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**EXPLORING THE IMPACT OF GARAMMALY AND QUILBOT ON WRITING  
FLUENCY FOR EFL STUDENTS.  
THE CASE STUDY THIRD-YEAR STUDENTS AT THE DEPARTMENT OF  
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To my mother, the steadfast anchor in the ever-shifting tides of my journey, your love is the bedrock upon which this work stands. To my friends and my tulip, the vibrant constellations that have illuminated the darkest nights, your presence has been my guiding star. And to all who find resonance in these words, your unseen threads have woven the fabric of this dissertation. This is for you

Sid Ali...

To my parents, whose limitless love and unwavering support have molded the core of my being. To my family, whose affection and joy have brightened my soul and to my friends, whose constant companionship and insight have been my guiding lights. This dissertation stands as a tribute to your profound belief in me, your enduring encouragement, and the countless moments that have lifted me up. With all my gratitude, I thank you.

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## Abstract

This study explores the use of artificial intelligence (AI) applications or tools in enhancing writing skills for English as a Foreign Language (EFL) learners. Traditional teaching methods often fall short in providing personalized feedback and engaging students in iterative learning practices. AI applications, such as Grammarly, Quillbot and other AI-powered writing assistants were chosen for the study because they offer innovative solutions by providing real-time, individualized feedback on grammar, vocabulary, style, and coherence. The study explores the historical development of AI in education, highlighting the surge in AI adoption due to the COVID-19 pandemic. It examines the roles of both teachers and students in integrating AI tools into the learning process. We used a mixed-method design, incorporating both quantitative and qualitative approaches to collect findings, a questionnaire and an experiment, the results of the findings were that educational institutions can maximize the potential of AI tools in enhancing the writing skills of EFL students and the questionnaire findings collectively suggest that AI tools are generally viewed as effective in enhancing English writing skills among students, concluding that collaborative initiatives between educators, policymakers, and technology developers are essential for creating a synergistic ecosystem where AI enhances human expertise, transforming writing instruction to empower EFL learners with proficiency, confidence, and creativity in their second language.

**Keywords:** Artificial Intelligence (AI) - - AI Applications in Education- Quillbot – Grammarly - role of teachers and students in integrating AI tools.

## ملخص

تستكشف هذه الدراسة استخدام تطبيقات أو أدوات الذكاء الاصطناعي في تحسين مهارات الكتابة للمتعلمين اللغة الإنجليزية كلغة أجنبية. غالباً ما تقصر طرق التدريس التقليدية في تقديم ملاحظات شخصية وإشراك الطلاب في ممارسات التعلم التكرارية. تم اختيار تطبيقات الذكاء الاصطناعي وغيرها من مساعدي الكتابة المدعومين بالذكاء الاصطناعي لهذه الدراسة لأنها تقدم حلولاً مبتكرة من خلال تقديم Quilbot و Grammarly مثل ملاحظات فورية وفردية حول القواعد والمفردات والأسلوب والتماسك. تستكشف الدراسة التطور التاريخي للذكاء الاصطناعي في التعليم، مشيرةً كما تفحص الدراسة أوار كل من المعلمين والطلاب في دمج أدوات الذكاء COVID-19 إلى الزيادة في تبني الذكاء الاصطناعي بسبب جائحة الاصطناعي في عملية التعلم. استخدمنا تصميمًا متعدد الأساليب، يجمع بين النهج الكمي والنوعي لجمع النتائج، بما في ذلك استبيان وتجربة. أظهرت نتائج الدراسة أن المؤسسات التعليمية يمكنها تحقيق أقصى استفادة من أدوات الذكاء الاصطناعي في تحسين مهارات الكتابة للطلاب المتعلمين اللغة الإنجليزية كلغة أجنبية. وتشير نتائج الاستبيان مجتمعةً إلى أن أدوات الذكاء الاصطناعي تُعتبر عموماً فعالة في تحسين مهارات الكتابة باللغة الإنجليزية بين الطلاب، وتخلص إلى أن المبادرات التعاونية بين المعلمين وصانعي السياسات ومطوري التكنولوجيا ضرورية لإنشاء نظام متكامل حيث يعزز الذكاء الاصطناعي الخبرة البشرية، محوّلًا تعليم الكتابة لتمكين المتعلمين اللغة الإنجليزية كلغة أجنبية من اكتساب الكفاءة والثقة والإبداع في التعبير عن أنفسهم بمهارة في لغتهم الثانية.

الكلمات المفتاحية: الذكاء الاصطناعي - (AI) تطبيقات الذكاء الاصطناعي في التعليم - Grammarly - Quillbot - دور المعلمين والطلاب في دمج أدوات الذكاء الاصطناعي.

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### **Acronyms**

**AI:** Artificial intelligence

**EFL:** English as a foreign language

**AIEd:** Artificial Intelligence in Education

**AES:** Automated Essay Scoring

**AC:** Automated Correction

**ITS:** Intelligent Tutoring System

**NMT:** Neural Machine Translation

### **Images**

**Image one:** timeline of AI history

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**Figure.01:** Timeline of AI history

**Figure.02:** familiarity with AI

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## General Introduction

We have long identified ourselves as *Homo sapiens*, or “man the wise,” recognizing the significance of our intelligence. Throughout history, we have endeavored to comprehend the workings of our minds—the remarkable ability of a small collection of matter to perceive, comprehend, anticipate, and influence a vast and intricate world beyond its physical scale (Russell, 1995). In today’s interconnected world, the field of education is undergoing dramatic development, particularly in the teaching and study of English as a Foreign Language (EFL). The introduction of Artificial Intelligence (AI) applications has resulted in a paradigm shift in language acquisition, providing innovative tools and resources to both instructors and students. This dissertation seeks to investigate the usefulness of AI applications in improving writing skills among EFL learners.

Artificial Intelligence, as described by Zhao (2022), refers to the replication of human intelligence using machines, specifically computer systems, to carry out tasks that often rely on human cognition, such as problem-solving and language comprehension. EFL refers to the simultaneous study and application of English by individuals whose native language is not English, particularly in areas where English is not the dominant language. EFL learners encounter numerous difficulties, particularly when it comes to acquiring advanced writing abilities, primarily because of differences in language and culture. The introduction of AI apps has become a crucial factor in language learning, as it provides individualized feedback, detects linguistic faults, and offers customized learning experiences that are specifically designed for individual needs (Zhao, 2022).

It can be difficult to define Artificial Intelligence (AI) even for experts. One reason is that what AI encompasses is constantly shifting. As Nick Bostrom explains, “a lot of cutting-edge AI has filtered into general applications, often without being called AI because once something becomes useful enough and common, it is not labeled AI anymore” (Holmes, 2016). Another reason for the difficulty in defining AI is the interdisciplinary nature of the field, involving anthropologists, biologists, computer scientists, linguists,

philosophers, and psychologists. For our study, we will define AI according to Professor Rose Luckin, who states that artificial intelligence (AI) has the capacity to transform education by offering customized learning experiences that cater to the specific requirements of each learner. AI-powered writing apps can provide tailored feedback, adaptive learning routes, and targeted linguistic support to meet the various needs and competence levels of EFL learners. These applications utilize natural language processing algorithms to examine pupils' writing habits, detect areas that need improvement, and provide customized suggestions for enhancement.

This study seeks to explore the impact of AI writing applications on enhancing writing skills in English as a Foreign Language (EFL) contexts. To investigate how such apps contribute to independent learning and self-correction among EFL students, their ability to adapt to learners' changing needs over time, and their role in fostering critical thinking through written communication. Additionally, we will address whether AI could potentially replace the teacher's role or serve as a valuable supplementary tool to streamline tasks in EFL instruction. Overall, these inquiries aim to assess the effectiveness and potential of AI applications in supporting EFL learning and teaching processes.

## **Research Questions**

- How effective are AI applications in improving EFL writing skills?
- What writing difficulties do EFL learners face, and how can AI help?
- What roles do teachers and students play in using AI tools?

## **Hypotheses**

- AI applications significantly enhance EFL writing skills.
- AI effectively addresses common writing difficulties in EFL.
- AI tools provide more effective feedback than traditional methods.

## **Aims of the Study**

- Evaluate the effectiveness of AI applications in EFL writing.
- Identify and address common EFL writing difficulties with AI.
- Analyze teacher and student roles in using AI for writing

## **Methodology Description**

We conducted the study with quantitative method of data collection from students of different level and analyzed the findings

## **Structure of the Study**

This study investigates teaching writing in English as a foreign language (EFL), covering its definition, various instructional approaches, techniques, and activities. It emphasizes the importance of writing instruction, explores roles of students and teachers, writing genres, and common challenges

## **Chapter one**

Writing in English as a foreign language

# **1. Writing in English as a foreign language**

## **1-1. Definition of writing**

Writing can be defined as the process of transforming ideas and opinions into language, which requires a significant amount of mental effort and practice. According to White and (Ardnt 1991), it also requires intellectual effort and includes generating ideas, planning, setting goals, observing what has been written and what will be written, as well as evaluating the use of language to express subtle meanings.

In another definition, writing is described as a system of graphic symbols that represent the elements of a specific language. The elements to be represented, whether individual sounds, syllables, parts of words, or a combination of these, depend on the structure of the language, societal needs and traditions, and the capabilities of the human brain. Writing is a broad term for a visual system distinct from art and a mode of language use that differs from speaking. In contrast, a writing system refers to a specific set of graphic symbols that represent types of linguistic units. Other terms for writing systems include script and orthography. Types of writing systems include alphabets (like the Roman alphabet), syllabaries (such as Cherokee or Ethiopic, which represent consonant-vowel syllables), abjads (like Arabic, which represent only consonants), and logo syllabaries (such as Chinese, which represent words).

Writing is inherently demanding and often undertaken in solitude (Di Loreto & McDonough, 2013). It involves a complex and time-consuming process, as noted by Nation (2008), requiring several sequential steps to generate a coherent written piece. Consequently, becoming proficient in writing in a second language is not merely a matter of mastering linguistic rules but also entails developing the willingness to engage in repetitive practice (Hyland, 1989). This can be tedious for some students since it involves composing a text, creating a logically connected sequence of paragraphs, and mastering grammar. Writing can be planned and revised multiple times before its final release.

Mastering writing skills, especially in English, is often perceived as the most challenging aspect of language learning (Xin, 2007; Shapo, Walter, & Fajans, 1995). Writing tends to be overlooked (Coker & Ritchey, 2015). It is inherently demanding and often undertaken in solitude (Di Loreto & McDonough, 2013). It involves a complex and time-consuming process, as noted by Nation (2008), requiring several sequential steps to generate a coherent written piece. Consequently, becoming proficient in writing in a second language is not merely a matter of mastering linguistic rules but also entails developing the willingness to engage in repetitive practice (Hyland, 1989). This can be tedious for some students.

