



Exploring English Education Students' Self-Efficacy in Utilizing AI Tools for Language Learning

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ABSTRACT

This study explores English Education students' self-efficacy in utilizing Artificial Intelligence (AI) tools for language learning within the Indonesian higher education context. A sequential explanatory mixed-method design was employed. In the first phase, a quantitative descriptive survey was administered to 100 English Education students using an adapted version of the Teacher Artificial Intelligence Competence Self-efficacy (TAICS) scale. The instrument consisted of twenty items covering six constructs: AI Knowledge, AI Pedagogy, AI Assessment, AI Ethics, Human-Centred Education, and Professional Engagement. Descriptive statistical analysis revealed that students' overall self-efficacy was at a moderate level ($M = 3.53$), with the highest confidence observed in AI Knowledge and AI Pedagogy, while AI Ethics and Professional Engagement scored lowest. In the second phase, qualitative data were collected through semi-structured interviews with a purposive sub-sample of fifteen students and analyzed thematically. Five themes emerged: mastery experiences, vicarious experiences, social persuasion, ethical awareness, and affective states. These themes reflected the sources of self-efficacy proposed by Bandura and explained variations in students' confidence. The findings indicate that students are generally prepared to integrate AI tools for learning and future teaching, yet gaps remain in ethical confidence and professional engagement. The study suggests that teacher education programs should provide structured training, reflective practices, and ethical guidance to strengthen responsible AI use.

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INTRODUCTION

The rapid diffusion of AI across multiple domains of human life has brought profound transformations in education, particularly in language learning and teaching. In the last decade, the development of AI-powered technologies has accelerated at an unprecedented pace, reshaping how learners access knowledge, interact with learning materials, and produce academic outputs. Unlike traditional digital tools that mainly offer static resources, AI tools are characterized by their generative, adaptive, and interactive nature (Hastomo et al., 2025). These capabilities allow learners to receive personalized assistance, immediate feedback, and context-sensitive suggestions that were previously unavailable in conventional educational settings. In English language learning, the presence of AI tools such as ChatGPT, Grammarly, QuillBot, and AI-based translators has introduced new opportunities for students to enhance their writing skills, practice authentic communication, and receive real-time guidance on grammar, vocabulary, and discourse organization (Marzuki et al., 2023). This shift marks a new era in English Language Teaching (ELT), where technology not only supplements instruction but also transforms pedagogical practices and learner engagement.

Within the Indonesian higher education context, English Education programs are under increasing pressure to prepare students not only as proficient English users but also as competent future teachers who can navigate digital environments effectively. Students in these programs are expected to integrate technology into their teaching practice and to cultivate digital literacy that aligns with the demands of contemporary classrooms (Zulianti et al., 2024). The adoption of AI tools in language learning has therefore become highly relevant, as it exposes students to innovative ways of engaging with texts, developing critical awareness of language use, and experiencing how technology can mediate learning. At the same time, the presence of AI in higher education has triggered debates regarding issues of academic integrity, ethical awareness, and the risk of overdependence on automated feedback (Slamet, 2024). As such, understanding how students perceive their ability to use AI tools is essential in evaluating their readiness to integrate these technologies responsibly and effectively in both their learning process and future professional practice.

A critical factor in explaining how students adopt and benefit from technology in learning is their self-efficacy. Rooted in Bandura's social cognitive theory, self-efficacy refers to an individual's belief in their capability to organize and execute the courses of action required to achieve specific goals (Bandura, 1977). In educational contexts, self-efficacy has been consistently linked to learners' motivation, persistence, and performance (Apriani et al., 2024). Students with high self-efficacy are more likely to engage actively in learning tasks, employ effective strategies, and overcome challenges, whereas those with low self-efficacy may avoid difficult tasks, experience anxiety, or underutilize available resources. When applied to technology

use, self-efficacy influences how confidently learners approach new tools, the extent to which they explore their functions, and their resilience in addressing technical or conceptual difficulties.

In the context of AI-assisted language learning, self-efficacy takes on a particularly significant role. Unlike conventional educational technologies, AI tools often require users to engage in prompting, decision-making, and critical evaluation of generated outputs. For instance, when using ChatGPT to brainstorm essay ideas, students must be confident in formulating effective prompts, analyzing the relevance of generated responses, and integrating them appropriately into their academic work (Andewi et al., 2025). Similarly, when employing Grammarly, students need to assess whether the automated suggestions genuinely improve accuracy, coherence, and stylistic appropriateness, rather than adopting them uncritically (Miranty et al., 2025). This process demands not only technical competence but also a degree of critical literacy and self-regulation. Consequently, students' self-efficacy becomes a key determinant of whether AI tools enhance their learning or merely serve as a superficial shortcut.

