

# CHAPTER I INTRODUCTION

## 1.1 Background

The use of artificial intelligence (AI)-based language learning programs has significantly increased globally, according to advances. More than 500 million people use language-learning apps like Duolingo, Kahoot, Quizlet, and Memrise globally, according to edtech industry reports. These apps have AI algorithms that can modify difficulty levels, offer immediate feedback, and repeat vocabulary based on user behaviour (Mohammed & Jesudas, 2025). This phenomenon represents a paradigm change in language learning, moving away from teacher-centered instruction and toward learner-centred, technology-enhanced instruction. This tendency is consistent with Indonesia's Merdeka Belajar strategy and school digital transformation, which promote the use of technology in formal education (Elida et al., 2025).

However, learning English as a foreign language (EFL) still faces serious challenges, especially in productive skills such as writing (Gamal & Daud, 2025; Yu, 2025). Various studies have shown that limited productive vocabulary is a major factor in the low quality of students' writing, both in terms of idea coherence, lexical accuracy, and grammatical complexity (Sumanding et al., 2024). Writing in a foreign language is not simply a mechanical activity, but a complex cognitive process involving the processing of written and spoken language, as well as the systematic organization of ideas. Therefore, learning innovations that can strengthen understanding in a contextual and constructive manner are urgently needed in the EFL context (Seddik, 2025).

The challenges with EFL learning are not only linguistic in origin, but also related to student motivation and involvement. Conventional methods, such as word memorisation and tedious writing assignments, frequently result in a less enjoyable learning experience (Laksanasut, 2025). This predicament emphasises the need for more engaging tactics tailored to the features of the digital generation. Gamification is one such approach that has evolved into an educational tactic for increasing student engagement, involvement, and language retention. Gamification

provides a more personalised and effective learning experience by adding aspects like points, levels, challenges, and rapid feedback, particularly when combined with AI systems that adapt to individual learners' needs (Salmanova, 2025). Despite being a popular tool for learning grammar and vocabulary, Duolingo's integrated writing practice is still quite limited. In reality, Duolingo is more commonly used on its own or as extra practice, without a direct educational link to the objectives of writing instruction in the classroom (Asmar et al., 2025).

The main gap that emerged was the disconnect between digital vocabulary development and classroom writing practice. A number of international studies show that using Duolingo can improve EFL students' vocabulary mastery and motivation to learn (Wei-Xun & Jia-Ying, 2024). However, most of these studies are quantitative and focus on end results, without exploring students' learning experiences or the process of integrating technology into writing instruction (Ali et al., 2024). Gamification-based research also shows increases in engagement and lexical accuracy, but it still positions technology as an additional tool rather than an integral part of writing instruction design (Laksanasut, 2025).

Furthermore, quantitative trials have been the predominant methodological approach in earlier research, which makes them less suited to capturing the dynamics of the learning process and the pedagogical difficulties teachers encounter when incorporating AI into writing instruction. There is currently very little mixed methods research in this area that combines quantitative and qualitative data. Consequently, there is still a lack of a comprehensive understanding regarding the efficacy and educational implications of AI-based vocabulary games (Phanwiriyarat et al., 2025).

Based on this observation, research is needed that not only quantifies the increase in writing skills data statistically, but also investigates how students experience and improve their learning process through AI-based games. In addition to providing a more comprehensive and humanistic analysis, mixed methods research can also yield a contextualised pedagogical model for integrating Duolingo into EFL classroom instruction.

## **1.2 Problem Identification**

Globally speaking, writing skills in the context of EFL are one of the most difficult skills to be discussed by students, primarily due to a lack of active vocabulary (Ali et al., 2024; Gamal & Daud, 2025). In Indonesia, teaching English is still dominated by traditional methods such as translation and memorization, resulting in a lack of understanding of the languages being taught and the ability to use them in writing (Yuniarsih, 2022). Even though students need about 2.000–3.000 basis vocabulary words to write a simple text effectively, the majority of those words are only discussed in a respectful manner (Wei-Xun & Jia-Ying, 2024).

Although Duolingo is a great tool for expanding vocabulary and boosting learning motivation, its use in formal education remains somewhat limited (Rouabhia & Kheder, 2024). Students find it difficult to apply the ideas they learn from AI games to written language and graphics because these are often unrelated to writing tasks (Gamal & Daud, 2025). The learning environment may become less relevant, less mechanical, and unable to increase students' self-confidence if this situation is not treated.

Prior research also highlights the difficulties in systematically integrating quantitative and qualitative data. Without using mixed methods, the study only shows results at the end of the learning process, not the process of skill development. Because of this, research that examines EFL pedagogy theory, technology, and practice in greater detail is required.

### **1.3 Research Problem**

1. Does the integration of AI-driven vocabulary games from Duolingo have a significant impact on the improvement of EFL students' writing quality, particularly in terms of vocabulary and sentence structure?
2. How do EFL students perceive the use of AI-driven vocabulary games from Duolingo in supporting their writing activities?

### **1.4 Research Objective**

1. To determine how much using Duolingo's AI-powered vocabulary games improves EFL students' writing, particularly in vocabulary use and sentence structure.
2. To investigate EFL students' perceptions of using AI-driven vocabulary games from Duolingo to support their writing activities.

### **1.5 Research Benefits**

#### **A. For Teachers and Education Practitioners**

Providing a structured AI Duolingo game-based vocabulary learning model that can be directly integrated into basic writing lessons. Helping teachers design writing activities that are more adaptive, contextual, and student-centred.

#### **B. For EFL Students**

Improving students' basic writing skills by strengthening their productive vocabulary used in context. Fostering students' motivation, confidence, and engagement in the writing process through interactive and humanistic learning approaches (Yang & Ying, 2026).

#### **C. For Future Researchers**

Serving as a conceptual and methodological reference for further research on AI, gamification, and EFL writing skills. Opening up opportunities for replication research or the development of similar learning models in different educational contexts and levels.