## **1-2. Evolution of writing**

Writing systems independently emerged in Mesopotamia (circa 3200 BCE), China (circa 1250 BCE), and Mesoamerica (circa 650 BCE), marking significant communication innovations. In Mesopotamia, writing evolved from clay tokens used for counting commodities to abstract numerals on clay tablets around 3100 BCE in Uruk, facilitating complex economic records. By 3000 BCE, Sumerians employed phonograms to record names in a rebus-like system. Around 2700-2600 BCE, writing expanded beyond accounting when scribes inscribed funerary objects, ensuring the deceased's names were perpetually remembered. By 2500 BCE, writing included prayers on statues, adopted spoken language syntax, and merged with art, supporting diverse texts by 2000 BCE. Mesopotamian writing influenced other cultures, such as the Proto-Elamites and Egyptians, while the Indus Valley and Crete developed independent scripts.

The alphabet, invented around 1700 BCE in the Near East, likely in Lebanon, used 22 consonant letters and spread literacy due to its simplicity. Phoenicians disseminated the alphabet across the Mediterranean between 1000 and 300 BCE. By 800 BCE, Greeks added vowels, creating a 27-letter system. The Etruscans in the 8th century BCE adopted and modified the Greek alphabet, which evolved into the Latin alphabet, spreading throughout Europe with Roman expansion (Healey, 1990; Markoe, 2000; Whitt, 1995; Cook, 1987; Bonfante, 1990; Reynolds, 1991).

Later on, writing systems evolved alongside socioeconomics and technological advancements, shaping the course of human communication. Bruno Latour proposed a materialist explanation for the impact of writing on society, emphasizing the utility of representational devices in enabling stronger scientific arguments. Writing systems, including alphabets, spread for their practical advantages rather than inherent superiority. Looking forward, technological advancements pose challenges and opportunities for writing. Input methods for complex scripts like Chinese have evolved with computer technology, while the development of a universal standard for text encoding, like Unicode, ensures inclusivity in the digital age. Communication technologies, such as email and text messaging, continue to shape writing conventions with new symbols and abbreviations. As more of the world's languages are written down, the future favors the adaptability and widespread use of the Roman alphabet due to its technological compatibility and existing global adoption (Latour, 1986, 1990; Erard, 2003; French, 2000; Grimes & Grimes, 2005).

### **1-3. Techniques of Writing and Activities in EFL Classes**

The incorporation of various writing techniques and activities is pivotal in enriching language learning. According to Nunan (2003), “Task-based language teaching, involving students in communicative tasks, not only enhances language usage but also fosters the learning process itself

#### **1-3-1. Product Approach**

According to Silva (1990, pp. 11-17), this approach underscores the importance of form and syntax, thereby directing attention towards linguistic elements such as style and cohesive ties. The primary objective of the product approach lies in the attainment of mastery over linguistic features, treating language acquisition as a process akin to habit formation. In this paradigm, in another words the goal is for students to master these linguistic features by responding to teacher prompts and refining their writing skills.

### **1-3-2. The Process Approach**

The process approach emerged at the end of the 1960s as a reaction to the product approach. It gives attention to the way of writing rather than the final product, treating writing as creative work that takes time. In the writing process, the teacher does not need to give the student a topic to write about; they only need to receive the final work for correction without interfering in the writing process itself. Tribble (1966), describes the process approach as a means of creativity and as a way of improving writing, in the sense that learners go through different stages to produce a piece of writing. This approach helps them draw on their own cognitive abilities and start writing in creative ways rather than imitating a model.

### **1-3-3. Task-Based Writing**

In this approach, students engage in writing tasks that simulate real-life communication situations. These tasks could include writing emails, reports, essays, or creative stories based on specific prompts or scenarios.

### **1-3-4. Genre-Based Writing**

Students learn to write different types of texts or genres, such as narratives, descriptions, argumentative essays, or letters. They analyze the features and structures of each genre and practice writing them

### **1-3-5. Collaborative Writing**

This activity involves students working together in pairs or groups to brainstorm ideas, plan, draft, and revise a piece of writing. Collaborative writing fosters teamwork, peer feedback, and idea generation.

### **1-3-6. Peer Review**

Students exchange their written work with classmates for feedback and suggestions. Peer review helps students improve their writing skills, provides different perspectives, and encourages constructive criticism.

### **1-3-7. Grammar and Vocabulary Exercises**

Writing activities can also incorporate grammar and vocabulary practice, such as sentence completion, sentence combining, or using specific vocabulary words in context.

By integrating these diverse techniques and activities into EFL classes, educators can enhance the learning experience and equip students with the necessary skills to navigate language complexities in various contexts. By fostering an environment that values creativity, collaboration, and critical reflection, educators can significantly improve the effectiveness of their teaching and profoundly influence their students' linguistic and cognitive development.

### **1-4. Importance of Teaching Writing in EFL Classes**

Teaching writing in English as a Foreign Language (EFL) classes is of utmost importance, not only for enhancing language skills but also for nurturing critical thinking and cultural awareness. As Hyland (2003) asserts, writing is a multifaceted activity that involves the development and expression of ideas within social and rhetorical frameworks. This perspective highlights that writing is not merely about using language correctly; it is also about engaging in dialogue and asserting one's perspective. Moreover, writing facilitates deep cognitive engagement, allowing learners to reflect on language mechanics, as emphasized by Raimes (1983), who suggests that it provides an opportunity to contemplate language structure. Ferris and Hedgcock (2005) further underline the significance of writing as a life skill that transcends various contexts, enabling success in both academic and professional domains.

Additionally, writing plays a crucial role in fostering effective communication skills and cross-cultural understanding. Warschauer (2000) posits that writing serves as a powerful tool for empowered communication and self-expression, capable of bridging social and cultural divides. This perspective underscores how EFL learners can leverage writing to articulate their identities and viewpoints, contributing to a global discourse that transcends cultural barriers.

Moreover, integrating writing into EFL instruction enhances academic preparedness, equipping students for future educational pursuits where writing proficiency is essential. Leki (1992) emphasizes the importance of academic writing as a foundational skill for success at university and beyond, as it forms the basis for academic achievement. Mastery of writing in English enables EFL learners to effectively navigate the demands of academic writing, a prerequisite for pursuing higher education and professional opportunities in an increasingly globalized world.

### **1-5. Students' and Teachers' Roles in Writing Classes**

Within the dynamic realm of English as a Foreign Language (EFL) education, the collaboration between students and teachers in writing courses is essential for fostering linguistic expertise and effective communication skills. According to Silva and Matsuda (2001), the interaction between teachers and students is crucial in creating a favorable learning environment, especially when it comes to writing. The connection between the two parties is complex whereas students:

- actively engage in the writing process, including brainstorming, drafting, revising, and editing their work.
- writing classes with a growth mindset, recognizing that writing is a skill that can be developed through practice and feedback,
- construct meaning through their written texts, synthesizing information, expressing their thoughts, and communicating their ideas effectively to their intended audience,
- collaborate with their peers, providing feedback, sharing ideas, and engaging in peer review activities.

students play an active role in their learning process and have a mutual exchange with their instructors, using feedback as a catalyst for personal development and improvement. They are not just passive learners but active contributors to knowledge

as each brings distinct contributions to the teaching context. Teachers, as guides and mentors, use their educational knowledge to support and assist students in their writing efforts. Based on the ideas of Flower and Hayes (1980) their role can be briefed in

- teachers serve as guides and facilitators in the writing process, providing support, guidance, and resources to help students develop their writing skills.
- provide instruction on writing techniques, strategies, and conventions, helping students develop their writing proficiency.
- mentor and coach students, offering individualized feedback, encouragement, and guidance to support their writing development.
- serve as models of effective writing, demonstrating proper writing practices, organization, style, and mechanics. They share their own writing experiences, challenges, and successes to inspire and motivate students in their writing

it is clear that the teacher's role goes beyond simply sharing information. Instead, it involves creating a supportive environment where students feel encouraged to develop their creative abilities, navigate language challenges, and improve their skills through repeated practice. Murray (1972) argues that writing is intrinsically dialogic, emphasizing the collaborative aspect of the writing process.

Therefore, in the collaborative environment of the writing classroom, students and teachers work together to create a culture of excellent writing. This involves combining linguistic fluency, rhetorical skill, and creative expression to empower learners in their pursuit of effective communication and academic achievement in EFL settings.

## **1-6. Types of Writing in EFL Classes**

Writing in many forms plays a crucial role in language learning and expression in English as a Foreign Language (EFL) lessons. Paraphrasing the words of renowned linguist (Stephen Krashen), “*Writing is an essential skill that not only reflects one’s language proficiency but also facilitates its development.*” This opinion emphasizes the importance of developing a variety of writing styles in English as a Foreign Language (EFL) programs.

### **1-6-1. Paragraph writing**

it is commonly regarded as the primary element of composition, as it offers learners a systematic framework for structuring thoughts concisely. As “William Zinsser”, an esteemed writing instructor, aptly noted, “*The most important sentence in any paragraph is the first one. If it doesn’t induce the reader to proceed to the second sentence, your article is dead.*”

Therefore, acquiring expertise in producing cohesive paragraphs provides pupils with the fundamental abilities required for successful communication.

### **1-6-2. Essays**

Essays provide a wider platform for in-depth inquiry and critique. Ralph Waldo Emerson, an influential essayist, stated that the essay is a literary tool that may be used to express nearly anything about nearly any subject. By writing essays, English as a Foreign Language (EFL) learners improve their ability to think critically and express complicated ideas clearly and accurately.

### **1-6-3. Creative writing**

Creative writing distinguished by its imaginative style, fosters language inventiveness and emotional articulation. Neil Gaiman, a renowned writer, praised the merits of invention, asserting, “*The world appears more radiant when you have recently brought into existence something that did not exist before.*” Creative

writing exercises in EFL classrooms promote the expression of students' creativity, leading to a stronger bond with the language and increased confidence in communication.

### **1-6-4. Academic writing**

characterized by its formal tone and strict adherence to disciplinary rules, helps learners develop the skills necessary for scholarly communication in higher education and professional environments. David Crystal, a renowned linguist, defines academic writing as a specific mode of writing that necessitates a well-defined framework, thorough investigation, and exacting terminology. Integrating academic writing into EFL training enables students to actively interact with intricate concepts and contribute significantly to academic discussions. By adopting a comprehensive approach to teaching writing that includes many forms such as paragraph writing, essays, creative writing, and academic writing, English as a Foreign Language (EFL) instructors provide the foundation for developing linguistic skill and cultivating a lasting admiration for written expression in their students.