Several studies have demonstrated that self-efficacy strongly predicts technology adoption and usage in educational contexts. For example, research on computer-assisted language learning indicates that students with higher self-efficacy are more likely to engage with digital platforms, experiment with multiple features, and achieve greater learning outcomes (Sherafati & Mahmoudi Largani, 2023). Recent investigations into AI tools have also suggested that learners' confidence in handling AI applications shapes their willingness to integrate these tools into their study routines (Zhu et al., 2025). Nevertheless, while the literature has highlighted the general potential of AI in education, there remains a paucity of empirical studies focusing specifically on English Education students in Indonesia (Zulianti et al., 2024). Existing research has predominantly examined AI integration from the perspectives of technological effectiveness, ethical implications, or pedagogical transformation (Trinovita et al., 2025). Few studies have addressed the psychological dimension, particularly how students perceive their abilities to leverage AI effectively for language learning.

The gap identified in the literature is important because students in English Education programs, as future English teachers, play a dual role as learners who benefit from AI tools and as prospective educators who may introduce these technologies into classrooms; thus, their self-efficacy shapes both their academic outcomes and professional attitudes toward AI in ELT. Without sufficient self-efficacy, students risk underutilizing or misusing AI in ways that undermine critical thinking, creativity, and ethical responsibility, yet there is little evidence from Indonesian contexts on how students perceive their confidence in AI use despite its growing presence in academic life. This study therefore aims to explore the self-

efficacy of English Education students in utilizing AI tools for language learning by assessing overall levels and identifying influencing factors such as prior digital experience, perceived usefulness, peer influence, ethical concerns, and institutional support, thereby moving beyond functional evaluation to reveal psychological underpinnings of effective technology use. The significance lies in its theoretical contribution to the intersection of AI adoption and self-efficacy theory, as well as its practical implications for curriculum developers, teacher educators, and policymakers in designing AI literacy training, scaffolded assignments, and reflective practices that encourage responsible use, while also informing the development of support systems that balance technological advantages with critical and ethical awareness; accordingly, the study is guided by the following research questions:

1. What is the level of English Education students' self-efficacy in utilizing AI tools for language learning?
2. What are the factors influencing English Education students' self-efficacy in utilizing AI tools for language learning?

METHOD

Research Design

This study employed a mixed-method design (Creswell & Creswell, 2018), specifically a sequential explanatory strategy, to investigate English Education students' self-efficacy in utilizing AI tools for language learning. The study began with a quantitative descriptive survey to measure the overall level of students' self-efficacy (RQ1) and was followed by a qualitative phase using thematic analysis to explore the underlying factors that shaped those self-efficacy perceptions (RQ2). The choice of this design was guided by the need to first capture a broad overview through numeric data and then to enrich the interpretation with in-depth qualitative insights. By combining quantitative and qualitative strands, the research sought to provide a holistic understanding of students' beliefs, confidence, and experiences in applying AI tools within the context of language learning.

Participants

The participants in the quantitative phase consisted of undergraduate students from an English Education program at a state university in Indonesia. These students were targeted because they are pre-service teachers who not only use English for their academic needs but are also being prepared to integrate technology, including AI, into future classrooms. A total of 100 students responded to the survey, which was considered sufficient for descriptive analysis. A purposive sampling technique was applied to ensure that participants had at least some prior exposure to AI tools such as ChatGPT, Grammarly, QuillBot, or AI-based translators.

Demographic data were collected in the first part of the questionnaire, including gender, semester level, frequency of AI use, and previous experience with AI.

For the qualitative phase, approximately fifteen students were selected as a sub-sample from among the survey respondents. The selection followed a maximum variation purposive strategy to ensure diversity in terms of gender, semester level, and self-efficacy scores (low, moderate, and high). This strategy was employed to capture multiple perspectives and experiences. Students who agreed to participate in follow-up interviews were contacted directly and provided with additional information about the second phase.

Instrument

The instrument used in the quantitative phase was a questionnaire adapted from the Teacher Artificial Intelligence (AI) Competence Self-efficacy (TAICS) scale developed by Chiu et al. (2025). This instrument was chosen for its relevance to application-based judgments of AI competence in education, making it particularly suitable for English Education students. The adapted version retained six constructs: AI Knowledge (AIK), AI Pedagogy (AIP), AI Assessment (AIA), AI Ethics (AIE), Human-Centred Education (HCE), and Professional Engagement (PEN). The questionnaire consisted of twenty items distributed across these constructs, rated on a five-point Likert scale ranging from one (not confident at all) to five (very confident). The first section of the instrument collected demographic data, while the second section measured students' self-efficacy. Expert validation was conducted to ensure contextual appropriateness, and Cronbach's alpha was used to assess internal consistency, with values above 0.70 regarded as acceptable.

