

CHAPTER I

INTRODUCTION

1.1 Research Background

The significant increase in the use of artificial intelligence (AI) in educational settings has changed how students use learning resources. The increasing accessibility of AI has increased the relevance of technology use in education (Huertas-Abril & Palacios-Hidalgo, 2023). There is no doubt that technology plays an important role in fostering innovative learning approaches in the context of 21st-century education (Intan et al., 2022). AI has been able to process and analyze language error and has enabled students to access tutoring systems that deliver immediate detailed feedback, precise and customized explanations, thereby enhancing students' comprehension of grammatical structures, providing personalized, adaptive and engaging experiences that support English grammar acquisition. It has been shown that AI attracts considerable attention due to its potential to improve language learning methodologies and outcomes, especially in English grammar acquisition. (Hou, 2021; Qiao & Zhao, 2023; Song & Song, 2023). AI has also been able to deliver tailored vocabulary and grammar activities to improve students' reading and writing skills. Therefore, AI has been used in many classrooms to support students in developing grammar skills through its various capabilities (Huang et al., 2023; Suardewa et al., 2024). Despite the growing integration of AI in language learning, studies specifically examining AI use for English grammar

learning context remain unclear, particularly related to factors such as gender and self-efficacy.

Grammas was specifically chosen in this study because AI based applications are particularly effective to support grammar learning by providing instant feedback, personalized explanations, suggestions or automated correction compared to other English skills (Afriana et al., 2025). Grammar learning is more structured and suitable for AI-assisted practice (Singhal & Tyagi, 2025). In addition, grammar is often perceived as one of the most challenging aspects of foundation for other English language skills, leading students to seek technological assistance to improve their understanding (Daskan, 2023). Grammar learning also requires independent practice which lead self-efficacy as an important factor to influence students' willingness to utilize AI applications (Chen et al., 2024). Furthermore, as prospective English teachers, mastery of grammar is essential because teachers are expected to demonstrate accurate language use and strong grammatical competence in both academic and professional settings (Jumanazarov, 2021). This grammar oriented focus provides a more specific perspective for examining AI use, since grammar learning provide accuracy, precision and continuous feedback, areas in which AI based applications play a particularly significant role compared to other English language skills.

Furthermore, the statistical impact of AI on English grammar learning has varied depending on student demographics. This exploration has become even more critical when considering the correlation of different demographic factors, particularly the role of gender in the use of technology for educational context,

within the context of English education (Nair et al., 2003; Pazilah et al., 2019). Several factors may explain the gender differences in the use of educational technology. One crucial element is the learning environment, where female students may perceive receiving lower levels of support and exhibit lower expectancy value beliefs compared to the male students. This condition may have affected how actively female students engage with AI tools compared to male students. Therefore, social stereotypes and gendered perceptions of technology have shaped student's attitudes and self-efficacy, towards different adoption patterns (Latorre Ruiz & Pérez Sedeño, 2023; F. Wang et al., 2023). Although previous studies have explored gender differences in educational technology adoption, limited attention has been given to how these differences appear specifically in AI use for English grammar learning contexts.

Recognizing the relationship of gender on AI use helps to clarify why self-efficacy varies between individuals. In the context of education, self-efficacy refers to a student's belief in their capacity to successfully perform specific tasks or achieve particular goals related to their learning (C. Zhang, Schießl, Plöbl, Hofmann, & Gläser-Zikuda, 2023). Academic self-efficacy is one of the importance factors that significantly impacts academic performance (Hayat et al., 2020). The ability of AI to transform ways of learning has depended on students' willingness to actively use AI tools, self-efficacy has played a crucial role in student's engagement of using AI for learning (Mah & Groß, 2024). Theory, developed by (Bandura, 1977) emphasizes the importance of students' beliefs in their own abilities. When students feel confident about their skills, they are more likely to engage with AI applications effectively. This has shown

that the need to reinforce students' self-efficacy, as it significantly enhances their educational experiences and outcomes. Therefore, investigating self-efficacy in relation to AI use in grammar learning may provide deeper insights into students' confidence and willingness to engage with AI application as educational purpose.

Previous research has revealed that gender and self-efficacy can play a role in technology acceptance, yet findings have remained inconsistent while (Al-Samarraie et al., 2024; Nggawu, 2024; Venkatesh et al., 2003; Zhang et al., 2023) have indicated that males were more likely to show higher levels of confidence and more positive attitudes towards technology, including AI, compared to female. Study by Estrada-Araoz et al., (2025) found that males demonstrated higher self-efficacy than females, but no significant gender differences were found in AI dependence. These inconsistent findings indicate the need for further investigation into whether gender and self-efficacy demonstrate similar patterns in more specific learning contexts, such as English grammar courses.

Recent research has explored how gender and self-efficacy affect the use of AI in English grammar learning among university EFL students. However, many studies have lacked a broader exploration of AI applications in language learning contexts. Some findings have also shown contradictions for instance one study showed that there's no significant different were found in AI use across gender but the study found that males demonstrated higher self-efficacy than female peers. The novelty of this study lies in its comprehensive focus on

the combined relationship of gender and self-efficacy on students' use of AI for grammar proficiency.

