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Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros

**The Use of Chatbots to Enhance Productive Skills in the EFL/ESL Classroom**


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### Resumen

La integración de *chatbots* con inteligencia artificial (IA) en la educación del idioma inglés se ha convertido en una forma innovadora de mejorar las experiencias de enseñanza y aprendizaje en las clases de inglés. Esta síntesis de investigación examina quince estudios para analizar los efectos y percepciones del uso de chatbots para desarrollar habilidades lingüísticas en las aulas de inglés como Lengua Extranjera (EFL) y de inglés como Segunda Lengua (ESL). Los estudios seleccionados utilizan metodologías cualitativas, cuantitativas y mixtas, con un enfoque en el método mixto para capturar las experiencias y opiniones de profesores y estudiantes. Estos estudios se llevaron a cabo en contextos de EFL/ESL y fueron publicados en revistas revisadas por pares en la última década, asegurando una recopilación de datos confiable. Los hallazgos muestran que los chatbots pueden mejorar significativamente las habilidades de escritura y expresión oral; así como, aumentar la participación, motivación, confianza y autonomía de los estudiantes. Sin embargo, se identificaron algunas limitaciones como la excesiva dependencia de los estudiantes en los chatbots y la falta de interacción entre profesores y estudiantes y entre pares. El estudio sugiere que la implementación y el rendimiento de los chatbots necesitan una supervisión cuidadosa para prevenir impactos negativos en las experiencias educativas.

*Palabras clave del autor:* competencia comunicativa, competencia en escritura, enseñanza del inglés, innovación educativa



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### Abstract

The integration of AI chatbots in English language education has become an innovative way to improve teaching and learning experiences in English classes. This research synthesis examines fifteen studies to analyze the effects and perceptions of using chatbots to develop language skills in English as a Foreign Language (EFL) and English as a Second Language (ESL) classrooms. The selected studies use qualitative, quantitative, and mixed methodologies, focusing on the mixed-method approach to capture teachers' and students' experiences and opinions. These studies were conducted in EFL/ESL contexts and were published in peer-reviewed journals in the last decade, ensuring reliable data collection. The findings show that chatbots can significantly improve writing and speaking skills, as well as increase student engagement, motivation, confidence, and autonomy. Notwithstanding, some limitations were identified, such as students' overreliance on chatbots and a lack of teacher-student and peer interaction. The study suggests that the implementation and performance of chatbots need careful monitoring to prevent negative impacts on educational experiences.

*Author Keywords:* communicative competence, writing proficiency, English teaching, innovative education



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### Dedication

First and foremost, I dedicate this work to God, who has been my pillar of strength during my toughest times.

This research synthesis is a tribute to my beloved parents, Gloria and Jorge, who have consistently provided me with support and comfort during challenging moments, and whose influence has inspired me to seek personal growth. To my aunts, Lucía and Rosa, and my uncle, Pablo, whose actions have motivated me to be a better person and have served as a model of professionalism. Furthermore, to my wonderful grandmother, Elvira, for her love, encouragement, and help, which have motivated me to persevere. To my whole family, who have consistently supported and motivated me to strive for success.

Finally, I will always remember this work and dedicate it to myself, as evidence that I can work hard and accomplish all my goals at my own pace.

Sincerely,

Paul Juca



## Introduction

The advent of technology and Artificial Intelligence (AI) in education has led to a significant shift in teaching and learning methodologies. This has the potential to personalize learning, provide immediate feedback, and facilitate access to current information. According to UNESCO IESALC (2023), AI-based tools can personalize the learning experience for students by adjusting their learning pace, recommending learning resources, providing feedback, and offering teachers the students' progress updates. Moreover, intelligent tutoring systems, chatbots, and virtual and augmented reality are some of the many personalized learning applications that can help in education.

Currently, the integration of AI chatbots into English language instruction has emerged as a transformative educational tool for language acquisition. Research has shown that conversational agents significantly improve learners' speaking and writing skills. Certainly, Chatbots support language learners by assisting with speaking practice, recognizing writing problems, directing peer evaluations and research, allowing learners to assess their own progress, and granting teachers' access to student-bot interactions and progress monitoring (Fryer & Carpenter, 2006). Therefore, this research synthesis of fifteen primary studies has been conducted to consolidate and analyze data on the impact of AI chatbots on EFL and ESL learners' communication skill development.

As English language learners need to attain proficiency in the target language, researchers have focused on the potential of AI chatbots to boost learners' abilities, especially in writing and speaking. Moreover, developing nations, such as Ecuador, encounter challenges related to the lack of training, knowledge, and technological development in the context of emerging digital devices like chatbots. Nevertheless, integrating chatbots into EFL and ESL classrooms can enhance learners' productive skills in Latin American countries. Consequently, this study aims to address the following research questions: What are the effects of the use of AI chatbots on the development of writing skills, as reported by the pertinent literature? What are the effects of the use of AI chatbots on the development of speaking skills, as reported by the pertinent literature? What are the students and teachers' perceptions of the implementation of AI chatbots in the classroom?

The research synthesis is organized into six chapters. The first chapter introduces the research background, problem statement, rationale, research questions, and objectives. The second chapter discusses the theoretical foundations of EFL/ESL education, linguistic competence, and the use of Information and Communication Technologies (ICTs) and AI in pedagogical practices. The third chapter synthesizes the literature review, providing a comprehensive understanding of the accumulated knowledge from the primary research

studies. The fourth chapter provides details of the methodology undertaken, including the selection criteria, data collection process, and the analytical approach taken. The fifth chapter presents the findings of the research synthesis, including a discussion of the benefits, constraints, and implications of chatbot use for EFL/ESL students and teachers. Finally, the sixth chapter outlines the conclusions and recommendations, providing a comprehensive overview of the research synthesis.

## Chapter I

### Description of the Research

#### 1.1 Background

In the last decades, the implementation of ICTs has evolved in education, which has provoked the development of digital technologies as a new system in the language teaching and learning context.

According to Vuorikari et al. (2020), the emergence of new underlying technologies, such as AI, Mixed Reality (MR), Augmented Reality (AR), portable technology, social robotics, and the Internet of Things (IoT), has brought modern solutions and new digital environments to the educational field. Indeed, the use of technology in education has supported teachers and learners with diverse tools used to enhance the learning domain. For instance, one of the most relevant technologies to improve language learning and teaching is known as AI. Conforming to Lakshmi and Majid (2022), AI “is being looked up as a potential ICT option to transform how education would operate” (p.15).

In the same line, Haenlein and Kaplan (2019) stated that the term AI was officially used in 1956 by Marvin Minsky and John McCarthy when they organized a research project on artificial intelligence at Dartmouth College in New Hampshire. This workshop began with a new era of AI technology; therefore, addressing the term AI and its definition is important. As reported by Healey (2020), “Artificial intelligence is a broad term used to describe a collection of technologies that can solve problems and perform tasks to achieve defined objectives without explicit human guidance” (p.3). Based on this definition, AI can optimize teaching and learning processes by providing solutions and performing tasks for both educators and learners. Currently, the application of AI in education has increased and has become more natural among humankind. An example of a commonly used AI program is the virtual assistant *Siri*, developed by Apple. This program, like other smart assistants, such as *Cortana*, *Alexa*, and *Google Assistant* can support language learning and teaching due to its conversational system with humans. As Ali (2020) mentioned, operating systems to communicate in English are useful as they support learners to improve their productive skills, mostly pronunciation. In fact, the system that AI uses is particularly relevant for English as a Second Language (ESL) and English as a Foreign Language (EFL) learners since this type of communication between individuals and AI is related to the Computer Assisted Language Learning (CALL) approach. In this sense, Shawar (2017) agreed that “CALL systems are built to facilitate teaching and learning a foreign language by using computers” (p. 615). Likewise, a very similar approach is Computer-Mediated Communication (CMC), which arises through digital tools. Some CMC categories include instant messaging, email, chat rooms, online forums, social networks, and

chatbots. The last one has become relevant in certain fields of education as a conversational tool, which facilitates the learning and teaching process of a target language.

