	0.536	High Effect

Table 5 reveals that Self-Efficacy exerts a large effect size on both PE ( $f^2 = 0.772$ ) and PU ( $f^2 = 0.536$ ), substantially exceeding the conventional threshold of 0.35 for large effects. These results indicate that SE makes a practically significant contribution to explaining both TAM constructs, reinforcing its theoretical relevance as a predictor in the extended TAM model. The path coefficients and their significance were examined next, as presented in Table 6 and illustrated in Figure 1.

**Table 6. Path coefficients**

Variabel	$\beta$	Keterangan
Self-Efficacy (SE) ↔ Perceived Ease of Use (PE)	0.660	Significant
Self-Efficacy (SE) ↔ Perceived Usefulness (PU)	0.591	Significant



**Figure 1. Structural model**

As presented in Table 6 and illustrated in Figure 1, both path coefficients were statistically significant. The path from SE to PE ( $\beta = 0.660$ ) and from SE to PU ( $\beta = 0.591$ ) indicates that students with higher self-efficacy in using AI tools perceive AI as both easier to use and more useful in foreign language learning. The structural model further shows that SE accounted for a meaningful proportion of variance in both endogenous constructs. Consequently, H1 and H2 are both supported, demonstrating that self-efficacy is a robust psychological predictor of AI technology acceptance among secondary-level foreign language learners in Indonesia.

### 3.2. Discussions

This study examined the influence of self-efficacy (SE) on perceived ease of use (PE) and perceived usefulness (PU) of AI tools within the Technology Acceptance Model (TAM) framework, among secondary-level foreign language learners in Indonesia. The PLS-SEM results provided strong empirical support for both primary hypotheses: SE significantly and positively predicted both PE ( $\beta = 0.660$ ) and PU ( $\beta = 0.591$ ), with large effect sizes ( $f^2 = 0.772$  and  $f^2 = 0.536$ , respectively). These findings align with the foundational premise of Bandura's (1997) self-efficacy theory, which posits that individuals' confidence in their ability to perform specific tasks directly shapes their behavioral and cognitive orientations toward those tasks. In the context of AI-assisted language learning, these results suggest that students who hold stronger beliefs in their capacity to use AI tools ethically and effectively are more likely to perceive those tools as easy to operate and genuinely useful for improving their language proficiency.

The strong path coefficient from SE to PE ( $\beta = 0.660$ ) indicates that self-efficacy is a robust psychological antecedent of perceived ease of use in AI-assisted learning environments. This finding is consistent with a growing body of evidence demonstrating that confidence in using technology reduces cognitive friction (Czaja et al., 2006; Tan et al., 2024). In TAM-based research, perceived ease of use is often regarded as a function of both system design and user psychology (Lewis & Sauro, 2024); the present finding suggests that the user's self-belief may be at least as consequential as interface characteristics.

This is particularly relevant for secondary school learners who, unlike university students, may have had less systematic exposure to AI tools, making confidence-building a critical prerequisite for reducing technology-related barriers to adoption (Liu, 2025). Jiang (2024) similarly found that AI self-efficacy among learners shaped their perceptions of AI tools as approachable and manageable, reinforcing the notion that psychological readiness precedes technological acceptance across educational levels.

The significant relationship between SE and PU ( $\beta = 0.591$ ,  $f^2 = 0.536$ ) further extends existing TAM theory by confirming that self-efficacy does not merely ease the perceived burden of using AI but also elevates learners' beliefs about the value that AI can deliver to their learning outcomes. When students are confident in their AI-related abilities, they are better positioned to explore the deeper functionality of AI

tools, thereby uncovering their educational value in tasks such as language production, vocabulary acquisition, and grammar correction (Morales-García et al., 2025; Yilmaz & Karaoglan Yilmaz, 2023).

This aligns with Bandura's (1997) argument that self-efficacy functions as a motivational lens through which learners evaluate the instrumentality of new technologies. A student who believes they can effectively use ChatGPT or an AI vocabulary trainer is more likely to attribute genuine academic utility to those tools than one who feels apprehensive or incompetent. Xu et al. (2024) found parallel results among Chinese EFL students, reporting that higher self-efficacy in AI use was associated with stronger perceptions of ChatGPT's educational value, mediated through enjoyment of the foreign language learning experience.

The effect sizes obtained in this study ( $f^2 = 0.772$  for SE → PE and  $f^2 = 0.536$  for SE → PU) exceed the conventional threshold for large effects ( $f^2 \geq 0.35$ ), indicating that self-efficacy contributes substantially to the variance in both TAM constructs. The  $R^2$  values of 0.436 for PE and 0.349 for PU reflect a moderate-to-substantial predictive capacity for a model featuring a single exogenous predictor, a finding consistent with comparable PLS-SEM studies in extended TAM contexts (Espinoza-Bravo et al., 2025; Davis & Granić, 2024).