### **1-7. Learners' Writing Difficulties and AI Solutions**

Students encounter distinct challenges when enrolled in writing classes., mostly because of language, cognitive, and cultural obstacles. Ferris & Hedgcock (2014) highlight the fact that English as a Foreign Language (EFL) students frequently have difficulties in mastering grammar, vocabulary, and punctuation, all of which are essential components for achieving proficiency in writing. The difficulty in language acquisition is intensified by the mental strain of having to handle various elements of writing in a language that is not one's native tongue (Manchón, 2011).

## **1-7-. Common Difficulties**

### **1-7-1. Linguistic Difficulty**

Linguistic challenges in writing can stem from various factors, such as a lack of proficiency in the language being used, a weak grasp of fundamental language principles, or an insufficient vocabulary. Some students find writing particularly difficult because they struggle with grammar, syntax, and idiomatic expressions. Additionally, students who have not been exposed to a broad vocabulary may find it hard to choose the right words to convey their ideas effectively. Furthermore, writing styles and formats can vary across different subjects and disciplines, and not knowing the specific conventions for each can also pose a challenge for students.

### **1-7-2. Grammar Difficulty**

Grammar is a crucial component of writing, and students who face grammar-related issues may struggle to communicate their ideas effectively. Many students may not have received adequate instruction or practice in writing, leading to common grammar problems such as incorrect verb tenses, run-on sentences, comma splices, and sentence fragments. Grammar rules can be complex and difficult to master, and some students may not recognize the importance of grammar in writing, leading to a lack of attention to this aspect. It is essential for learners to focus on grammar while writing, proofread for errors, and revise their work to correct any mistakes. By improving their grammar skills, students can enhance the clarity and proficiency of their writing. Grammar is defined as a branch of linguistic study that deals with word classes, their inflections, and their functions and relations within sentences (Merriam-Webster's, 1971 and 1986).

### **1-7-3. Sentence Structure**

Sentence structure is a key principle for improving learners' writing. However, students often face difficulties in constructing suitable sentence structures. There are numerous techniques they can use to improve their English writing, such as breaking down complex sentences into smaller, simpler ones to make their writing

easier to read and understand. Additionally, using transition words can help make their writing more structured and fluid. Learners should also review the basics of vocabulary.

#### **1-7-4. Coherence and Cohesion**

Coherence and cohesion are essential elements of effective writing. Students may struggle with these aspects for several reasons, including a lack of planning and organization. They may find it challenging to organize their ideas and thoughts logically and coherently. Students with limited vocabulary or language proficiency may have difficulty expressing themselves clearly and creating cohesive writing. Additionally, learners may rush through their writing assignments without taking the time to review and revise their work, leading to writing that lacks coherence and cohesion. They may not be familiar with the conventions of different genres or may not know how to use various organizational structures to create effective writing. Therefore, students should plan and organize their writing before starting, create a clear outline or structure for their ideas, use transitional words and phrases appropriately, and develop their vocabulary and language proficiency through reading, writing, and practicing new words and expressions.

#### **1-7-5. Punctuation and Spelling Mistakes**

Punctuation and spelling mistakes are common writing issues that can affect the clarity and effectiveness of a student's writing. One major cause is a lack of understanding of punctuation rules, leading to incorrect use of commas, quotation marks, periods, and other punctuation marks, making their writing difficult to read and understand. Another reason is weak spelling skills, which many students struggle with due to a lack of practice or understanding of common spelling patterns and rules. This can result in misspellings that distract the reader and reduce the quality of the writing. Teachers play a crucial role in addressing these writing difficulties. By improving their punctuation and spelling skills, students can enhance the clarity of their writing and communicate their ideas more effectively.

### **1-7-6. How can AI solve these difficulties?**

AI tools can significantly aid in overcoming the various writing difficulties mentioned above and faced by learners. For linguistic challenges, AI-powered tools like Grammarly and QuillBot provide real-time feedback, suggest better word choices, and enhance vocabulary, while language learning apps like Duolingo and Babbel offer personalized learning experiences. Grammar difficulties can be addressed with tools like Grammarly, which detect and correct errors, and platforms like Khan Academy that offer adaptive grammar lessons. Sentence structure issues can be improved with AI tools like Wordtune and QuillBot, which help restructure sentences for clarity and readability. For coherence and cohesion, content organization tools like Scrivener and Evernote assist in planning and structuring writing, while readability checkers like Hemingway Editor enhance text flow. Punctuation and spelling mistakes can be corrected with AI-powered spell checkers and punctuation tools, and educational apps like SpellingCity provide personalized practice exercises. These AI tools collectively enhance writing skills, making the process more efficient and effective.

In the next chapter, we will discuss in detail the use of artificial intelligence (AI) to improve EFL students' writing skills. By integrating AI into the learning process, students can receive immediate feedback, which helps them identify and resolve issues in their writing, thereby improving fluency, accuracy, and self-correction. The chapter will explore what AI is, its use in the field of education, and the various AI applications, their impact on writing quality, and the perceptions of both students and teachers towards these technologies, providing a comprehensive understanding of how AI can be leveraged to enhance EFL writing skills.

## **Chapter two**

The use of artificial intelligence in the field of education to  
improve writing

## 2-Artificial Intelligence in Education

*In which we try to explain why we consider artificial intelligence to be a subject most worthy of study, and in which we try to decide what exactly it is, this being a good thing to decide before embarking*

Stuart Russell

### 2-1. Artificial Intelligence: Historical Overview

The history of artificial intelligence (AI) is captivating; it starts with legends and myths and ends with modern innovations. The idea of creating intelligent devices has captured people's imaginations for centuries, even before the mechanical monsters of ancient Greek mythology, such as the metal monster Talos, were introduced. These famous pioneers laid the foundation for the dream of artificial intelligence (AI), which would finally come to pass.

The seeds of modern AI were planted by classical philosophers who attempted to describe the process of human thinking as the mechanical manipulation of symbols. This work culminated in the invention of the programmable digital computer in the 1940s, a machine based on the abstract essence of mathematical reasoning. This device and the ideas behind it inspired a handful of scientists to begin seriously discussing the possibility of building an electronic brain (Pamela McCorduck 2004)

Artificial intelligence is based on the assumption that the process of human thought can be mechanized. The study of mechanical—or “formal”—reasoning has a long history. Chinese, Indian and Greek philosophers all developed structured methods of formal deduction in the first millennium BCE. Their ideas were developed over the centuries by philosophers such as Aristotle (who gave a formal analysis of the syllogism), Euclid (whose *Elements* was a model of formal reasoning), al-Khwārizmī (who developed algebra and gave his name to “algorithm”) and European scholastic philosophers such as William of Ockham and Duns Scotus (Berlinski 2000)

The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. But the journey to understand if machines can truly think began much before that. In Vannevar Bush's seminal work *As We May Think* (Bush45) he proposed a system which amplifies people's own knowledge and understanding. Five years later Alan Turing wrote a paper on the notion of machines being able to simulate human beings and the ability to do intelligent things, such as play Chess (Turing50)

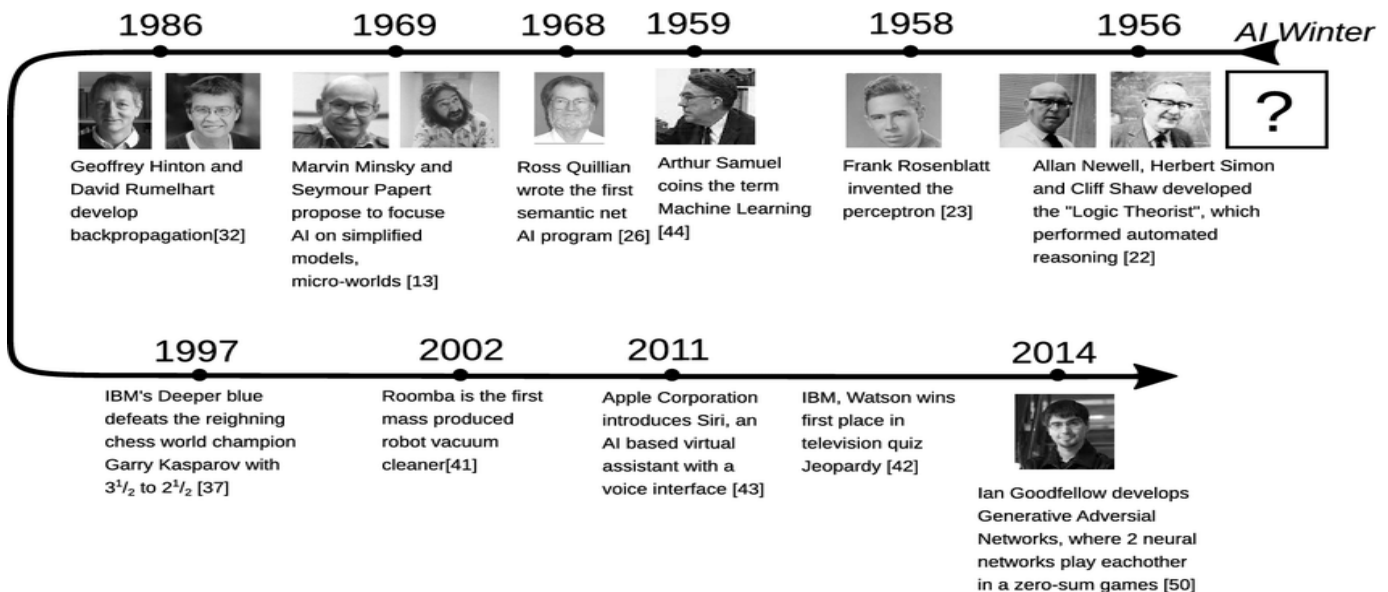
When the term "artificial intelligence" was coined during a workshop at Dartmouth College. The guests, who would later become pioneers in AI research, predicted that within a generation, computers would have intelligence on a level with that of humans and expressed hope for the field's future. Their early discovery that they had greatly misjudged the complexity of the task was the source of the first "AI winter" in the 1970s, when funding and excitement in the field declined. (McCorduck 2004)

The years after the Dartmouth conference were an era of discovery, of sprinting across new ground. The programs that were developed during this time were, to most people, simply "astonishing (Russell & Norvig 2003) computers were solving algebra word problems, proving theorems in geometry and learning to speak English. (Crevier 1993)

The first generation of AI researchers, including H. A. Simon, Allen Newell, and Marvin Minsky, predicted rapid advancements in artificial intelligence. They foresaw computers mastering chess and achieving human-level tasks within decades. Despite challenges, AI experienced a resurgence in the 1980s and accelerated further in the 1990s and 2000s, driven by improved computing power and data access. Notable milestones include ImageNet's creation in 2009 and IBM's Deep Blue defeating chess champion Garry Kasparov in 1997. Since 2010, AI has boomed due to vast data and computing capabilities, with techniques like neural networks revolutionizing fields like robotics and healthcare. AI is transforming sectors like healthcare, finance, and entertainment, fundamentally altering daily life (Simon & Newell).