In point of fact, Haristiani (2019) revealed that a “Chatbot is a computer program or artificial intelligence which carries out conversations through audio or text and interacts with users in a particular domain or topic by giving intelligent responses in natural language” (p. 1). Moreover, chatbots, also called Conversational Agents or Artificial Conversation Entities, are considered an alternative for educators to grab learners’ attention and increase their motivation. As Johnson (2001) acknowledged, it has been found that the interaction with chatbots captures students’ attention since they have autonomy to explore learning materials and perform activities that support their academic performance. In consequence, the development and application of conversational agents in this field have been fostered.

In line with this, Fryer and Carpenter (2006) admitted that various scholars have considered chatbots as a valuable tool in EFL due to the limited opportunities for pupils to practice the target language in the classroom. Furthermore, according to these authors, chatbots have taken an important role in English language and teaching practice, especially when dealing with productive skills, which academically are defined as “the transmission of information that a language user produces in either spoken or written form” (Golkova & Hubackova, 2014, p. 478). Based on this, previous research has revealed that chatbots are beneficial for advanced learners; however, they are not very effective for novices, as this tool responds to its original design, which is facilitating interaction among native speakers (Fryer & Carpenter, 2006). Contrarily, Kim (2016) indicated that as well as advanced learners, intermediate and beginner students could improve their level of language proficiency by using an AI chatbot as a communicative tool. Indeed, for these authors, English speaking and writing skills are crucial to the goal of mastering the language; therefore, the incorporation of digital tools such as chatbots may facilitate the acquisition of these skills regardless students’ level or domain.

Lastly, several researchers have found that the use of AI chatbots has become a remarkable contribution to improving students’ communicative competence. Certainly, the different means to liaise with artificial conversation entities (i.e., audio and text) are strongly related to the improvement of productive skills in language learning; therefore, the application of chatbots as a teaching and learning tool is a current issue, which needs to be explored in underdeveloped countries.

## 1.2 Problem Statement

English language teaching has developed diverse techniques and new methods for knowledge acquisition. In recent years, the relevance of incorporating ICTs in the teaching and learning of English has increased due to the advancement of technology, particularly in

terms of productive skills. Alvarado (2014) explained that productive skills (writing and speaking) are extremely difficult to enhance, as they require fluent and appropriate output production. Besides, the author revealed that students' lack of confidence provokes difficulties and limitations when they develop a written or spoken task because of their shyness, lack of lexicon, or fear of being humiliated. Thus, the implementation of chatbots to enhance students' productive skills turns effective in English classrooms as they allow students to elaborate repetitive tasks. Frequently, assignments in English require written or spoken tasks, which may become tedious for some students. The use of chatbots might solve this.

Additionally, Kim et al. (2021a) asserted that students may feel more confident, relaxed, and less anxious when talking to a machine rather than a human being as these programs have the potential to perform various tasks, such as correcting mistakes, giving alternatives, or generating questions, without judging students for mistakes made. This situation facilitates the language learning experience and increases the opportunities for pupils to practice productive activities. Along with the above, a major factor for the success of language proficiency is related to students' motivation since when experiencing pressure or stress, they may not be able to generate ideas. However, with the support of chatbots, students might be able to perform better on some tasks that were previously reviewed by their teachers.

In developed countries such as South Korea, in a study conducted by Kim et al. (2021a), it is demonstrated that there are positive effects on the use of chatbots on EFL learners since the participants of the study, with different levels of English, evidenced they have enhanced their pronunciation, intonation, and stress by using conversational intelligent assistants. Likewise, Han (2020) revealed in her study that "AI chatbots also provide chances for the learners to practice diverse vocabulary and sentence composition [which] they would not have the opportunity to use in their real situations" (p.73).

Nonetheless, in the case of Ecuador, an underdeveloped country, the possibility of successfully incorporating chatbots seems unlikely due to certain factors such as the teachers and students' knowledge about technology and the investment in resources for education.

Indeed, Solano et al. (2017) affirmed in their study that educators do not have the means to incorporate technological tools in the EFL classroom. Further, in the same study they mentioned that the incorporation of ICT seems to be a common problem in Ecuadorian public schools, considering the lack of funds for the innovation of digital technologies.

Moreover, in Ecuador, the English level is very low in comparison to other Latin American countries. The International Education Organization Education First (2022) has reported in a recent study that English proficiency in Ecuador is located at a low level, precisely in the number 82 out of 111. Consequently, because of the limitations of the educational system, the country has reduced its possibility to implement new and useful digital technologies like

chatbots, which could potentially enhance students' writing and speaking skills. In sum, the examples cited above highlight the problem of the lack of training, knowledge, and technological development related to emerging digital devices.

Thus, one way to overcome this problem is to incorporate chatbots into EFL and ESL classrooms in order to foster learners' productive skills in developing nations.

### 1.3 Rationale

The development of the English language competencies for EFL/ESL learners is a determining factor in their academic performance. In the same way, teachers are willing to enhance their strategies to advance and change the way they teach a language by using new technologies. Yet, in the case of most educational institutions in Latin America, there is neither use of technological equipment nor sufficient knowledge or financial resources to acquire new tools. Considering the decision of educators and learners who want to change for a better education, the correct implementation of emerging digital devices is a solution to this problem. Indeed, this research intends to find out, based on the pertinent literature, if the use of new computer systems, such as Artificial Intelligence, opens up many more possibilities for the development of students and teachers in the academic and labor context. Can et al. (2019) anticipated that in the coming years, AI technologies could have a significant impact on teaching and learning processes. Furthermore, they emphasized that "it is mostly up to educators to use AI technologies to successfully support and enrich their teaching" (p. 97).

Therefore, it is of special interest to investigate the potentiality of intelligent conversational systems, such as AI chatbots for English language teaching and learning advancement. Fryer and Carpenter (2006) reported that chatbots could contribute to better opportunities for EFL learners to improve their English proficiency. They also established many aspects that guarantee the contribution of these conversational digital tools as follows:

Chatbots provide an anxiety-free environment, repeat the same content for learners endlessly without losing patience, improve learners' motivation and enhance their interest in language learning, provide opportunities for learners to practice the target language, and they afford instant and effective error correction. (Fryer and Carpenter, 2006, p. 391).

In this line, to examine the impact of chatbots in language learning and teaching, it is recommended to research the main benefits they offer to both learners and teachers. In fact, numerous studies have proven that AI chatbots assist learners in productive skills enhancement; for example, the participants of a study carried out by Haristiani (2019) showed the need of using chatbots as conversation partners due to their accessibility and modernity. This study also evidenced that students can interact with a virtual partner anywhere and

anytime, thanks to the various free and paid online programs for artificial conversation agents. Notwithstanding, although chatbots can help to develop communication abilities, there is a low adoption of these new digital tools in the Ecuadorian context.

Consequently, based on the information stated, the purpose of this study is to analyze the possibility of using chatbots to enhance productive skills in the language learning and teaching process within EFL and ESL classrooms.

#### **1.4 Research Questions**

- What are the effects of the use of chatbots on the development of the writing skill in an EFL/ESL context, as reported by the pertinent literature?
- What are the effects of the use of chatbots on the development of the speaking skill in an EFL/ESL context, as reported by the pertinent literature?
- What are the students and teachers' perceptions of the implementation of chatbots to enhance productive skills in an EFL/ESL classroom?
- 

#### **1.5 Objectives**

##### **1.5.1 General objective**

- To identify and analyze the effects and implications of the use of chatbots for the development of productive skills in an EFL/ESL classroom as reported in the pertinent literature.
- 

##### **1.5.2 Specific Objectives**

- To identify and analyze the benefits and limitations of chatbots on the development of the writing skill in EFL/ESL learners.
- To identify and analyze the benefits and limitations of chatbots on the development of the speaking skill in EFL/ESL learners.
- To analyze the perceptions students and teachers have on the implementation of chatbots in an EFL/ESL classroom.

## Chapter II

### Theoretical Framework

#### 2.1 Introduction

This chapter encompasses the systematic revision of concepts, fundamentals, and definitions required for a thorough understanding of the contents of primary studies associated with the integration of chatbots to enhance productive skills in the EFL/ESL classroom. The chapter is divided into three main sections: the fundamentals of the EFL and ESL classroom, linguistic competence focusing on speaking and writing skills, and implementing ICTs and AI in the EFL and ESL educational context.