The remaining unexplained variance points to the plausible influence of other factors not captured in the present model, such as digital literacy, teacher support, peer norms, or institutional resources, all of which have been identified as relevant determinants of AI acceptance in prior literature (Nurtanto et al., 2025; Harsanti et al., 2025). Future research extending the model with these additional constructs would provide a more comprehensive picture of AI acceptance among secondary learners, while the current model's parsimony offers a clear and replicable baseline for subsequent investigations.

A central contribution of this study lies in its focus on secondary-level learners, a population that has been largely underrepresented in AI acceptance research, which has been dominated by higher education contexts (Li et al., 2025). Secondary school students present a distinct psychological and developmental profile compared to university students: they are typically younger, have had less autonomy in selecting their educational tools, and may face institutional constraints around AI use that differ from those in higher education.

The large effect of SE on both PE and PU observed in this study suggests that confidence-building may be even more critical at the secondary level, where students may not yet have internalized self-directed learning strategies or established stable technology-use habits. Wu et al. (2024) noted that EFL learners' behavioral intention to use AI was substantially influenced by their perceived competence, a finding that resonates with the developmental profile of secondary school learners. Correspondingly, Huang et al. (2024) found that generative AI acceptance was closely tied to self-efficacy perceptions among EFL learners, and that this relationship was amplified in younger, less experienced cohorts—a pattern congruent with the present study's results.

The Indonesian secondary school context introduces additional sociocontextual dimensions that enrich the interpretation of these findings. Indonesia features a highly heterogeneous educational landscape characterized by significant disparities in digital infrastructure between urban and rural areas (Nurtanto et al., 2025). The fact that self-efficacy emerged as a strong and significant predictor of AI acceptance among students from both public and private schools across urban and suburban settings suggests that psychological capital may operate as a compensatory mechanism for students with unequal access to technological infrastructure.

This finding resonates with discussions on digital equity in developing-country education, where self-efficacy interventions may serve as a cost-effective complement to hardware-oriented approaches to technology promotion. Harsanti et al. (2025) found that digital readiness and perceived usefulness shaped Indonesian teachers' AI adoption intentions, reinforcing the consistency of TAM-based dynamics across different actor groups within the Indonesian educational system. The current study complements this work by demonstrating that the same psychological mechanisms operate on the student side of the educational transaction, offering a holistic foundation for designing inclusive AI integration policies at the secondary level in Indonesia.

An important theoretical extension introduced in this study is the framing of AI acceptance not merely as a neutral technological behavior but as a value-laden practice with social and moral implications. Prior research has established that ethical AI governance frameworks for secondary education remain underdeveloped, with most existing guidelines oriented toward higher education or adult users (Ofosu-Asare, 2025). Wiczorek et al. (2025) systematically reviewed the ethics of AI use in primary and secondary education and concluded that students in these contexts are particularly vulnerable to risks associated with algorithmic bias, data privacy violations, and the erosion of cognitive autonomy.

The present study's finding that self-efficacy drives both perceived ease and usefulness of AI adoption suggests a promising pathway: students who are confident and competent in using AI are better positioned to use it reflectively and ethically, because competence supports the critical evaluation of AI outputs rather than passive acceptance. Gouseti et al. (2025) similarly argued that effective and responsible AI integration in K-12 education requires learners to develop not only technical skills but also the metacognitive confidence to exercise judgment when interacting with AI systems, a disposition that is fundamentally underpinned by self-efficacy.

#### 4. CONCLUSION

This study examined the influence of self-efficacy (SE) on secondary-level foreign language learners' perceived ease of use (PE) and perceived usefulness (PU) of AI tools within the TAM framework, using PLS-SEM with data from 63 junior and senior high school students in Indonesia. Both hypotheses were fully supported: SE significantly and positively predicted PE ( $\beta = 0.660$ ,  $f^2 = 0.772$ ) and PU ( $\beta = 0.591$ ,  $f^2 = 0.536$ ), with moderate-to-substantial explanatory power ( $R^2 = 0.436$  and  $R^2 = 0.349$ , respectively), confirming self-efficacy as a robust psychological antecedent of AI technology acceptance at the secondary level.

This study contributes to the field in three ways: it extends TAM by establishing self-efficacy as an upstream determinant of PE and PU; it is the first to jointly examine ethical AI use, a self-efficacy predictor model, and secondary foreign language education in Indonesia; and it demonstrates that psychological capital may partially compensate for infrastructural inequalities, advancing the discourse on digital equity in developing-country education.

Practically, these findings suggest that Indonesian secondary school foreign language programmes should embed structured, scaffolded AI activities to build learner self-efficacy through mastery experiences and peer modelling. Teacher training should incorporate ethical AI competence, and national AI education policy should address learners' psychological readiness alongside hardware provision. Future research should employ longitudinal designs, larger representative samples, and extended TAM models that include behavioural intention toward ethical AI use as a downstream construct.

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