An important aim of AI research is enabling computers to understand and communicate in natural languages such as English, which is the main focus of the study in our thesis.

The first early achievement in this matter was Daniel Bobrow's program STUDENT, which could solve high school algebra word problems. Semantic nets, which represent concepts like "house" and "door" as nodes and relations between them as links (e.g., "has-a"), were introduced by Ross Quillian. The most successful, albeit controversial, version was Roger Schank's Conceptual Dependency Theory.



Timeline of AI history

## **2-2. The Definition of AI in Education**

In a 2020 review on “AI in Education” by Chen et al., various definitions of AI are explored, highlighting its capacity to perform tasks typically associated with human intelligence. One definition characterizes AI as the ability of machines to adapt to new situations, solve problems, and devise plans. Another perspective describes AI as having the capability to recognize patterns, make decisions, adapt to changes, and learn from experiences, often involving technologies such as machine learning and data mining. These definitions underscore the multifaceted nature of AI and its application in education, with different authors offering diverse perspectives. Our focus is on AI in Educational Resource Systems (AIER), specifically designed to support educational tasks. AIER encompasses technologies tailored for educational purposes, as well as general AI methods, without restricting the definition based on specific technologies.

In the realm of education, one of the primary hurdles is the diversity of learning styles among students. Teachers often struggle to fully grasp each student’s unique learning needs, making it challenging to tailor teaching methods accordingly. This limitation can result in a misalignment between teaching design and students’ actual learning requirements, leading to inefficient use of time, energy, and educational resources. However, artificial intelligence (AI) systems offer a solution by providing personalized learning experiences to each student. By identifying individual learning styles, AI can ensure that students receive instruction in the most effective manner for them. Additionally, AI systems can accurately track each student’s progress, enabling teachers to implement targeted and precise teaching strategies. Currently, AI applications in education primarily encompass image recognition, speech recognition, human-computer interaction, and similar technologies (Deng, 2019).

## 2-3. Impact of COVID-19 Pandemic on Driving AI Research in the Frontier of

### Education

The COVID-19 pandemic, possibly one of the most significant societal disruptors in recent memory, affected over 1.5 billion students worldwide (UNESCO, 2022) and is believed to have had profound implications for education, potentially resulting in setbacks spanning generations (Tadesse and Muluye, 2020, Dorn et al 2021, Spector, 2022). As lockdowns and social distancing measures necessitated a swift shift to fully virtual educational delivery, the pandemic era witnessed a surge in the adoption of video conferencing platforms and social media for knowledge dissemination, alongside an increase in asynchronous learning formats. However, these alternative modes of communication often correlated with diminishing levels of learner engagement and satisfaction (Wester et al., 2021; Hollister et al., 2022). Additionally, practical sessions, labs, and workshops, crucial in certain educational domains, experienced a corresponding decline (Hilburg et al, 2020).

Nevertheless, the pandemic also accelerated the integration of AI-based approaches in education. Initial studies indicate a significant uptick in the utilization of AI-driven e-learning platforms during the pandemic (Pantelimon et al, 2021). Furthermore, the transition to online learning environments naturally led to the collection of more data points from the learning process, which could be leveraged by AI-based methods to evaluate and enhance student engagement while offering personalized feedback (Xie et al, 2020). Online teaching platforms also facilitated the incorporation of web-based content, interactive features, and asynchronous review sessions to enhance student involvement (Kexin et al., 2020; Pantelimon et al., 2021).

Recent studies have explored the role of pandemic-induced remote and hybrid instruction in exacerbating disparities in educational attainment based on race, socioeconomic status, and gender (Halloran et al, 2021; UNESCO, 2021; Goldhaber et al., 2022). The widespread adoption of remote learning highlighted the importance of access to essential infrastructure (electricity, internet connectivity,

and suitable electronic devices) and resources (educational materials, textbooks, software) which pose barriers for economically disadvantaged groups (Muñoz-Najar et al., 2021). Moreover, within similar demographics, unequal distribution of household responsibilities, income-generating activities, and access to technology disproportionately affect students of different genders (UNESCO, 2021).

Additionally, remote learning demands a certain level of technological proficiency from both students and educators, which may be lacking in individuals with learning disabilities. In addressing these challenges, Garg and Sharma (2020) outline various applications of AI in special needs education, focusing on the development of adaptive and inclusive teaching methods. Salas-Pilco et al. (2022) provide a comprehensive overview of the diverse ways AI can support inclusive education while also highlighting the barriers posed by technological, pedagogical, and socio-cultural factors.

## **2-4. The Teacher's Role in Integrating AI in Education**

AI in Education (AIEd) is an emerging field within educational technology, focusing on leveraging technology and algorithms to enhance learning processes and student outcomes. Through AI, educators can gather data on student performance and tailor learning experiences to individual needs. AI facilitates the creation of adaptive learning systems, feedback provision, assessment of learning progress, and enables distance learning.

Implementing AIEd involves two main approaches. Firstly, AI can assume the role of a tutor, taking on tasks traditionally performed by teachers. This includes personalized tutoring through smart technology (Hwang et.al., 2020), which adapts content to each student's needs. Secondly, AI can augment human intelligence, assisting educators in delivering more effective and efficient learning experiences. There are various applications of AI in learning activities aimed at enhancing the overall learning process.

As societal demands evolve, all sectors, including education, must adapt and collaborate to address challenges. Artificial intelligence (AI) serves as a valuable supplementary tool to streamline teachers' tasks. While the necessity of AI in the classroom may be questioned, its clear advantages in enhancing student learning and teacher efficiency warrant consideration. Moreover, as education aims to equip students for the real world, where AI plays a significant role across various industries, integrating AI into the classroom becomes essential. By preparing students to effectively interact with AI, educators ensure they are equipped for future careers where AI is prevalent, thus fostering meaningful and productive engagement with the technology. Failure to do so could leave students ill-prepared for the demands of the workforce

Zawacki-Richter et.al. (2019) present four application areas for AIED in academic support services and institutional and 168 Epigram Vol.20 No. 2 October 2023 administrative services: profiling and prediction, assessment and evaluation, adaptive systems and personalization, and intelligent tutoring systems. Conclusions address the near absence of critical reflection on the challenges and risks of AIED, the tenuous connection to theoretical pedagogical perspectives, and the need for additional research into ethical and educational approaches in the use of AIED in higher education is a growing trend in the learning and teaching arena. AI learning tools are a great way to overcome the challenges faced by teachers and students. They can help improve student performance by providing more relevant feedback, helping them learn faster, increasing their learning retention, and improving students' learning, study, and performance. The following is the application of Artificial Intelligence in education as following (Fahimirad, 2018)

## **2-5. AI Tools for teachers to help improve Writing**

### **2-5-1. Virtual Mentors**

Virtual mentors aid in online learning by facilitating communication between teachers and students, providing materials, practice questions, and assignments, as well as offering feedback on student progress. An example of this is the Blackboard platform, widely used in universities for sharing class materials and enabling student-teacher interaction.

### **2-5-2. Voice Assistant (VA)**

VA technology enables voice-based interaction, allowing students to search for information and receive responses verbally. This assists in independent learning, as students can access information through spoken queries, enhancing comprehension and accessibility.

### **2-5-3. Smart Content**

AI-powered smart content helps users locate and categorize digital materials, such as books and articles, more efficiently. Apps like Smart Content and Cram101 facilitate easier access to relevant educational resources, aiding students in finding information specific to their needs

### **2-5-4. Presentation Translator**

Presentation Translator converts text from one language to another, enabling users to listen to speeches, articles, and publications in their native language. This technology, often reliant on voice input, enhances accessibility for users with language or vision impairments.

### **2-5-5. Global Courses**

Platforms like Udemy, Khan Academy, and Duolingo offer open and free courses with AI-based personalization features. Students can enroll in online courses from around the world, receive recommendations based on their interests, and track their progress.

### **2-5-6. Automatic Assessment**

AI facilitates automatic assessment and question correction for quizzes and examinations conducted online. Teachers can create and administer assessments efficiently, with AI systems adapting to user preferences and providing immediate feedback on student performance.

### **2-5-7. Personalized Learning**

AI analyses students' learning styles and preferences to provide personalized learning experiences. Platforms like Khan Academy and Duolingo offer tailored content suggestions, study schedules, and alternative learning solutions based on user data, enhancing the efficacy of learning processes.

## **2-6. Challenges from Teachers' Perspectives**

The integration of artificial intelligence technology in education presents both challenges and opportunities for teachers' professional roles (Liu & Wang, 2020). While AI serves as a valuable assistant and classroom analyst, enhancing teaching effectiveness and precision, teachers remain essential as designers, decision-makers, and guides in the learning process. Beyond imparting knowledge, teachers play a crucial role in guiding, motivating, and evaluating students' learning journeys, aiming to foster holistic development and equip them with skills relevant to modern society.

Enhancing teachers' attitudes toward integrating AI in English as a Foreign Language (EFL) instruction is crucial, given the varied perspectives observed in existing literature. While some are positive, others,

particularly less-experienced instructors, exhibit conservatism due to difficulties in effectively utilizing AI analytics. To foster AI acceptance among teachers, strategies such as boosting confidence and expanding AI knowledge are recommended. Moreover, there's a need for further research to demonstrate AI's effectiveness in EFL contexts and to provide adequate theoretical and practical training for teachers. Awareness of ethical considerations when employing AI is essential, along with opportunities for interdisciplinary collaboration to support teachers in maximizing AI's pedagogical benefits.

Teachers face systems such as AESs (Automated Essay Scoring) that evaluates the quality of essays by analysing factors such as grammar, usage, mechanics, style, and organization

IVE, and AC in ITSs that streamline teaching tasks by automating administration, assessment, feedback, and data analysis (Baker and Smith, 2019)

Thus, since our study focuses on EFL settings, certain AI applications fulfil dual roles in both teaching and learning. For example, AESs, NMT tools, and ITSs can function as monitoring and tutoring aids in EFL instruction, while IVEs enable the creation of interactive virtual reality environments to support EFL learning. (Groves and Mundt, 2015; Abu Ghali et al., 2018; Gao, 2021; Koh, 2022)

## **2-7. AI Tools for Students to Improve Writing**

AI applications in education are transforming the learning landscape, offering personalized, adaptive, and intelligent solutions to enhance student outcomes. In the specific context of EFL writing, AI-powered tools and platforms provide learners with valuable support, feedback, and resources to develop their writing skills effectively. As AI technologies continue to advance, we can expect to see even more innovative applications that revolutionize the way EFL learners acquire and master writing proficiency.