#### 2.2 The Fundamentals of the EFL/ESL Classroom

This research synthesis focuses on EFL/ESL environments; therefore, it is pertinent to establish precise definitions for both terms. According to the Cambridge Dictionary (n.d.-a), EFL refers to the pedagogical approach of instructing and acquiring the English language within a non-English speaking nation. Conversely, ESL pertains to the educational practice of teaching and learning English among individuals with a first language other than English (Cambridge Dictionary, n.d.-b). Indeed, Harmer (2015) distinguishes EFL as acquiring English for global communication in non-English speaking countries and ESL as gaining English proficiency for social and cultural integration in English-speaking environments.

Given these definitions, it is appropriate to establish the principles for teaching English to non-native speakers. These educational settings prioritize language and cultural development through authentic tasks and supportive environments for students (Jeong, 2016). Their key objective is to facilitate effective communication and enhance language learning in students. Furthermore, educators employ various pedagogical approaches, such as Sociocultural theory, to nurture linguistic and cultural diversity within the classroom.

Sociocultural Theory, originated by Vygotsky, underscores the importance of cultural and social context in the development of cognition and knowledge acquisition and suggests that learning is a collaborative process that occurs through interactions with others and the environment (Vygotsky, 1978). Moreover, EFL/ESL courses provide priority to the integration of language skills, including speaking, listening, reading, and writing, to optimize the acquisition of language proficiency. Under these characteristics, EFL and ESL classrooms strive to create an engaging educational environment by fostering language proficiency and intercultural competence.



### 2.3 Linguistic Competence Focusing on Speaking and Writing Skills

Language proficiency is crucial for effective communication in EFL and ESL classrooms. Consequently, English language learners must prioritize the development of their language competencies in oral and written communication skills. By definition, productive skills are "the transmission of information that a language user produces in either spoken or written form" (Golokova & Hubackova, 2014, p. 478). On a different note, "Receptive skills are listening and reading because learners do not need to produce language to do these; they receive and understand it" (British Council, n.d., para. 1).

Considering the widespread use of English as a global language, numerous courses prioritize the development of productive skills, including speaking and writing. Therefore, it is essential to incorporate appropriate teaching methods to enrich these skills.

Defining speaking and writing skills is crucial as they form the foundation of this study. As pointed out by Denman and Al-Mahrooqi (2019), speaking skills encompass the ability to effectively communicate information and concepts through verbal means. This includes demonstrating correct language proficiency, intonation, and pronunciation, as well as displaying nonverbal behaviors like facial expressions and gestures.

Hyland (2021) states that in the context of English language education, writing skills pertain to the proficiency of language learners in producing written texts, which is achieved through consideration of various aspects, such as grammar, vocabulary, coherence, and cultural factors. It requires developing diverse subskills like idea generation, information organization, constructing coherent paragraphs, using suitable vocabulary and syntax, and performing effective revision and editing of one's writing. Integrating contemporary approaches in English language instruction provides diverse solutions to students' academic writing challenges.

### 2.4 Implementing ICTs and AI in the EFL/ESL Classroom

The importance of ICT in EFL/ESL education is increasingly prevalent. Therefore, it is vital to understand that its implementation addresses issues related to technology use, Internet access, and teacher training to guarantee its consistent use. According to Akhy and Iswari's (2021) findings, ICT enables language learners to communicate and develop skills through diverse approaches, including user interaction and CMC. Integrating ICT in English language classrooms has the potential to boost learner autonomy, provide access to authentic resources, and enhance language proficiency. In essence, the authors highlight the need for comprehensive teacher training in ICT to ensure effective technology integration in language teaching and learning (Akhy & Iswari, 2021).

Additionally, Misirli (2016) asserts that "technology integration models have an important role in terms of integration of ICT to learning and teaching process, the embodiment of technology

integration which is a complicated process” (p. 46). Thus, technology adoption enhances teaching and learning by using ICT, boosting engagement, personalizing learning, and fostering collaboration. Moreover, the implementation of AI in EFL/ESL classrooms is a subject of increasing significance in education. Since the emergence of new technologies following the COVID-19 pandemic, the implementation of digital tools, notably AI, has increased in recent years (Nurhasan et al., 2022). In a review of international publications, Siswa (2020) observed that during the pandemic, the use of AI to analyze data patterns and automate tasks effectively enhanced student focus on education, while also assisting teachers in evaluating learning outcomes. Besides, Sumakul et al. (2022) report that AI apps can provide personalized feedback on students' writing, speaking, and vocabulary, but AI should be viewed as a tool rather than a teacher replacement.

#### **2.4.1 Artificial Intelligence in Education**

Based on recent studies, it is anticipated that AI will soon be integrated into the global education system (Kushmar et al., 2022). Scholars are working to advance education through technology, streamline administrative tasks, and support educators and learners. For instance, Zovko and Gudlin (2019) conducted a study outlining the key applications of AI in education, including smart content creation, learner profiling and prediction, intelligent educational robots, intelligent tutoring systems, and evaluation activities. Notwithstanding, according to the same authors, despite the resistance of the current education system to AI's influence, there is significant potential for it to revolutionize the methods of knowledge transmission and assessment (Zovko & Gudlin, 2019). To highlight the significance of AI in education, it is relevant to examine additional domains that offer opportunities for effective AI integration. Along the same lines, Frasson and Gauthier (1990) argue that AI applications in education should encompass domains, such as knowledge representation, communication, problem-solving methodologies, dynamic student modeling, human cognition, intelligent user interfaces, help systems, and strategies to guide the learning experience.

#### **2.4.2 Computer-Assisted Language Learning Approach**

Recognizing the crucial role of technology in teaching and learning second or foreign languages has solidified CALL as an essential approach. Kumar and Sreehari (2009) define it as an engaging method of instruction, enabling learners to progress at their own pace and ability. It integrates computer technology in teaching and learning processes, including presentation, practice, and feedback. Educators now prioritize effective integration strategies to apply the full potential of technology in their teaching methodologies. As mentioned by Butler-Pascoe (2011):

The importance of technology in a second language or foreign language teaching is now well established with teachers no longer questioning the need for Computer-Assisted Language Learning (CALL) but rather seeking the most effective ways for integrating technology into their teaching (p. 1).

The emergence of this innovative theory enabled education to integrate and align with diverse teaching and learning methodologies. In particular, Krashen's Input Hypothesis proposes that learners acquire language best when they receive input that is one-step beyond their current level of proficiency (Krashen, 1982). In alignment with this, Zhang (2021) claims that CALL has the potential to enhance this process by offering learners customized input that adjusts to their proficiency level and individual needs. Furthermore, Azmi (2017) notes that integrating CALL in EFL classes has multiple advantages, including boosting motivation, enhancing critical thinking, fostering creativity, engagement, communication, investigation, collaboration, and improving students' language skills in written evaluations. Thus, CALL significantly advances English instruction with these benefits.

#### **2.4.3 Computer-Mediated Communication Approach**

Although CMC is a relatively recent field of study, the widespread use of computers in various sectors such as education, industry, and government indicates its significant growth (Ferris, 1997). Moreover, December (1997) delineates CMC as the use of computers for human interaction within specific contexts and various processes to create media objectives.

Likewise, several investigators categorically define CMC as a collection of text-based connections facilitated by electronic devices, including instant messaging, email, online forums, social media, and other computer-supported communication technologies (Thurlow et al., 2004). These interactions enable individuals to engage in written exchanges, share information, express thoughts and opinions, collaborate on projects, and form virtual communities. CMC offers several pedagogical benefits on the metalinguistic aspects of language, including improvements in grammar, vocabulary, speaking, and writing skills. It enables collaborative interaction among L2 learners and native speakers by providing meaningful and contextualized opportunities for self-correction and significant communication, amplifying L2 learning while reducing contextual restrictions imposed in traditional classroom settings (Kitade, 2000).

Besides, CMC connects remote learners, enabling them to engage in collaborative learning by actively participating in discussions and exchanging information within learning networks (Bligh, 1996). Further, Graham and Scarborough (1999) define Collaborative Learning as the process in which individuals work together to acquire or enhance knowledge, skills, attitudes, create meaning, and explore topics. It prioritizes cooperative endeavors among students and

the creation of knowledge rather than merely transmitting it.