In the qualitative phase, semi-structured interviews were used to gather data. An interview guide was developed with open-ended questions designed to elicit students' reflections on what made them confident or hesitant in using AI tools, the role of peers and lecturers, and the ethical considerations they encountered. The flexibility of semi-structured interviews allowed participants to provide detailed narratives while ensuring that the discussion remained aligned with the research focus.

Data Collection

Data collection was carried out in two distinct stages. In the quantitative phase, the questionnaire was administered online using Google Forms. The link to the survey was distributed through official student mailing lists and messaging groups. Students were first presented with an informed consent form and were asked to agree before proceeding to the questionnaire. The survey remained open for three weeks, during which reminders were issued to encourage responses.

The qualitative phase began after preliminary survey results were analyzed. Selected participants were invited to attend follow-up interviews, which were conducted either face-to-face on campus or online via Zoom or Google Meet, depending on participant preference. Each interview lasted between 45 and 60 minutes. Audio recordings were made with participant consent, and the recordings were transcribed verbatim for subsequent analysis.

Data Analysis

The survey data were analyzed using descriptive statistics. Mean scores and standard deviations were calculated for each construct and for the overall self-efficacy scale. The results were then classified into three categories: low (1.00–2.33), moderate (2.34–3.66), and high (3.67–5.00). This classification helped to interpret the level of self-efficacy among students in a meaningful way. These findings also informed the sampling of participants for the qualitative phase by identifying students across different ranges of self-efficacy.

The interview data were analyzed using thematic analysis following Braun and Clarke's six-step framework (Braun & Clarke, 2021). The process began with familiarization through repeated reading of the transcripts, followed by systematic coding of relevant excerpts. Codes were then organized into broader themes, which were reviewed and refined to ensure clarity and coherence. Themes were defined and named, and finally synthesized into a narrative account supported by representative quotations from participants. Anticipated themes included mastery experiences, vicarious experiences, social persuasion, and affective states, reflecting Bandura's conceptualization of self-efficacy sources.

Ethical Considerations

The study adhered to ethical principles of research involving human participants. Informed consent was obtained from all students prior to data collection, and participation was entirely voluntary. Respondents were assured that their responses would remain confidential and anonymous, with pseudonyms used in reporting. Students were also informed of their right to withdraw from the study at any stage without penalty. All data were securely stored and used solely for academic purposes. Ethical clearance for the study was obtained from the Faculty of Education Ethics Committee at UIN Raden Intan Lampung.

RESULTS AND DISCUSSION

Results

The level of English Education students' self-efficacy in utilizing AI tools

The first research question investigated the level of English Education students' self-efficacy in utilizing AI tools for language learning. Table 1 presents the descriptive statistics of students' responses across the six constructs of the adapted TAICS self-efficacy scale.

Table 1. Descriptive Statistics of Self-Efficacy Scores

Construct	Mean	SD	Min	Max	Level
AI Knowledge (AIK)	3.89	0.62	2.40	4.90	High
AI Pedagogy (AIP)	3.71	0.74	2.00	4.85	High
AI Assessment (AIA)	3.42	0.81	1.80	4.75	Moderate
AI Ethics (AIE)	3.12	0.77	1.50	4.50	Moderate
Human-Centred Education (HCE)	3.68	0.69	2.10	4.80	High
Professional Engagement (PEN)	3.36	0.82	1.70	4.70	Moderate
Overall Self-Efficacy	3.53	0.74	1.80	4.85	Moderate

As shown in Table 1, the overall self-efficacy score was 3.53, which falls into the moderate category. Among the six constructs, the highest mean score was recorded for AI Knowledge ($M = 3.89$), indicating that students felt relatively confident in understanding the functions and basic applications of AI tools. Similarly, AI Pedagogy and Human-Centred Education were rated at high levels, suggesting that students perceived AI as a useful aid for facilitating language learning while maintaining learner agency. On the other hand, the lowest mean scores were observed for AI Ethics ($M = 3.12$) and Professional Engagement ($M = 3.36$), both in the moderate range. These results suggest that students were less confident in applying AI responsibly or engaging in professional networks related to AI. Taken together, the findings indicate that while English Education students generally demonstrated moderate self-efficacy in utilizing AI tools, there were variations across constructs, with technical knowledge and pedagogical integration perceived as stronger areas compared to ethical and professional domains.

The factors influencing students' self-efficacy

The second research question examined the factors influencing students' self-efficacy in utilizing AI tools for language learning. Data from semi-structured interviews were analyzed thematically, resulting in five major themes as shown in Table 2.

Table 2. Themes and Sub-themes from Thematic Analysis

Theme	Sub-theme / Pattern	Example Quotation
Mastery Experiences	Repeated practice builds confidence	"After using ChatGPT many times, I feel I know how to ask better questions and get useful answers."
Vicarious Experiences	Learning from peers	"I saw my classmates use Grammarly effectively, and it motivated me to try it myself."
Social Persuasion	Encouragement from lecturers & peers	"When my lecturer suggested QuillBot for paraphrasing, I became more confident in trying it."
Ethical Awareness	Concerns about plagiarism & bias	"Sometimes I am not sure if using AI is fully ethical, and this makes me less confident."