### **2-7-1. AI language models like ChatGPT**

The advent of ChatGPT (Generative Pre-trained Transformer) by OpenAI represents a significant innovation, allowing digital tools to undertake tasks typically associated with human intelligence. Its prototype release in November 2022 showcased its capabilities in handling numbers, formulas, text, and programming code, offering responses to diverse inquiries. ChatGPT, described as one of the most potent AI models, is employed by writers through platforms like Chat OpenAI (ChatGPT, <https://chat.openai.com>), with its versatility potentially streamlining tasks and enhancing productivity across various sectors, including education.

In specific educational contexts, Zulfikasari et al. (2024) explore ChatGPT's potential to enhance language learning experiences by simulating human interactions. Similarly, Kaswar et al. (2023) develop a Teaching-Learning support model integrating ChatGPT technology in universities.

### **2-7-2. Grammarly**

Fahmi & Rachmijati (2021) highlight Grammarly as an online tool extensively used for English writing and grammar verification, offering several benefits such as comprehensive grammar checking, plagiarism detection, and proofreading. This tool aids students in understanding and rectifying writing errors, thereby facilitating more effective learning (Fitria 2021) emphasizes the advantages of Grammarly for millennial students, enhancing classroom innovation and relevance.

Ghufron & Rosyida (2018) assert Grammarly's position among the top grammar checkers, particularly beneficial for students seeking to improve their English writing and vocabulary while avoiding plagiarism. Grammarly's application in classrooms to rectify writing errors is growing, driven by its popularity among educators and students, especially those studying English (Ambarwati, 2021).

Octaberlina (2023) compares Grammarly to a booster for high school students' English proficiency, underscoring its role in language acquisition. Grammarly offers both direct and indirect feedback, aiding

students in understanding grammar rules and fixing mistakes efficiently. Additionally, it saves time by correcting typos and offers many free features, boosting users' writing confidence.

Despite its benefits, Grammarly has limitations. Users must carefully review each suggestion as they may not always align with the intended meaning. Furthermore, Grammarly lacks the ability to assess the coherence between sentences and requires internet connectivity for use, impacting its accessibility and usability (Oktaviani et al., 2022).

In conclusion, Grammarly offers advantages in fast and accurate correction of writing errors, benefiting students' learning process. However, it has limitations, such as its inability to identify tense usage and the requirement for payment to access premium features.

### **2-7-3. QuillBot**

an alternative language teaching method, integrates AI-based language detection with summarizing and paraphrasing tools, making it a widely utilized free paraphrasing program (Dale, 2020). Through various deep learning and natural language analysis techniques, QuillBot employs AI to suggest paraphrases, offering users the ability to generate new sentences by automatically adjusting words (Fitria, 2021b). Users can simply input text and select the paraphrase option to utilize QuillBot's paraphrasing tool, which is particularly useful for writers aiming to avoid plagiarism and create authentic content (Amanda et al., 2023).

QuillBot offers several characteristics beneficial for users, including Standard Mode for slight alterations to text, Fluency Mode for applying appropriate syntax, Formal Approach for formalizing text formatting, Easy Mode for simplifying text, Creative Mode for extensive phrasing changes, Expand Mode for adding words, and Reduce Mode for removing text while maintaining meaning (Amyatun & Kholis, 2023).

Regarding its impact on academic writing, QuillBot positively enhances students' writing by providing access to academic vocabulary and aiding in paraphrasing, formality, objectivity, complexity, and hedging (Jaladara et al., 2023).

In conclusion, QuillBot AI has the potential to significantly enhance students' writing abilities, particularly when used alongside instructional materials. It offers various tools to improve writing quality, including word suggestions, sentence restructuring, and paraphrasing capabilities, enabling students to proofread their work effectively and avoid plagiarism (Amyatun & Kholis, 2023).

## **2-8. AI Ethics and Regulation in the Field of Education**

The ethical and regulatory aspects of AI in education are of utmost importance and demand meticulous deliberation, given the growing integration of AI technology in learning settings. In order to ensure the proper development and use of AI technologies in educational contexts, it is imperative to create explicit standards and principles.

AI projects that are poorly conceived and based on flawed, insufficient, or biased data might result in unforeseen and perhaps detrimental outcomes for students. Researchers and practitioners in Artificial Intelligence in Education (AIED) face a myriad of challenges despite its potential to revolutionize education. AIED, being highly dependent on technology and interdisciplinary, presents significant hurdles at both global and individual levels. UNESCO (2019) outlined six challenges for sustainable development in AIED, encompassing areas such as public policy, equity, and ethical data practices. At an individual level, issues range from societal biases to ethical concerns regarding privacy and data processing (Holmes et al., 2021). Concerns extend to emerging issues like the commercialization of education and the digital divide exacerbated by the COVID-19 pandemic (Reiss, 2021).

Ethical considerations in AIED are paramount, necessitating a nuanced approach to distinguish between ethical actions and ethical behaviour (Holmes et al., 2021). A wealth of literature explores various ethical themes in AIED, including data liability, privacy breaches, bias, and accountability (Zawacki-Richter et al., 2019; Holstein et al., 2019). Discussions also touch upon broader issues such as surveillance, learner privacy, and data management (Luckin, 2017; Sacharidis et al., 2020).

While efforts have been made to establish ethical frameworks for AI, the contextual nature of ethical and privacy issues in education suggests a need for tailored approaches (Ifenthaler & Schumacher, 2016). Recognizing the sociotechnical context of educational technology is crucial for the ethical design and implementation of AIED (Kitto & Knight, 2019). Incorporating perspectives from various stakeholders and international organizations can inform comprehensive guidelines for ethical AIED development (Ashok et al., 2022), facilitating further advancements in the field.

The primary objective of the IEAIED is to guarantee that AI in education does not favour some elements of learning while disregarding others, as this might disrupt the learning process and hinder human growth.

Asimov's Three Laws of Robotics, which stipulate that robot are prohibited from causing harm to people, are obligated to follow human commands unless they contradict the first law, and are required to safeguard their own existence as long as it does not contradict the first two laws, establish a basis for ethical considerations in AI within the field of education. The concept of "primum non nocere" from the Hippocratic Oath should be extended to the utilization of AI in all educational setting

## **2-9. Recommendations**

The future prospects for AI applications in improving writing skills for English as a Foreign Language (EFL) learners are highly promising and stimulating. With the rapid advancement of AI technology, we anticipate the emergence of increasingly complex and efficient solutions designed expressly for the requirements of EFL students.

An important aspect of development will be on delivering individualized feedback and coaching. AI writing assistants possess the capability to examine a student's work in real-time, accurately identifying their strengths, flaws, and places for progress by considering their specific skill level, common errors, and learning objectives. The applications will provide customized recommendations, revisions, and elucidations to assist each learner in advancing at their individualized speed.

Another significant advantage will be the capacity for AI to provide learning materials that are more genuine and contextually appropriate. AI systems will have the capability to generate reading passages, essay questions, and grammar exercises that are captivating, culturally suitable, and tailored to a student's preferences, instead of depending on generic illustrations. This will enhance motivation and render the learning process more significant and efficient.

Artificial intelligence (AI) writing tools will assist English as a Foreign Language (EFL) learners in developing specialized vocabulary and becoming proficient in various writing styles. The applications will utilize extensive databases of academic papers, corporate reports, creative writing pieces, and other sources to discern the language patterns, structures, and terminology necessary for achieving success in different fields. Students will be provided with specific suggestions and real-life examples to assist them in writing smoothly and effectively for any given objective.

Ultimately, AI will provide enhanced and engaging writing experiences. Intelligent tutoring systems and chatbots will work as constantly accessible writing mentors, offering students limitless chances to practice, get criticism, and participate in guided self-improvement. The use of gamification aspects and virtual writing communities will enhance the process by making it enjoyable, interactive, and gratifying.

Undoubtedly, the effective incorporation of AI writing tools will need careful planning of instructional design, comprehensive training of teachers, and continuous study. However, the collaboration between educators and developers to utilize the capabilities of AI has the potential to greatly revolutionize EFL writing teaching. Students will gain advantages from a streamlined, productive, and pleasurable journey towards developing confidence and proficiency as writers in their second language

## **Chapter three**

### Data analysis and findings

### **3. Research Methodology**

Since the integration of Artificial Intelligence (AI) into English learning has caught the eye for its potential to shake up how we develop writing skills. This study dives into how AI, and the platforms we mentioned earlier, is changing the game in EFL writing. Using AI in EFL writing has shown promise in helping us finish tasks better. Tools like Grammarly and Chatgpt can really boost our ability to complete writing assignments. By giving us personalized prompts and feedback, it helps us do better overall in our writing.

This chapter aims to evaluate the effectiveness of artificial intelligence (AI) chatbots and language models, including Grammarly, Chatgpt and Quilbot in enhancing writing skills

The research investigates the impact of AI tools on writing instruction. Quantitative data, gathered through a questionnaire serves as a data collection method by presenting respondents with questions or written statements to answer

to conduct this study, we used quantitative research methods, its duration was approximately 3 weeks of data collection from EFL student the study took place in” Abass Laghrour” university, year 2024

#### **Participants of the Study:**

The participants of this study included 3<sup>rd</sup> year and master 1 and 2 degrees during the second semester, 4 classes were used to answer a prepared survey (questionnaire)

### 3. 1. Description (Questionnaire)

#### **Background of the Study:**

Since the integration of Artificial Intelligence (AI) into English learning has caught the eye for its potential to shake up how we develop writing skills. This study dives into how AI, and the platforms we mentioned earlier, is changing the game in EFL writing. Using AI in EFL writing has shown promise in helping us finish tasks better, this research provides a comprehensive understanding of AI's role in the educational landscape. By examining familiarity, confidence, accessibility, individual learning needs, and overall impact on writing instruction

This chapter aims to evaluate the effectiveness of artificial intelligence (AI) chatbots and language models, including Grammarly, chatgpt , quillbot in enhancing writing skills. Employing a mixed-method design, incorporating both quantitative and qualitative approaches

the research investigates the impact of AI tools on writing instruction. Quantitative data, gathered through A questionnaire which serves as a data collection method by presenting respondents with questions or written statements to answer

to conduct this study, we used quantitative and qualitative research methods, its duration was approximately 3 weeks of data collection from EFL student the study took place in” Abass Laghrour” university, year 2024

#### **Participants of the Study:**

The participants of this study were 3<sup>rd</sup> year students during the second semester, 4 classes were used to answer a prepared questionnaire about the use of AI in helping to improve writing an

experiment that contained two comparison tests of the regular used methods for writing and AI tools.