#### **2.4.5 Pedagogical Applications of Chatbots in the English Classroom**

Numerous scholars have researched the subject of chatbots, resulting in a range of definitions that collectively emphasize diverse functionalities and applications. Primarily, Gupta et al. (2022) delineate a chatbot as “a Computer Software that helps develop a conversation with the user naturally” (p. 111). Unlike general chatbots, Educational Chatbots (ECs) are described as an IoT platform capable of transforming education and achieving pedagogical objectives. Utilizing ECs has become an integral part of the learning process for students, allowing them to take control of their learning and ultimately leading to better outcomes in terms of quality and effectiveness (Winkler & Söllner, 2018).

Educational Chatbots exhibit diverse functions, including scaffolding support, customized instruction, real-time feedback, and adaptive learning; thus, enhancing the learning experience. Burkhard et al. (2022) argue that chatbots can promote education by serving as subject experts, organizing tasks, answering questions, and providing feedback to facilitate learning. Chatbots are capable of performing these complex tasks due to their sophisticated systems. For instance, as Yi and Petrina (2013) contend, chatbot architecture employs language models and algorithms to imitate informal human-computer conversation, enabling users to interact via text or voice input with corresponding text or audio output.

Moreover, chatbots optimize English productive skills through interactive technology by fostering autonomous learning and proficiency. According to Fryer and Carpenter (2006), Chatbots enhance language learners' skills by enabling free speaking practice, identifying writing issues, guiding peer reviews and research, allowing self-analysis of learning progress, and providing access to student-bot conversations and progress tracking for teachers. Consequently, chatbots can enhance individualized learning and support for various educational tasks, making them a promising tool in education.

#### **2.5 Conclusion**

This chapter has explored the fundamentals of the EFL/ESL classroom, linguistic competence focusing on speaking and writing skills, and the implementation of ICTs and AI in language education. By analyzing definitions, theories, and empirical studies, a comprehensive understanding of these domains has been provided. The theoretical framework offers insights into the principles and pedagogical approaches prioritizing language skill development, cultural awareness, and effective communication. Furthermore, it emphasizes the importance of productive skills in achieving language fluency and proficiency. Integrating ICTs and AI in EFL/ESL classrooms can enhance learner autonomy, provide access to reliable resources,

and offer tailored feedback. By adopting these theories and technologies, educators can create engaging environments, which foster language proficiency. Thus, this section lays the groundwork for further examination of integrating chatbots in EFL/ESL instruction and their practical applications.

## Chapter III

### Literature Review

#### 3.1 Introduction

The chapter presents significant findings and insights obtained from the analysis of 15 studies. This literature review delves into the potential of chatbots as educational tools for enhancing Productive skills in both EFL and ESL classrooms. The research unveils various advantages and disadvantages associated with the implementation of chatbots to boost these skills. chatbots can assist students in constructing and expressing their thoughts through both written and spoken language. Additionally, this study conducts a review of existing research to assess the effectiveness and impact of this innovative tool. Therefore, the studies have been sorted into four subcategories: Integrating AI chatbots in EFL and ESL Classrooms, Examining Chatbots' Benefits and Drawbacks to Improve Writing Skills, Analyzing Chatbots' Advantages and Disadvantages to Enhance Speaking Skills, and Students and Teachers' Perceptions of Chatbot Integration in EFL/ESL Classrooms.

#### 3.2 Integrating AI Chatbots in EFL and ESL Classrooms

Lately, several studies have explored the integration of AI chatbots in EFL and ESL classrooms, indicating common patterns in how these chatbots are being incorporated into language education. Building on this, Chien et al. (2022) investigated the impact of using an Artificial Intelligence Markup Language (AIML) based LINE chatbot with a competitive approach to increase motivation and enhance English listening and speaking skills of 73 high school students in Taiwan. The study adopted a non-randomized control group, a pre-test to evaluate the learners' initial capabilities and behavior, and a post-test to measure the participants' English listening and speaking proficiency.

Moreover, in a distinct study centered in Taiwan by Lin and Mubarak (2021), the focus was on the application of mind map-guided AI chatbots in an EFL flipped classroom. The study involved 50 students, with chatbots assisting them in various language activities related to particular speaking topics, such as self-introduction, discussing animals, and describing beautiful locations. Likewise, researchers compared students' performance and language use in the experimental and control groups. Students in the experimental group learned how to create mind maps and received learning materials before interacting with AI Chatbots. Nonetheless, the control group used conventional AI chatbots without mind-map guidance. Combining the findings of both studies held by Chien et al. (2022) and Lin and Mubarak (2021) in Taiwan, the integration of AI chatbots demonstrated a positive impact on learners' motivation and language skills, with improvements in English listening and speaking

proficiency, and attitudes toward language learning, thereby emphasizing the effectiveness of AI-based chatbots in enhancing language education.

Similarly, Obari et al. (2020) explored the integration of AI and Virtual Reality (VR) with blended learning in Japan, employing a case study methodology. With 82 undergraduates as participants, the study aimed to enhance reading, writing, listening, and speaking skills using these emerging technologies. The instruments included the Test of English for International Communication (TOEIC), Oral Proficiency Interview Computer (OPIC), and post-training surveys. The findings demonstrated significant improvements in participants' TOEIC and OPIC scores, highlighting the efficacy of the program. Furthermore, in another study held in Japan, Dizon (2020) conducted a quasi-experimental research with a mixed method, evaluating the use of Intelligent Personal Assistants (IPAs), specifically Alexa, for L2 listening and speaking development. Involving 37 first and second-year EFL students, the study utilized listening and speaking assessments, a questionnaire, a semi-structured interview, and classroom observations. The results indicated a positive impact of using Alexa on students' L2 listening and speaking development.

### **3.3 Examining Chatbots' Benefits and Drawbacks to Improve Writing Skills**

In the inquiry of benefits and drawbacks of using chatbots to improve writing skills, distinct studies have provided valuable insights. In particular, Hang (2023) conducted a mixed-method research at Van Lang University in Vietnam, investigating EFL teachers' perspectives on ChatGPT's role in writing classes. The study, involving 20 EFL instructors, revealed a positive viewpoint on ChatGPT's impact on academic writing. Teachers acknowledged its efficacy in saving time on grading, providing feedback, and supporting lesson planning. Likewise, ChatGPT was recognized for its potential to enhance students' writing skills by suggesting reading resources, improving grammar and vocabulary understanding, and boosting learning motivation.

Expanding the scope to AI-generated feedback on writing, a mixed-method study carried out by Lin and Chang (2020) in Canada focused on the impact of a chatbot on improving writing skills among 36 post-secondary students. The findings indicated that the use of chatbots positively influenced students' writing skills, as evidenced by improved essay scores. The students showed a positive outlook on chatbot support, highlighting the advantages of receiving instant feedback, clarifying doubts during instruction, and becoming more engaged in writing lessons.

Notwithstanding, both studies admitted certain drawbacks. Hang's (2023) investigation noted the need for careful consideration of teacher training and concerns about academic integrity and privacy. Additionally, a neutral perspective among participants regarding ChatGPT's role



in grading and assessments was identified. Lin and Chang's (2020) study revealed limitations including the need to regulate students' writing proficiency, the potential originality effect in short-term performance improvement, and the general control of chatbots' natural language understanding.

### **3.4 Analyzing Chatbots' Advantages and Disadvantages to Enhance Speaking Skills**

Examining four distinct studies on the integration of chatbots in speaking skills enhancement displays both similarities and differences in their findings. In particular, Belda-Medina and Calvo-Ferrer's study (2022) conducted in Spain, involving 176 undergraduates, employed a mixed-method approach to investigate chatbots as conversational partners in language learning. The participants' engagement with chatbots, with an average of one hour per day for a duration of four weeks, resulted in high levels of satisfaction. The advantages consisted of decreased language anxiety, wide availability, multimodal practice, and effective feedback. Nevertheless, disadvantages included the perceived unnaturalness of the computer-generated voice and issues with failed communication during interactions.

Han's study (2020) in South Korea, with 44 middle school participants, focused on the effects of voice-based AI chatbots on speaking competence and affective domains. This quantitative study found positive influences on both aspects, emphasizing chatbots' benefits in providing opportunities for language practice, acting as language tutors, and facilitating individualized interactions. However, the study warned against the limitations of chatbots in fully replacing human interactions for language acquisition, due to their inability to simulate human expressions and social behaviors.