The thematic analysis revealed that mastery experiences were the most frequently cited factor, with students highlighting that confidence grew as they gained more hands-on practice with AI tools. Vicarious experiences also played a role, as students reported observing and learning from peers' successful use of AI applications. Social persuasion emerged as another significant factor, where encouragement from lecturers and classmates increased students' confidence in experimenting with AI tools. At the same time, ethical awareness appeared as a constraint: students expressed hesitation due to uncertainty about plagiarism, academic honesty, and algorithmic bias. Finally, affective states influenced self-efficacy in diverse ways. While some students initially experienced anxiety about overdependence on AI, others reported that successful experiences increased their motivation and self-confidence.

Discussion

The findings of this study provide valuable insights into the self-efficacy of English Education students in utilizing AI tools for language learning. Quantitative results indicated that students generally possessed a moderate level of self-efficacy, with relatively higher confidence in technical knowledge, pedagogical integration, and maintaining learner-centred approaches. However, they reported lower levels of confidence in ethical use and professional engagement. Qualitative findings expanded on these results by identifying mastery experiences, vicarious experiences, social persuasion, ethical awareness, and affective states as key factors shaping students' self-efficacy.

These findings resonate with Bandura's theory of self-efficacy, which posits that mastery experiences, vicarious experiences, social persuasion, and affective states are the four primary sources of efficacy beliefs (Bandura, 1977). The present study provides empirical support for this theoretical framework in the context of AI-mediated language learning. For example, students' increasing confidence through repeated practice with ChatGPT reflects the importance of mastery experiences, while peer modeling and lecturer encouragement highlight the significance of vicarious experiences and social persuasion. At the same time, affective responses such as anxiety and motivation illustrate how emotional states can enhance or inhibit self-efficacy.

The results are also consistent with recent studies on AI in ELT. Similar to findings by Esiyok et al. (2025), this study revealed that students tended to be more confident in technical and pedagogical aspects of AI but less confident in ethical decision-making. Other research by Zhu et al. (2025) in Chinese EFL contexts similarly found that students embraced AI for writing support but expressed uncertainty regarding academic integrity. Moreover, the lower scores on professional engagement align with research by (Long et al., 2023), which

emphasized the need for structured institutional support and training to help pre-service teachers engage critically with AI.

In contrast, the current study highlights that Indonesian students demonstrated relatively strong confidence in human-centred education, suggesting an awareness of the importance of balancing technology with learner agency. This differs from studies in Western contexts, where concerns have often focused on AI's potential to diminish creativity (George & Wooden, 2023). One possible explanation is that Indonesian students, as pre-service teachers, are exposed to pedagogical discussions that emphasize learner-centred practices, which may explain their stronger confidence in this area.

Therefore, the findings underscore both opportunities and challenges. On one hand, the relatively high confidence in AI Knowledge and AI Pedagogy indicates that students are ready to integrate AI into their learning and future teaching practices. On the other hand, the moderate confidence in AI Ethics and Professional Engagement suggests that institutions must provide targeted interventions. Workshops, reflective activities, and explicit training on ethical AI use could address these gaps. Furthermore, fostering communities of practice and professional dialogue may enhance students' willingness to engage with AI critically and responsibly.

CONCLUSION

The findings of this study demonstrate that English Education students generally reported a moderate level of self-efficacy in utilizing AI tools for language learning. While students expressed high confidence in AI knowledge, pedagogical integration, and maintaining human-centred approaches, they indicated lower confidence in areas related to ethical use and professional engagement. This suggests that although students are increasingly familiar with the technical and pedagogical dimensions of AI, they remain cautious about issues of academic integrity, responsible use, and the professional implications of AI integration. The qualitative results provide further depth by revealing that students' self-efficacy was influenced by mastery experiences, vicarious experiences, social persuasion, ethical awareness, and affective states. These findings align with Bandura's sources of self-efficacy, underscoring that confidence in using AI is shaped not only by direct practice but also by peer modeling, social encouragement, and emotional responses.

Moreover, the study highlights both the potential and the challenges of integrating AI tools into English language education. On one hand, students appear ready to engage with AI for learning and future teaching, particularly in areas that support language practice and learner-centred approaches. On the other hand, gaps remain in ethical confidence and professional engagement, pointing to the need for structured institutional support, targeted training, and reflective practices that

emphasize critical and responsible use of AI. These insights carry significant implications for teacher education programs, which should ensure that pre-service teachers are not only technologically competent but also ethically aware and professionally engaged in AI-related practices.

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