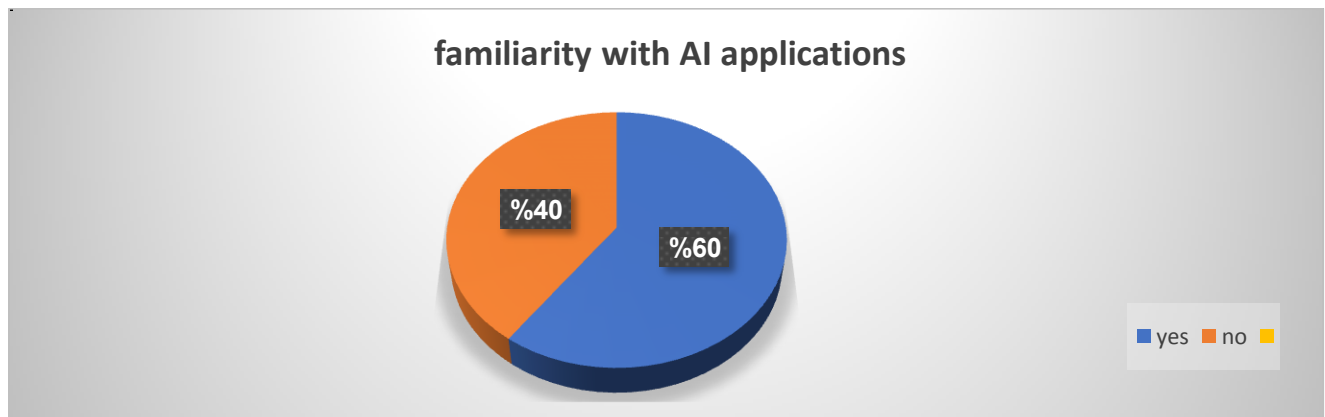
### 3. 2. Statistical Analysis of AI Tool use for English Writing Skill

**The questionnaire was handed to over 50 EFL students**

#### ➤ **Familiarity with AI**

##### **1. Are you familiar with the various types of AI applications available for improving English writing skills?**

This question assesses the awareness level of EFL learners about AI tools. According to the sources, AI tools like Grammarly, Quillbot, Grammary and ChatGPT are commonly used in EFL contexts to enhance writing skills by providing instant feedback and suggestions for improvement

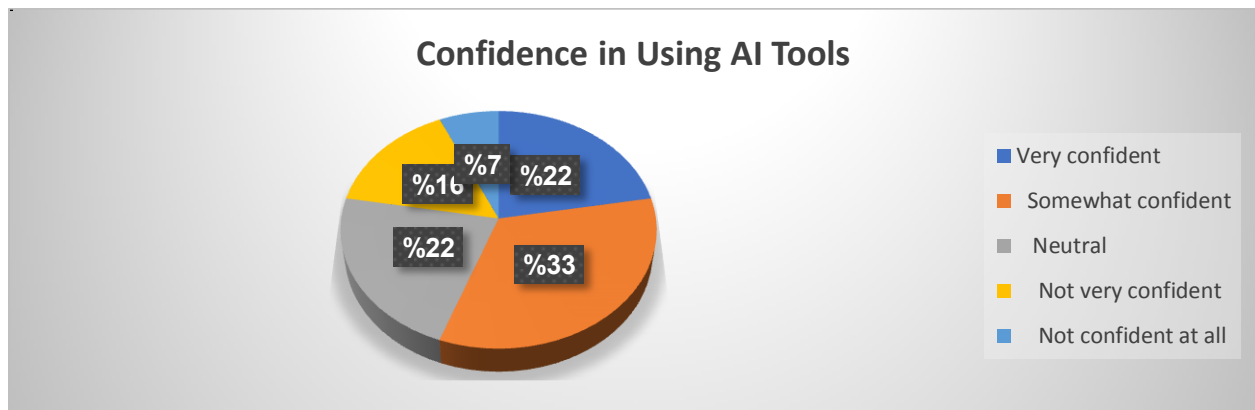


#### ➤ **Confidence in using AI tool**

##### **2. How confident are you in using AI tools for writing tasks in English?**

The purpose of this question is to measure the confidence levels of EFL learners in using AI tools for English writing tasks. By understanding how confident learners feel,

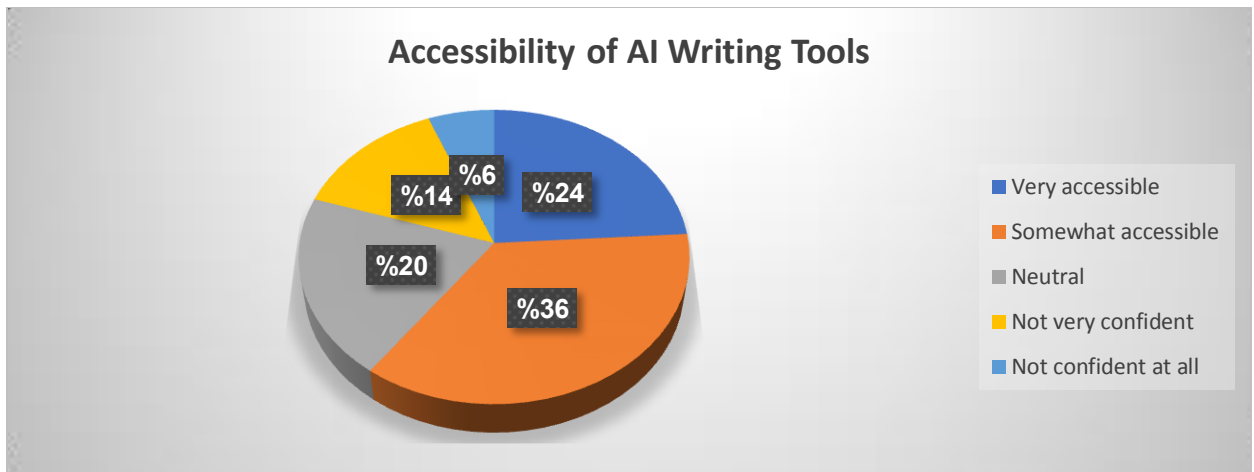
the research aims to evaluate the usability, accessibility, and perceived effectiveness of AI writing tools. This information can identify areas where further training or improvements may be needed to increase learners' comfort and proficiency with these tools, ultimately enhancing their integration into language learning.



➤ **Accessibility of AI Writing Tools**

**3. How would you rate the accessibility of AI writing tools for EFL learners, considering factors such as cost, ease of use, and availability of resources?**

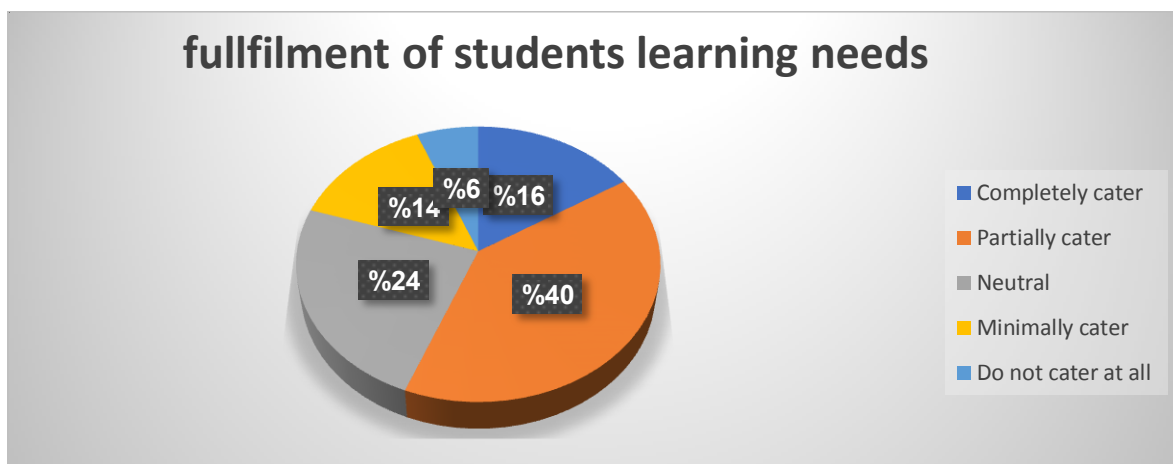
Accessibility is a crucial factor. Many AI tools offer free versions with basic features, making them accessible to a wide range of learners. However, advanced features often require subscriptions, which might limit accessibility for some students. The purpose of this question was to evaluate the accessibility of AI writing tools for EFL learners by considering various factors such as cost, ease of use, and availability of resources.



➤ **Fulfilment of students learning needs**

**4. To what extent do you think AI writing tools cater to the individual learning needs and preferences of EFL learners?**

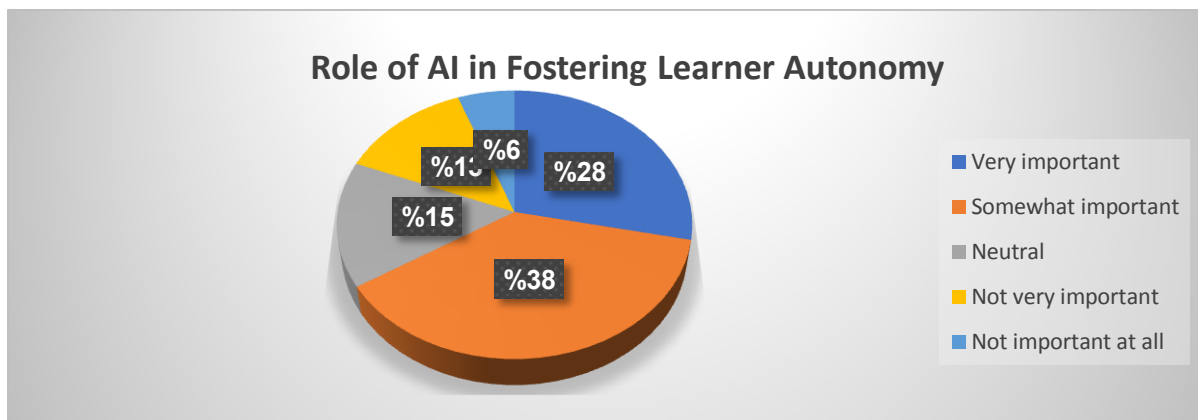
The purpose of this question was to evaluate the effectiveness and adaptability of AI writing tools in addressing the unique learning requirements and preferences of English as a Foreign Language (EFL) learners. By understanding the extent to which these tools meet with individuals needs, the research aims to identify potential benefits and limitations of AI-assisted learning in EFL education.