Mahmoud's research (2022) in Egypt, which included 156 undergraduate students, aimed to analyze the effectiveness of conversational chatbots in EFL speaking classes. The study utilized a questionnaire, a chatbot, and pre-test and post-test oral tasks. Similar to the previous investigations, Mahmoud found that chatbots significantly improved speaking performance. Advantages encompassed chatbots serving as a source of support for learning activities, providing motivational reinforcement, and facilitating role-playing scenarios. Nonetheless, concerns were raised about the mechanical and repetitive nature of chatbot responses, leading to potential inaccuracies. Besides, Shazly's study (2021) in Egypt explored the effects of AI-driven applications on speaking anxiety and performance among 48 EFL learners. Utilizing a quasi-experimental mixed model design, the research concluded that AI chatbots, with timely and customized feedback, may reduce anxiety and improve speaking proficiency by providing a more comfortable environment for language learning, increasing learners' motivation and confidence, and promoting linguistic output gains. Notwithstanding, the findings pointed out that AI chatbots are unable to replace human interaction, personalized



feedback, and emotional support, which are necessary for effective learning. Furthermore, they are unable to comprehend learners' emotions beyond the text they produce. Finally, AI chatbots have limited capabilities in identifying and rectifying errors that are more complex.

### **3.5 Students and Teachers' Perceptions of Chatbot Integration in EFL/ESL Classrooms**

When exploring the use of chatbots in English language education, a relevant theme arises concerning the different views of teachers and students in various situations. Hakim and Rima (2022) accomplished a qualitative descriptive study in Indonesia that uncovered students' slight responses to chatbots, with the bot "ANDY" eliciting the most positive feedback and "ELIZA" the most negative. The students engaged in conversations with different chatbots that utilize natural language processing and subsequently documented their reactions and impressions of the interaction. Chatbot Andy received the highest positive feedback at 86% in a questionnaire applied, while some students expressed neutral views with neither positive nor negative expressions toward the chatbots. This positivity resonates with Chuah and Kabilan's (2021) research in Malaysia, where ESL secondary school teachers displayed favorable views toward the use of Chatbots in English language teaching. The Malaysian teachers perceived chatbots as a valuable tool with the potential to support and enhance language learning in a technology environment. The research gathered data from the educators through an online survey, achieving a response rate of approximately 92%. Participants were instructed to integrate chatbots into their mobile English language teaching practices for a duration of two months. Tasks enclosed the completion of weekly logs with the chatbots, addressing various topics. Additionally, open-ended questions aimed at qualitative observations on specific factors.

Furthermore, Kim et al.'s (2021b) investigation in South Korea revealed that AI chatbots enhance English-speaking skills in foreign language learners, particularly in voice-chatting mode. The quasi-experimental study encompassed 110 university students engaging in three weekly speaking activities. Post-test results favored the voice-chatting group, exhibiting higher overall speaking scores, confidence levels, and lower stress. Despite positive outcomes, challenges emerged, including miscommunication due to pronunciation issues, chatbots' voice recognition problems, irrelevant responses, and non-fluid conversations. Learners also expressed discomfort during interviews, emphasizing the need for chatbot improvements to enhance user interaction in language learning.

Likewise, Enzelina et al. (2023) administered an explanatory sequential mixed-method study in Indonesia, exploring the perceptions of lecturers and students in English Language Education post-pandemic. Their findings revealed a positive perception of AI-based applications, emphasizing benefits such as increased engagement, motivation, and

overcoming communication barriers in online learning. However, the study also found negative perceptions of the use of chatbots. For instance, AI-powered applications currently lack proper guidance and hinder the ability to interact with lecturers. Thus, it is essential to ensure that teachers provide explicit and accurate instructions for the efficient utilization of AI-powered applications. Moreover, their effectiveness is somewhat limited in learning English and improving one's personality through education.

Çakmak (2022) conducted research on the impact of chatbot-human interaction on the L2 speaking performance and anxiety of 40 Turkish university students enrolled in an English conversation course. Using the chatbot Replika, the study employed a quasi-experimental design with pre and post-tests to assess participants' speaking performance and anxiety levels during task completion. In essence, students found the chatbot helpful for improving their speaking performance but had a negative overall impression of it as an English conversational partner. This suggests that the quality of chatbot interactions is important for reducing speaking anxiety and that developing more advanced systems could improve communication during chatbot interactions.

### **3.6 Conclusion**

In this chapter, the literature review emphasizes the growing importance of integrating AI chatbots in EFL and ESL classrooms for language skill enhancement. The studies presented a thorough analysis of chatbots' application in developing writing and speaking skills. These demonstrated consistent positive impacts on motivation, proficiency, and attitudes across diverse contexts. Notwithstanding, factors like teacher training, privacy concerns, and the imperative for enhanced chatbot interactions were taken into account.

As educators navigate the evolving landscape of language education, these findings offer crucial insights for informed pedagogical decisions and optimizing AI chatbot use in English language classrooms.

## Chapter IV

### Methodology

According to Cooper et al. (2009), a research synthesis is a set of secondary literature reviews in which empirical studies are integrated. In line with this, Norris and Ortega (2006) stated that “Research synthesis pursues systematic (i.e., exhaustive, trustworthy, and replicable) understandings of the state of knowledge that has accumulated about a given problem across primary research studies” (p. 11). Researchers use this study type to focus on relevant theories and analyze various facets of a problem or research gap.

In concordance with these authors, the present research synthesis intends to discuss the benefits and limitations of a field of study. The resources for this research were digital since they were easier to acquire on digital databases. Thus, in order to obtain meaningful and reliable resources, data was collected from the following online databases: DOAJ Journals, ProQuest Educational Journals, Dialnet, ERIC Institute of Education Science, Semantic Scholar, ResearchGate, Cambridge University Press, and SpringerOpen. The key terms that were used to search for data in this study were the following: AI, ICTs, Chatbots, AI-Based applications, Voice-based AI chatbots, Productive Skills, Writing skills, Speaking skills, EFL and ESL classrooms, CALL, CMC, English language teaching and learning, and Students and Teachers’ perceptions.

The studies for this research synthesis met the following inclusion criteria:

- These were published in peer-reviewed journals and reliable online databases.
- The articles were empirical, as readers had to identify researchers’ experiences with integrating chatbots into EFL/ESL classrooms.
- The articles encompassed various research methods, such as quantitative, qualitative, and mixed methods. These different approaches were instrumental in formulating the research questions. Qualitative data analysis involved exploring perceptions, comments, and reactions, while quantitative data analysis concentrated on examining effects, causes, strategies, and outcomes.
- The studies centered on the use of chatbots in education to align with research objectives.
- The studies referred not only to the benefits but also to the constraints of chatbots usage to improve students’ productive skills regarding writing and speaking skills.
- The articles were specifically predicated on the English language, as it was the language of interest for both teachers and students.

- Finally, the studies that were used for the research had to be published during the last 10 years, as this is a current topic of research.

The articles for this research synthesis considered the following exclusion criteria:

- Those studies that were published more than 10 years ago because of their updated condition.
- The studies whose participants did not belong to EFL or ESL contexts.
- The studies that were not empirical and were not from academic sources.

Additionally, the most relevant journals reviewed were the following: *International Journal of English Linguistics*, *International Online Journal of Education and Teaching (IOJET)*, *Opening Writing Doors Journal*, *Interactive Learning Environments*, *International Journal of Internet, Broadcasting and Communication*, *Directory of Open Access Journals (DOAJ)*, *International Journal of Science and Research (IJSR)*, and *Korean Journal of English Language and Linguistics* due to its current research on emerging technologies.

Lastly, an exhaustive coding process was performed with the purpose to classify the articles according to the criteria that emerged through the analysis.

## Chapter V

### Data Analysis, Results, and Discussion

#### 5.1 Introduction

Fifteen studies are selectively chosen for this research synthesis to address pertinent research questions. After analyzing these investigations, several categories are identified, including the research focus, location of the studies, research methodology, effects of AI chatbots on writing skills, the impact of AI-powered chatbots on speaking skills, and students and teachers' perceptions and attitudes on chatbots in EFL/ESL classrooms. Furthermore, tables are used for better presentation and illustration of the findings.

#### 5.2 Research Focus

Most research on applying chatbots to enhance productive skills in EFL and ESL classrooms focuses on investigating their impact on various aspects of English language teaching and learning. Besides, studies examine teachers and students' perspectives on using AI Conversational Agents in the English classroom. Categorizing articles based on their research focus eases data organization, providing the basis for the subsequent tables.