This study aimed to understand how gender differences and self-efficacy interacted in shaping student's motivation, perceptions of AI, and English learning outcomes. It also addressed ongoing gender gaps in perceived AI knowledge and ability, with female students often reporting lower confidence and support for AI use. By focusing on the relationship between these factors, the study aimed to fill the gap in understanding of how self-efficacy mediated the link between gender and AI use for grammar learning.

1.2 Research Problem

The latest advancements in artificial intelligence (AI) have transformed language learning especially in the field of English grammar, by providing accessible adaptive and valuable tools, such as grammar checkers, writing assistants, and Chatbot (Agustina & Damanik, 2024). Previous studies have demonstrated the effectiveness of AI tools in improving grammar proficiency and supporting learners' self-efficacy (Kittredge et al., 2025; Mudhsh et al., 2025; Zhang et al., 2025). However, there has remained a significant need to examine how gender and self-efficacy influencing individuals' interactions with AI-based application for English grammar learning, especially within higher education contexts.

Existing research has indicated that both male and female students generally perceive AI tools as valuable tools, with no significant gender differences in perceived effectiveness of AI use (Iddrisu et al., 2025). However, questions have remained about whether gender moderates the relationship between self-

efficacy and students' use of AI-based applications, or if it independently predicts AI usage patterns. Furthermore, it has been unclear whether certain gender groups are more likely to use and integrate AI tools into their academic routines, or if external factors such as technological experience and peer influence affect self-efficacy in AI use. Self-efficacy is defined as an individual's confidence in their ability to perform specific tasks and has been identified as a crucial factor influencing both the adoption of technology and learning success in settings that incorporate AI tools. The role of self-efficacy in the relationship between AI use for grammar learning and students use of AI-applications patterns across genders has required deeper exploration particularly given existing research that highlights self-efficacy as a key psychological factor influencing language learning (Kittredge et al., 2025; Zhang et al., 2025).

This study use Multiple Linear Regression (MLR) to offers a detailed perspective on how demographic and psychological factors interact and relate to both technology use and educational outcomes. While prior research has shown that MLR is effective in forecasting students use of AI based on factors like digital competence and resource availability, its application in the specific context of English grammar learning in higher education has remained limited (Flores Hinostroza et al., 2025).

1.3 Research Limitation

This research focused specifically on university students who use AI-based tools such as Grammarly, QuillBot, and ChatGPT for completing English grammar

tasks. The findings were not intended to represent students at other educational levels, such as high school, nor individuals in professional or workplace settings.

In terms of scope, the study emphasized two key influencing factors: gender and self-efficacy. Other possible variables like students' motivation, prior exposure to technology, or digital fluency were outside the scope of this analysis. The study employed a quantitative method questionnaire-based data collection that was analyzed through multiple linear regression which limited the exploration of learners' deeper perspectives or experiences that could have been uncovered through interviews or observation.

Additionally, the study was limited to grammar-supporting AI tools. It did not examine how students use of AI for other language skills such as speaking or reading, nor did it address concerns related to academic integrity, such as plagiarism. Furthermore, this research did not investigate the possibility of students becoming overly dependent on AI applications or developing habitual overuse issues, which may be considered important topics for future research.

1.4 Research Questions

The research questions of this study are:

- (1) Is there a significant relationship between gender and students' use of AI-based applications in English Grammar Courses?
- (2) Is there a significant relationship between self-efficacy and students' use of AI applications in English Grammar Courses?

- (3) Is there a significant combined relationship of gender and self-efficacy with students' use of AI applications in English Grammar courses?

1.5 Research Objectives

In line with the research questions, the objectives of this study are as follows:

- (1) To examine the relationship between gender and students' use of AI based applications in English grammar course.
- (2) To examine the relationship between self-efficacy and students' use of AI based applications in English grammar course.
- (3) To examine the combined relationship of gender and self-efficacy with students' use of AI applications in English grammar course.

1.6 Significance of Research

Theoretically, this study contributed to the understanding of how gender and self-efficacy are related to students' AI use for learning English grammar in university settings. While AI in language learning has been widely discussed, grammar-focused tools such as Grammarly, Quillbot and Chat-GPT have remained under-researched. By examining how social factors such as gender and personal confidence interacted, this study helped explain why students use AI differently and filled gaps in previous research that reported mixed results.

Practically, the findings can help teachers, students, universities, and app developers create better learning experiences. For teachers, the results provide insights to design more inclusive teaching strategies and give targeted support to students with lower self-efficacy. For students, the study encourages them to

view AI tools not as shortcuts but as learning companions to build confidence and improve grammar accuracy. For universities, the findings can inform curriculum development and the creation of digital literacy programs or training workshops that prepare students to use AI effectively. For app developers, this research offers feedback to design grammar-supporting tools that are more user-friendly and inclusive, with adaptive feedback and supportive features that accommodate learners with varying confidence levels. Understanding how gender and self-confidence relationship with AI use contributed to the development of more supportive teaching methods, helpful training programs, and easier-to-use grammar tools. This way, students regardless of their background or confidence level can get the most out of AI to improve their English skills.