➤ **Role in Fostering Learner Autonomy**

**5. How do you perceive the role of AI in fostering learner autonomy and self-directed learning in English writing practice?**

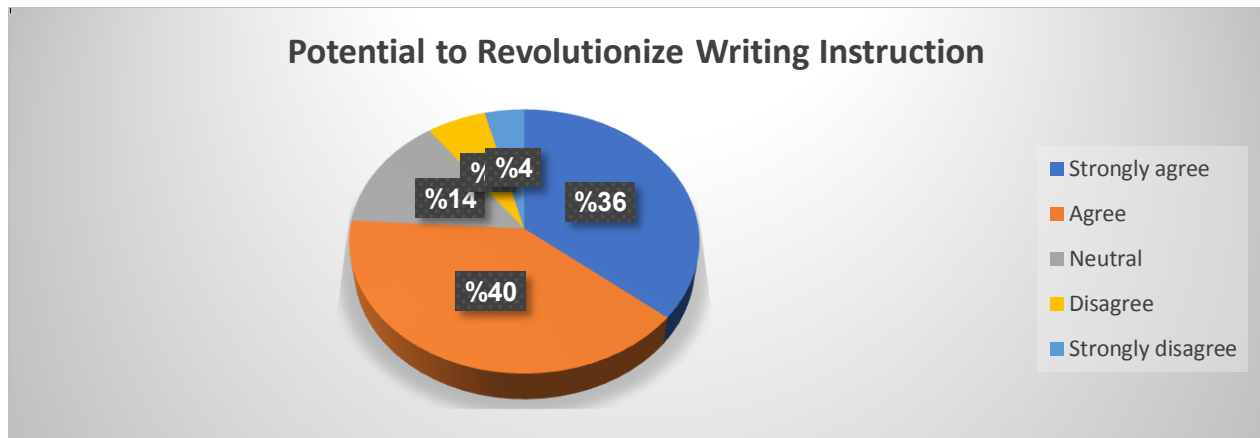
The purpose of this question was to investigate the perceived impact of AI on enhancing learner autonomy and encouraging self-directed learning among EFL students in the context of English writing. By understanding how learners and educators view AI's role in fostering independent learning



➤ **Potential to revolutionize writing Instruction**

**6. Do you believe that AI applications have the potential to revolutionize the way EFL learners approach writing instruction and practice?**

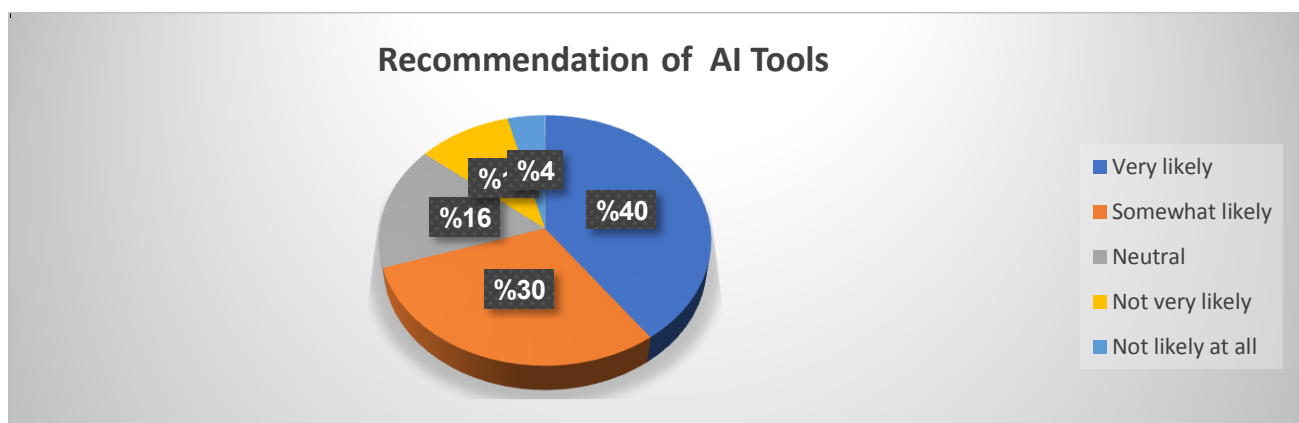
The purpose of this question was to explore beliefs about the transformative potential of AI applications in EFL writing instruction and practice. By assessing perceptions of AI's capability to revolutionize traditional methods, the research aims to understand the anticipated impact and innovation AI could bring to language education.



➤ **Recommendation of AI Tools**

**7. How likely are you to recommend AI writing tools to other EFL learners for improving English writing skills?**

The purpose of this question was to measure the willingness of EFL learners to endorse AI writing tools to their peers based on their own experiences. This question aims to evaluate user satisfaction, perceived effectiveness, and the overall reputation of AI writing tools in enhancing English writing skills.



| The question                                         | The percentage of the collected answers |                                      |                          |                                       |                                       |
|------------------------------------------------------|-----------------------------------------|--------------------------------------|--------------------------|---------------------------------------|---------------------------------------|
| Familiarity with AI Applications                     | <b>Yes<br/>(60%)</b>                    | <b>No<br/>(40%)</b>                  |                          |                                       |                                       |
| Confidence in Using AI Tools                         | <b>Very confident<br/>(20%)</b>         | <b>Somewhat confident<br/>(30%)</b>  | <b>Neutral<br/>(20%)</b> | <b>Not very confident<br/>(30%)</b>   | <b>Not confident at all<br/>(10%)</b> |
| Accessibility of AI Writing Tools                    | <b>Very accessible<br/>(24%)</b>        | <b>Somewhat accessible<br/>(36%)</b> | <b>Neutral<br/>(20%)</b> | <b>Not very accessible:<br/>(14%)</b> | <b>Not accessible at all<br/>(6%)</b> |
| Fulfillment of students Learning Needs               | <b>Completely cater<br/>(16%)</b>       | <b>Partially cater<br/>(40%)</b>     | <b>Neutral<br/>(24%)</b> | <b>Minimally cater<br/>(14%)</b>      | <b>Do not cater at all<br/>(6%)</b>   |
| Role of AI in Fostering Learner Autonomy             | <b>Very important<br/>(30%)</b>         | <b>Somewhat important<br/>(40%)</b>  | <b>Neutral<br/>(16%)</b> | <b>Not very important<br/>(10%)</b>   | <b>Not important at all<br/>(4%)</b>  |
| Potential of AI to Revolutionize Writing Instruction | <b>Strongly agree<br/>(36%)</b>         | <b>Agree<br/>(40%)</b>               | <b>Neutral<br/>(14%)</b> | <b>Disagree<br/>(6%)</b>              | <b>Strongly disagree<br/>(4%)</b>     |
| Recommendation of AI Tools                           | <b>Very likely<br/>(40%)</b>            | <b>Somewhat likely<br/>(30%)</b>     | <b>Neutral<br/>(16%)</b> | <b>Not very likely<br/>(10%)</b>      | <b>Not likely at all<br/>(4%)</b>     |

### **Average Percentage**

$$\text{Average Percentage} = \frac{70\% + 76\% + 70\%}{3} = 72\% \quad \text{Average Percentage} = \frac{370\% + 76\% + 70\%}{3}$$

$$\% = 72\%$$

Therefore, approximately 72% of the students view the role of AI positively in enhancing EFL students' writing skills.

## Discussion

The questionnaire findings provide valuable insights into the potential of AI tools in enhancing English writing skills among EFL students. Here, we discuss the implications of these findings across several key areas:

### 1. Familiarity and Confidence

The fact that 60% of students are familiar with AI applications is a promising indicator of the readiness of the student population to integrate AI tools into their writing instruction. Familiarity with technology is a crucial first step towards effective adoption and utilization. However, the varying levels of confidence among students highlight a need for targeted training and support. Confidence in using AI tools can significantly impact their effectiveness. Therefore, educational institutions should focus on providing comprehensive training sessions to boost confidence, especially among those who are less assured.

### 2. Accessibility

The finding that 60% of students find AI writing tools very or somewhat accessible is encouraging, suggesting that logistical barriers are minimal for the majority. However, the notable minority who find these tools less accessible points to areas where improvements are needed. This could involve ensuring that all students have access to necessary hardware and software, as well as addressing any issues related to internet connectivity. Institutions should strive to create an inclusive environment where all students, regardless of their socioeconomic background, have equitable access to these educational resources.

### 3. Fulfillment of Students' Learning Needs

With 56% of students feeling that AI tools at least partially meet their learning needs, there is clear evidence of the potential for AI to provide personalized learning experiences. However, this also indicates that nearly half of the students do not feel fully catered to. This gap underscores the necessity for further development of AI tools to enhance their customization capabilities. AI developers should focus on creating more adaptive learning environments that can tailor feedback and suggestions to the individual needs and learning styles of students. This

would involve integrating more sophisticated algorithms that can analyze and respond to the unique challenges faced by each student.

#### **4. Impact on Learner Autonomy and Writing Instruction**

A significant majority of students (70%) believe that AI fosters learner autonomy, suggesting that these tools empower students to take more control over their learning processes. This is a positive indicator of the role AI can play in promoting independent learning. Additionally, the strong belief (76%) in AI's potential to revolutionize writing instruction reflects broad support for integrating AI technologies into educational strategies. This enthusiasm could be harnessed to drive initiatives aimed at embedding AI tools more deeply into the curriculum, thereby transforming traditional teaching methods and enhancing overall instructional quality.

#### **5. Recommendation of AI Tools**

The high likelihood (70%) of students recommending AI tools underscores their perceived effectiveness and utility. This positive outlook is critical for the broader adoption and acceptance of AI technologies in educational settings. Peer recommendations can significantly influence the uptake of new technologies. Therefore, leveraging this positive perception through testimonials, case studies, and success stories can help in advocating for the integration of AI tools in more classrooms.

#### **Conclusion**

The questionnaire findings collectively suggest that AI tools are generally viewed as effective in enhancing English writing skills among students. High levels of familiarity, confidence, accessibility, and perceived impact on learner autonomy and writing instruction indicate that AI technologies have the potential to significantly improve writing education.

## The experiment

This experiment will provide insights into how AI tools and classical methods affect the writing abilities of EFL students. The findings can help educators understand the potential benefits and limitations of integrating AI tools into EFL writing instruction.