**Table 1**

*Research Focus*

Focus	N° of studies	Percentage	Authors/ Year
Exploring AI Chatbot Integration in EFL/ESL Environments	4	27 %	Chien et al. (2022); Lin & Mubarak (2021); Obari et al. (2020); Dizon (2020)
The use of Chatbots to enhance Writing Skills	2	13 %	Hang (2023); Lin & Chang (2020)
The use of Chatbots to enhance Speaking Skills	4	27 %	Belda-Medina & Calvo-Ferrer (2022); Han (2020); Mahmoud (2022); Shazly (2021)
The perceptions of teachers and students using Chatbots	5	33 %	Hakim & Rima (2022); Kim et al. (2021b); Çakmak (2022); Enzelina et al. (2023); Chuah & Kabilan (2021)

*Note.* N= 15

Table 1 outlines four categories describing the focus of the revised studies. The research aims to determine the potential impact of AI-powered chatbots on language teaching and learning, including enhancing communication skills and evaluating teachers and students' perceptions and attitudes toward chatbot implementation.

In the first category, four studies explore AI technologies incorporation in EFL and ESL learning contexts. These studies analyze different approaches, which include using AI Markup Language-based chatbots and Mind Map-guided AI chatbot methodologies in flipped classrooms to assess their impact on speaking skills. Researchers also seek to evaluate the potential of virtual assistants in aiding the development of second language listening and speaking skills. For instance, Dizon (2020) assesses Alexa's impact on L2 listening comprehension and oral proficiency, alongside exploring students' perspectives on its usefulness in formal language learning. Overall, the research aspires to enhance our understanding of how AI technologies can be integrated into language learning environments to optimize learning outcomes.

In the second category, two studies aim to improve writing skills using chatbots. In this case, AI Conversational Agents assist educators and learners to improve the clarity, conciseness, and grammar of their writing. Similarly, teachers can implement technology-based tools, such as ChatGPT, in their writing classes to facilitate and develop their students' writing skills.

Furthermore, four studies in the third category currently investigate the direct impact of AI chatbots on enhancing students' speaking skills, recognizing speaking as a challenging skill to develop. A thorough analysis of how incorporating digital assistants can improve speaking and writing skills will be covered in the following sections.

Lastly, five studies focus on the perceptions of instructors and pupils regarding chatbot use in EFL/ESL classes. Understanding these perspectives is crucial to determining the effectiveness of any technological tool in language instruction. To exemplify, Kim et al. (2021b) state that learners had positive perceptions about using AI chatbots for speaking practice, supported by descriptive statistics and participant interviews. Moreover, researchers establish that teachers and students have different opinions about using virtual assistants in language instruction. Both groups see the potential for authenticity, but teachers worry about accuracy while students have varied perceptions. However, using chatbots positively influences EFL learners' speaking and writing performance without increasing anxiety (Çakmak, 2022; Hakim & Rima, 2022).

### 5.3 Location of the Studies

**Table 2**

*Location of the studies*

Location	N° of studies	Percentage	Authors/year
Africa	2	13 %	Mahmoud (2022); Shazly (2021)
Asia	11	73%	Chien et al. (2022); Lin & Mubarak (2021); Obari et al. (2020); Dizon (2020); Hang (2023); Han (2020), Hakim & Rima (2022); Kim et al. (2021b); Çakmak (2022); Enzelina et al. (2023); Chuah & Kabilan (2021)
Europe	1	7%	Belda-Medina & Calvo-Ferrer (2022)
North America	1	7%	Lin & Chang (2020)

*Note.* N = 15

Table 2 displays the geographic distribution of the studies, with eleven out of fifteen conducted in Asia, two in Africa, one in North America, and one in Europe. Hence, researchers investigate the impact of chatbots on both students and teachers in educational environments across Asia. Besides, four studies delve into their potential advantages in other regions, particularly areas with advanced technological infrastructure. According to research, AI chatbot implementation is a current topic in EFL and ESL classrooms in Asia due to technological advances in the territory. For instance, Enzelina et al. (2023) and Han (2020) argue that educational systems are constantly evolving to meet current demands. To enhance language-learning experiences, AI chatbots are being integrated into foreign language classrooms. Likewise, educators and students are trained to adapt to the evolving educational landscape and effectively utilize innovative tools for language acquisition. Asian societies quickly integrate AI assistants as a solution for innovative language learning due to their strong education culture and technological advancements.

On the other hand, in Africa, Europe, and North America, chatbot integration is less prevalent. Nonetheless, research on the use of chatbots in education has begun in these three continents, and there are promising projections for their future application in the field.

This investigation finds that none of the fifteen studies reviewed were conducted in Latin America. After carrying out this research, there is a shortage of studies available on implementing chatbots to improve productive skills in EFL and ESL classrooms in Latin America. Nevertheless, one study by Belda-Medina and Calvo-Ferrer (2022) alludes to the Hispanic context due to language similarities. The study is conducted on Spanish and Polish participants. Both groups rate the overall usefulness of chatbots similarly, but Spanish participants are more familiar with Intelligent Personal Assistants (IPAs) than Polish

participants are. Researching the use of chatbots for language learning in both Spanish and Polish contexts provide valuable insights into how cultural and linguistic factors may influence the adoption and perception of such technology. It allows a comparative analysis to inform the development and implementation of chatbot-based language learning tools tailored to specific linguistic communities.

Considering our geographical location, it is pertinent to explore the importance of territorial proximity in educational research, with Canada serving as a potential point of reference for our context. As evidence, Lin and Chang (2020) reveal that learners who use a chatbot perform better in writing essay outlines compared to students who do not use one. The students also report positive feedback on their learning experience. The study concludes that chatbots can be valuable tools in supporting writing activities in higher education institutions across Canada. Drawing upon successes in Canada's education, implementing chatbots in our education systems may enhance learning outcomes and teachers and students' experiences.

However, more research is needed to fully understand what can be achieved through the use of this tool in Latin America and Ecuador. It is imperative to consider the research gap in our region as it may indicate the need for further investigation regarding the implementation of AI chatbots in English classrooms.

#### 5.4 Research Methodological Approaches

**Table 3**

*Research Methodological Approaches*

Focus	N° of studies	Percentage	Authors/year
Qualitative	1	7 %	Hakim & Rima (2022)
Quantitative	5	33 %	Chien et al. (2022); Lin & Mubarak (2021); Obari et al. (2020); Han (2020); Chuah & Kabilan (2021)
Mixed-method	9	60 %	Dizon (2020); Hang (2023); Lin & Chang (2020); Belda-Medina & Calvo-Ferrer (2022); Mahmoud (2022); Shazly (2021); Kim et al. (2021b); Çakmak (2022); Enzelina et al. (2023)

*Note.* N = 15

According to data in Table 3, most of the studies, nine out of fifteen adopt the mixed method to collect data. Five studies employ a quantitative approach, while only one study focuses on a qualitative technique. The data indicates that mixed methods are more commonly employed for data collection than either quantitative or qualitative approaches. This may be attributed to



researchers commonly using a combination of both methods to comprehend and interpret their studies' essence.

In particular, Enzelina et al. (2023) employ the explanatory sequential mixed-method approach to gather data via a combination of questionnaires and interviews. The questionnaire has close-ended questions with a Likert scale measurement to limit each answer for easier classification in quantitative data analysis. Moreover, interviews are conducted with EFL teachers and selected students to gather varied data results and their insights on AI-based chatbots in post-pandemic learning. In other words, they use both qualitative and quantitative research methods to bring more depth and context to their findings.

Equally, Çakmak (2022) applies the mixed-method approach to understand how chatbot-human interaction influences EFL learners' L2 speaking performance and anxiety. This approach facilitates the collection of both quantitative and qualitative data, enabling a thorough exploration of chatbots' effectiveness in language learning. Quantitative data is acquired through pre and post-tests, while qualitative insights are derived from open-ended survey questions and focus group interviews. The combination of these research methods provides a complete understanding of how chatbot-human interaction affects the L2 speaking performance and anxiety of EFL learners.

Conversely, a significant percentage of studies use quantitative methods for data collection. As evidence, Han (2020) uses the quantitative method to collect and analyze data which includes pre-test and post-test scores to measure changes in speaking competence and pre- and post-surveys to assess changes in effective domains towards language acquisition. Descriptive statistics and paired sample t-tests are used to analyze the data.

## 5.5 Effects of the Use of AI Chatbots on Writing Skills

**Table 4**

*Effects of the Use of AI Chatbots on Writing Sub-skills and Systems*

Authors/Year <sup>a,b</sup>	Providing Feedback	Grammar and Vocabulary	Organization and Structure	Editing and Revising
Lin & Chang (2020)	✓		✓	✓
Hang (2023)	✓	✓	✓	✓
Chuah & Kabilan (2021)	✓	✓	✓	✓

Note. N= 3

<sup>a</sup> Only studies that mention the improvement of students' writing sub-skills and systems are considered.

<sup>b</sup> Studies are counted in more than one category.

Table 4 reveals the importance of chatbots implementation on the sub-skills of students' writing. To fully grasp this category, it is essential to recognize that each macro skill, specifically writing, includes various sub-skills. It is also important to recognize that both grammar and vocabulary are considered parts of language systems. According to Carvalho (2021), four language systems work together to make communication coherent and understandable: grammar (structure), vocabulary (lexicon), pronunciation (in phonology), and function (linked to discourse). Both grammar and vocabulary are included in this research. Additionally, the study examines sub-skills such as providing feedback, organizing and structuring, and editing and revising.

Primarily, two studies analyze the effect of chatbots on improving writing sub-skills in this category. To exemplify, Chuah and Kabilan's (2021) and Hang's (2023) studies expose that AI conversational agents, like ChatGPT, hold great potential in enhancing students' writing skills. This potential encompasses idea development, organization and structure, grammar and vocabulary, and editing and revising. Additionally, teachers show interest in incorporating chatbots into ESL instruction. However, there are still concerns about the accuracy of these virtual assistants, especially in correcting students' grammar. Notwithstanding, with customized design and precise language input, chatbots can boost student engagement and promote autonomous learning. Nevertheless, to enhance students' writing skills, it is crucial to address the accuracy issues associated with chatbots' responses. Overall, research suggests that chatbots can overcome these issues through the evolution of AI systems.

In addition, Lin and Chang (2020) investigate the importance of grammar and vocabulary in their analysis. Indeed, they concentrate their research on peer feedback, identifying issues during the editing and revising process, content creation, such as developing a thesis statement and supporting arguments, as well as language competencies such as vocabulary selection and paraphrasing.

While there may be a discrepancy in the quantity of research focusing on the use of chatbots to enhance writing skills compared to the development of speaking skills, the analysis of available data from pertinent studies reveals a notable absence in investigations centered on improving writing skills through chatbot intervention.

## 5.6 The Impact of Chatbots on Speaking Skills

**Table 5**

*The Impact of Chatbots on Speaking Sub-skills and Systems*

Author/Year <sup>a,b</sup>	Accuracy	Fluency and coherence	Grammar and vocabulary	Pronunciation
Chien et al. (2022)				✓
Lin & Mubarak (2021)	✓	✓	✓	✓
Dizon (2020)	✓	✓	✓	✓
Belda-Medina & Calvo-Ferrer (2022)	✓	✓	✓	
Han (2020)	✓	✓	✓	✓
Mahmoud (2022)	✓	✓	✓	✓
Shazly (2021)	✓			✓
Kim et al. (2021b)	✓	✓	✓	✓
Çakmak (2022)	✓	✓	✓	

*Note.* N = 9

<sup>a</sup> Only studies that mention the improvement of students' speaking sub-skills and systems are considered.

<sup>b</sup> Studies are counted in more than one category.

Table 5 depicts the impact of chatbots on speaking skills, with the sub-skills divided into three categories: accuracy, fluency and coherence, and pronunciation. It also categorizes the two language systems: grammar and vocabulary.

To begin with, one of the most important sub-skills reported in this section is accuracy, with eight out of nine studies focused on the use of digital assistants to develop speaking skills. According to research conducted by Kim et al. (2021b), the use of chatbots leads to a significant improvement in the accuracy of speaking performance. The study assesses participants' foreign language speaking proficiency based on their pronunciation, grammar, and sentence structure. They can practice these linguistic elements multiple times in a safe environment provided by the chatbot. Thus, using chatbots can be regarded as an effective tool for enhancing language-speaking accuracy.

In terms of fluency and coherence, Shazly (2021) mentions that AI programs can help with automatic speech recognition, computer-assisted pronunciation, and error recognition in writing. In addition, chatbots can analyze the learners' abilities and interests to engage them in meaningful language tasks, leading to better fluency and coherence in speaking.

In the case of grammar, vocabulary, and pronunciation, according to Han's findings (2020), the use of voice-based AI chatbots results in a significant enrichment for students, not only in their pronunciation and fluency, but also in their language use, encompassing grammar and vocabulary when communicating in English. Therefore, research reveals that following interactions with AI chatbots, scholars demonstrate accurate employment of vocabulary and grammar, as evidenced by the significant mean difference between pre- and post-tests. Indeed, this technology might aid in developing accurate pronunciation and improving speaking performance.

### 5.7 Students and Teachers' Perceptions and Attitudes regarding the Implementation of Chatbots in EFL/ESL classrooms

**Table 6**

*Students and Teachers' Perceptions and Attitudes Regarding the Implementation of Chatbots in EFL/ESL classrooms*

<i>Positive Perceptions</i>	<i>N° of studies</i>	<i>Authors/Year <sup>a_b</sup></i>
Confidence and Reliability	3	Hakim & Rima (2022); Kim et al. (2021b); Chuah & Kabilan (2021)
Accessibility, Usability, and Flexibility	3	Kim et al. (2021b); Chuah & Kabilan (2021); Shazly (2021)
Immediate Feedback Provision	3	Kim et al. (2021b); Enzelina et al. (2023); Chuah & Kabilan (2021)
Enhancement of Speaking and Writing Performance	4	Çakmak (2022); Enzelina et al. (2023); Chuah & Kabilan (2021); Hang (2023)
Others: Content Generation Lesson Planning Support	1	Hang (2023)
<i>Negative Perceptions</i>	<i>N° of studies</i>	<i>Authors/Year <sup>a_b</sup></i>
Communication Issues	5	Hakim & Rima (2022); Kim et al. (2021b); Çakmak (2022); Chuah & Kabilan (2021); Hang (2023)
Limitations on Natural Conversation Practice	3	Hakim & Rima (2022); Kim et al. (2021b)
<i>Attitudes</i>	<i>N° of studies</i>	<i>Authors/Year <sup>a_b</sup></i>
Engagement	2	Hakim & Rima (2022); Kim et al. (2021b)
Motivation	4	Kim et al. (2021b), Enzelina et al. (2023); Hang (2023); Çakmak (2022)

Anxiety

4

Çakmak (2022); Shazly (2021); Kim et al. (2021b); Enzelina et al. (2023)

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*Note.* N = 7

<sup>a</sup> Only studies examining perceptions of students and teachers towards chatbots are included in the research.

<sup>b</sup> One study can be included in multiple categories.

Table 6 presents the perceptions and attitudes of both students and educators towards chatbots as an innovative educational tool into EFL/ESL classrooms, encompassing both positive and negative views. Seven studies are selected to analyze the ideas and opinions of learners and educators regarding the implementation of digital assistants to improve communication skills. The data results from all seven investigations are classified and presented in Table 6 under their respective categories. The table is divided into three categories: positive perceptions, negative perceptions, and attitudes toward chatbots among apprentices and professors.

As a starting point, the use of AI Conversational Agents plays a significant role in boosting students and teachers' academic performance, encompassing five categories of positive views. For instance, two out of the seven research papers discuss confidence and reliability in their findings. Chuah and Kabilan (2021) find that chatbots can improve the confidence of ESL students in using the language by creating a sense of social presence, even though they offer limited cognitive engagement. The study shows that ESL teachers notice an increase in students' proactivity and confidence when conversing in English with chatbots.

In the study conducted by Kim et al. (2021b), a similar phenomenon is observed. While chatbots may not replace human tutors entirely, they appear to be a reliable supplement to language learning. The study suggests that virtual assistants can promote speaking practices, reduce inhibitions, and provide additional opportunities for language proficiency. Teachers and students may rely on chatbots as a supplementary tool for practice and review, particularly when learners need more personalized attention.

Subsequently, three out of the seven studies describe the benefits of chatbot during user interaction from the perspective of students and educators regarding accessibility, usability, and flexibility. Building upon the findings of Shazly (2021), integrated AI chatbots offer greater flexibility, enabling autonomous and personalized participation that can be employed for educational purposes and provide a range of learning strategies.

One study explores teachers' perspectives on chatbots for teaching. In particular, Hang (2023) investigates educators' perceptions of integrating these innovative tools into teaching strategies. The study reveals that 80% of lecturers surveyed strongly agree that ChatGPT is effective in providing diverse educational materials that align with different learning needs and

learner profiles. Moreover, educators find ChatGPT helpful in creating customized learning experiences with tailored exercises and instructional activities based on specific lesson objectives, learners' language proficiency levels, and assessment criteria.

Moving into the negative perceptions, eight studies identify communication issues and limitations on natural conversation practice with chatbots. The investigations highlight several concerns with the use of chatbots, including difficulties in understanding instructions, limitations in speech recognition, and natural language processing. These are the most common issues that teachers and students face when interacting with virtual assistants. A relevant example is the research conducted by Hakim and Rima (2022), which examines the use of AI chatbots such as ELIZA, ALICE, MITSUKU/KUKI, and ANDY. A few students convey their discontent with ELIZA, stating that it is tedious and not captivating enough. Due to ELIZA's limited response capabilities, they find it challenging to have a meaningful conversation, resulting in a higher percentage of negative feedback compared to positive comments for ELIZA.

Similarly, Kim et al. (2021b) find that students struggle to maintain topic continuity when interacting with AI chatbots, resulting in fragmented conversations. Henceforth, digital assistants need to improve their ability to understand and respond to conversational cues naturally. Additionally, chatbots may struggle with context retention and lack advanced dialogue management abilities.

Researchers have observed that the use of chatbots in EFL/ESL environments is perceived differently by educators and learners due to their distinct attitudes. For that reason, Table 6 exhibits three different mindsets demonstrated by participants in the studies.

Through their analysis, Hakim and Rima (2022) prove that ANDY is the most preferred chatbot for English communication practice, with 86% of students giving positive feedback. This is attributed to its focus on learning and ability to correct mistakes. Users find ANDY beneficial in language acquisition and appreciate its ability to provide corrections and teach them proper English language use. Consequently, learners might find virtual assistants engaging and useful. Contributing to the examination of attitudes, Enzelina et al. (2023) discover that students tend to be more motivated when using AI-based applications. They appreciate the convenience and simplicity provided by AI tools when learning the English language.

Succeeding, current investigations show that interacting with the chatbot Replika significantly increases the level of speaking anxiety among EFL students. While chatbots have the potential to improve linguistic output gains, they may also intensify speech-related anxieties among learners (Çakmak, 2022; Shazly, 2021). Alternatively, chatbots are designed to simulate real-life interactions, providing learners with contextual comprehension, error correction, and text generation. These features can help to reduce learner anxiety, leading to improved language

skills. Studies show that participants who interact with AI voice chatbots achieve their original speaking scores. This suggests that AI interaction can be more engaging than face-to-face interaction with humans due to the reduced anxiety levels that users experience when interacting with intelligent assistants (Enzelina et al., 2023; Kim et al., 2021b).

### **5.8 Conclusion**

After analyzing the data, it can be inferred that the application of chatbots in EFL/ESL settings enhances students' productive skills. The six tables provide a comprehensive overview of the current landscape of AI chatbots in linguistic education. The study is focused on optimizing both written and oral communication proficiencies, with investigations covering diverse international contexts.

The methods investigated in the studies are diverse, but they all highlight the positive effects of virtual assistants on learners' writing competencies. Similarly, the impact on speaking skills is notably beneficial, as AI chatbots provide students with meaningful interactions for language practice. Surprisingly, more studies focus on using chatbots to improve speaking skills rather than writing skills. Certainly, AI Conversational Agents offer an interactive platform for learners to practice speaking in a low-pressure environment, which is more engaging and effective than traditional methods. The increasing popularity of voice-enabled technology has also increased interest in developing chatbots for speaking practice.

Furthermore, both students and teachers have positive perceptions and attitudes towards the use of digital assistants in English language classrooms, recognizing their potential and usefulness in facilitating language acquisition. This study highlights the effectiveness of chatbots as educational tools and emphasizes the need for further research to explore their full capabilities within language learning environments. Customizing research to the cultural context of Latin American and Ecuadorian learners can reveal insights into how AI tools may fulfill regional educational requirements. Lastly, the current data reflects short-term outcomes and longitudinal studies are needed to assess the long-term effects of AI tools on language learning.



## Chapter VI

### Conclusions and Recommendations

#### 6.1 Conclusions

This section provides an overview of the findings discussed in the previous chapter. The present study examines the integration of AI chatbots in enhancing productive skills within EFL/ESL classrooms. The synthesis of the literature reveals a consistent pattern of positive effects, aligning with the general objective to identify and analyze the impacts and implications of chatbot use in language learning as reported in pertinent literature. As part of the previous section, the fifteen studies were classified into six categories and coded to address the three research questions: What are the effects of the use of chatbots on the development of writing skills in an EFL/ESL context, as reported by the pertinent literature?; What are the effects of the use of chatbots on the development of speaking skills in the EFL/ESL context, as reported by the pertinent literature?; What are the students' and teachers' perceptions of the implementation of Chatbots to enhance productive skills in an EFL/ESL classroom? Based on the developed analysis, the following conclusions can be remarked.

The results of multiple studies, including those conducted by Chien et al. (2022), Lin and Mubarak (2021), Hang (2023), Lin and Chang (2020), Belda-Medina and Calvo-Ferrer (2022), and Han (2020), support the specific objectives by demonstrating the benefits and limitations of using chatbots to enhance the writing and speaking skills of EFL/ESL learners. These studies demonstrate the potential of AI chatbots to motivate learners and improve language skills, particularly in writing and speaking. Moreover, they examine the attitudes of both students and teachers towards chatbots integration into language learning, as evidenced by studies conducted by Hakim and Rima (2022) and Kim et al. (2021).

Furthermore, the findings are consistent with the theoretical framework laid out in Chapter Two, which emphasizes the importance of linguistic competence and the integration of ICTs and AI in language education. The studies reviewed support that chatbots can provide an anxiety-free environment, create repetitive content, and offer instant error correction, which aligns with the principles of CALL and CMC approaches. Both CALL and CMC can be complemented by AI chatbots, which serve as interactive tools that support language practice, provide instant feedback, and facilitate personalized learning experiences (Kumar & Sreehari, 2009; Thurlow et al., 2004).

Indeed, key contributions from authors such as Fryer and Carpenter (2006), Chien et al. (2022), and Obari et al. (2020) highlight the transformative potential of chatbots in language education. These studies underscore the role of chatbots in fostering learner autonomy, providing access to authentic resources, and offering tailored feedback.



## 6.2 Recommendations for Future Research

Future research should investigate the potential applications of chatbots in English language education, encompassing diverse cultural and linguistic backgrounds, to allow for broader generalization of findings. Longitudinal studies are also necessary to evaluate the lasting impact of chatbots on language proficiency and learner motivation. As AI technology advances, future investigations might probe the influence of more advanced Chatbots on English language learning outcomes. Additionally, further exploration is necessary to understand the required teacher training for effective integration of chatbots and to address concerns regarding privacy and academic integrity.

Further studies should prioritize the customization of chatbots to supply to the distinct needs of language learners at varying proficiency levels. Investigating the potential of chatbots to decrease levels of students' anxiety to foster more natural interactions is also essential. It is crucial to explore strategies for integrating AI chatbots in EFL/ESL classrooms to mitigate the lack of opportunities for practicing productive skills. This should be complemented by developing comprehensive teacher training programs to optimize the utilization of chatbots and digital tools in language education.

Advocating for increased investment in educational technology is imperative to overcome financial constraints, particularly in underdeveloped regions like Ecuador. By using chatbots to strengthen student motivation and confidence in English communication, we can bridge the gap in opportunities for practicing and enhancing language skills.

Overall, the present study affirms the positive impact of AI chatbots on language learning within EFL/ESL classrooms. It also highlights the need for ongoing research to optimize the use of this technology in Ecuadorian education. The recommendations provided aim to guide future investigations, ensuring that they are methodologically useful and theoretically grounded, ultimately contributing to the advancement of language teaching and learning.

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