The writing assessment rubric evaluated students' writing skills based on their completed assignments. This rubric encompassed various aspects, including Grammar and Mechanics, Coherence and Cohesion, Argument Quality, and Vocabulary

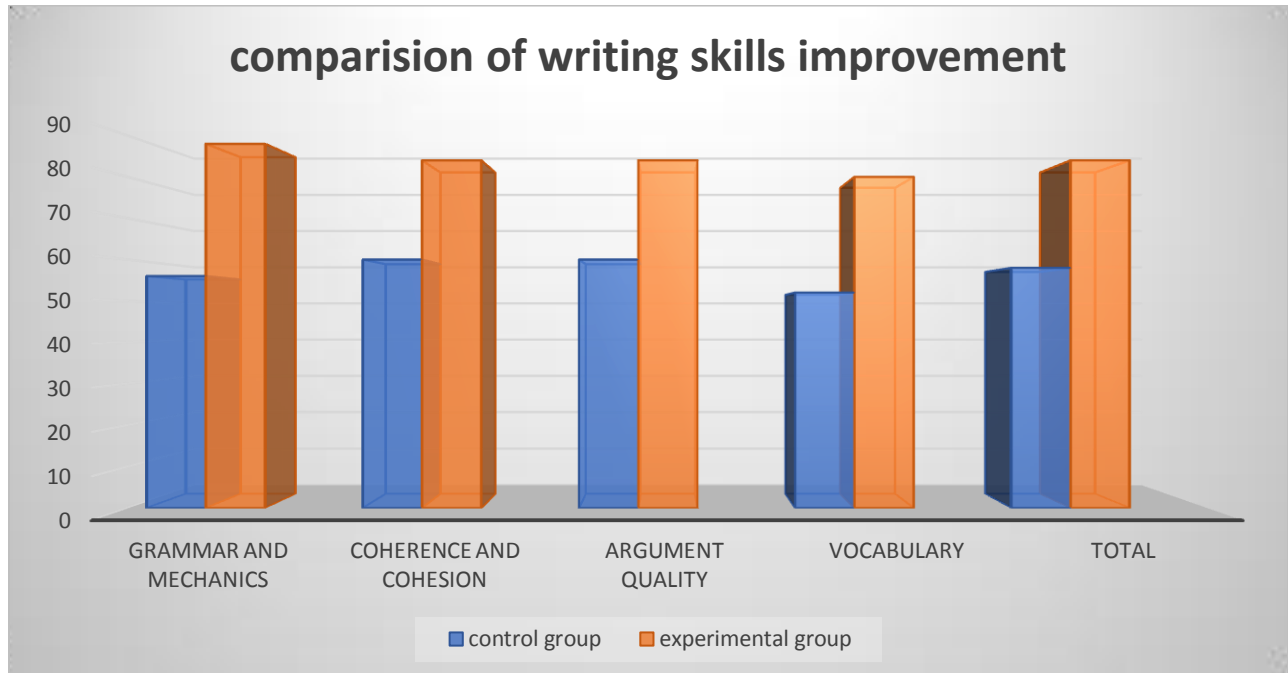
| <b>Criterion</b>              | <b>1 - Poor</b>                                    | <b>2 – Fair</b>                                   | <b>3 - Good</b>                              | <b>4 - Very Good</b>                    | <b>5 - Excellent</b>                                    |
|-------------------------------|----------------------------------------------------|---------------------------------------------------|----------------------------------------------|-----------------------------------------|---------------------------------------------------------|
| <b>Grammar and Mechanics</b>  | Frequent grammar, punctuation, and spelling errors | Several errors that distract the reader           | Some errors but not distracting              | Few minor errors                        | No errors, exemplary mechanics                          |
| <b>Coherence and Cohesion</b> | Ideas are confusing, no logical flow               | Limited logical flow, hard to follow              | Logical flow with some issues                | Mostly logical and easy to follow       | Clear and logical flow, excellent use of transitions    |
| <b>Argument Quality</b>       | Weak or unclear thesis, poor argument development  | Thesis present but weak, underdeveloped arguments | Clear thesis, adequately developed arguments | Strong thesis, well-developed arguments | Exceptional thesis and argument development, persuasive |
| <b>Vocabulary</b>             | Limited and repetitive vocabulary                  | Basic vocabulary, some variety                    | Appropriate vocabulary, some variety         | Good variety and appropriate vocabulary | Rich and varied vocabulary, highly appropriate          |

**Control Group (Classical Writing Methods)**

| <b>Student</b> | <b>Grammar and Mechanics (5)</b> | <b>Coherence and Cohesion (5)</b> | <b>Argument Quality (5)</b> | <b>Vocabulary (5)</b> | <b>Total (20)</b> |
|----------------|----------------------------------|-----------------------------------|-----------------------------|-----------------------|-------------------|
| 1              | 3                                | 3                                 | 3                           | 3                     | 12                |
| 2              | 2                                | 2                                 | 2                           | 2                     | 8                 |
| 3              | 4                                | 4                                 | 4                           | 3                     | 14                |
| 4              | 3                                | 3                                 | 3                           | 3                     | 13                |
| 5              | 2                                | 3                                 | 3                           | 2                     | 10                |
| <b>Average</b> | <b>2.8</b>                       | <b>3.0</b>                        | <b>3.0</b>                  | <b>2.6</b>            | <b>11.6</b>       |

**Experimental Group (AI-Assisted Writing Tools)**

| <b>Student</b> | <b>Grammar and Mechanics (5)</b> | <b>Coherence and Cohesion (5)</b> | <b>Argument Quality (5)</b> | <b>Vocabulary (5)</b> | <b>Total (20)</b> |
|----------------|----------------------------------|-----------------------------------|-----------------------------|-----------------------|-------------------|
| 1              | 5                                | 4                                 | 4                           | 4                     | 17                |
| 2              | 4                                | 4                                 | 4                           | 4                     | 16                |
| 3              | 5                                | 5                                 | 5                           | 5                     | 20                |
| 4              | 4                                | 4                                 | 4                           | 4                     | 15                |
| 5              | 4                                | 4                                 | 4                           | 4                     | 16                |
| <b>Average</b> | <b>4.4</b>                       | <b>4.2</b>                        | <b>4.2</b>                  | <b>4.0</b>            | <b>16.8</b>       |



## Discussion

The comparative analysis of the effectiveness of classical writing teaching methods and AI-assisted writing tools provides insightful data on the impact of AI technologies on EFL students' writing skills. Here, we discuss the implications of these results across the key evaluated criteria:

### 1. Grammar and Mechanics

The experimental group scored an average of 4.4, significantly higher than the control group's average of 2.8. This substantial difference suggests that AI-assisted tools are highly effective in helping students identify and correct grammatical errors. AI writing tools often include advanced grammar checkers that can detect and suggest corrections for a wide range of errors, including punctuation, spelling, and syntactical issues. This immediate feedback allows students to learn from their mistakes and improve their grammatical accuracy over time. The higher scores in the experimental group indicate that these tools not only correct errors but also help students understand and internalize grammatical rules.

## **2. Coherence and Cohesion**

The average score for coherence and cohesion was 4.2 for the experimental group, compared to 3.0 for the control group. This suggests that AI tools provide better structural guidance and aid in the logical flow of essays. AI writing tools often include features that help organize paragraphs, suggest appropriate transitions, and ensure a logical progression of ideas. These tools can analyze the overall structure of an essay and offer recommendations to enhance clarity and flow. The higher scores in the experimental group indicate that students benefited from these features, resulting in essays that were more coherent and cohesive.

## **3. Argument Quality**

The average score for argument quality was 4.2 in the experimental group, while the control group scored 3.0. This difference indicates that AI tools likely assisted students in developing clearer and stronger thesis statements and arguments. AI writing tools often provide prompts and suggestions for developing arguments, backing up claims with evidence, and ensuring that the thesis statement is clear and well-supported throughout the essay. The higher scores in the experimental group suggest that these tools helped students construct more compelling and logically sound arguments, enhancing the overall quality of their essays.

## **4. Vocabulary**

The experimental group scored an average of 4.0 in vocabulary, compared to 2.6 for the control group. This significant difference indicates that AI tools may have offered suggestions for more varied and appropriate vocabulary. Many AI writing tools include features that suggest synonyms, highlight overused words, and recommend more precise or sophisticated vocabulary. These features help students diversify their word choice and improve the overall lexical richness of their writing. The higher scores in the experimental group suggest that students were able to enhance their vocabulary usage with the help of AI tools.

## **Conclusion**

The results clearly indicate that AI-assisted writing tools were more effective in improving the writing skills of EFL students across all evaluated criteria—grammar and mechanics, coherence

and cohesion, argument quality, and vocabulary. This suggests that integrating AI tools into the writing process can significantly enhance the quality of student essays.

## **Recommendation:**

### **1. Enhance Accessibility and Infrastructure**

**Investment in Technology Infrastructure:** Educational institutions should invest in reliable technology infrastructure to ensure that all students have access to AI writing tools. This includes providing necessary hardware, software, and internet connectivity.

**Affordable Access:** Develop policies to make AI tools more affordable or provide subsidies for students who may not have the financial means to access these tools independently.

### **2. Comprehensive Training Programs**

**Teacher Training:** Implement comprehensive training programs for teachers to effectively integrate AI tools into their writing instruction. Teachers should be equipped with the knowledge to use these tools to complement traditional teaching methods.

**Student Workshops:** Conduct regular workshops and tutorials for students to familiarize them with AI writing tools, focusing on maximizing their potential and understanding their features.

### **3. Continuous Development and Customization of AI Tools**

**Personalization Features:** Encourage the development of AI tools that offer personalized feedback and cater to the diverse learning needs of students. Customizable settings can help address individual learning styles and preferences.

**Regular Updates:** Collaborate with AI tool developers to ensure that the tools are regularly updated based on feedback from educators and students. Updates should aim to improve usability, functionality, and the accuracy of writing assistance.

#### 4. Integration into Curriculum

**Blended Learning Approach:** Integrate AI writing tools into the existing curriculum to complement traditional teaching methods. A blended approach can leverage the strengths of both classical and AI-assisted writing instruction.

**Assessment and Feedback:** Use AI tools to provide additional layers of assessment and feedback on student writing. This can help students continuously improve their writing skills through immediate and constructive feedback.

#### 5. Research and Evaluation

**Ongoing Research:** Conduct ongoing research to evaluate the effectiveness of AI writing tools in diverse educational contexts. Research should focus on long-term impacts on writing skills and overall academic performance.

**Feedback Mechanisms:** Establish mechanisms for continuous feedback from both students and educators to identify areas for improvement in AI tools and teaching practices.

#### 6. Addressing Ethical and Accessibility Concerns

**Ethical Use Policies:** Develop and enforce policies to ensure the ethical use of AI tools. This includes addressing concerns about data privacy, academic integrity, and the potential for over-reliance on technology.

**Inclusive Design:** Ensure that AI writing tools are designed to be inclusive and accessible to students with disabilities. This includes compatibility with assistive technologies and adherence to accessibility standards.

## **7. Encouraging Autonomy and Critical Thinking**

**Promote Autonomy:** Encourage students to use AI tools as a means to develop their writing autonomy and critical thinking skills. Emphasize the importance of actively engaging with the feedback provided by AI tools rather than passively accepting suggestions.

**Balanced Approach:** Teach students to balance the use of AI tools with traditional writing practices to maintain and enhance their foundational writing skills.

By implementing these recommendations, educational institutions can maximize the potential of AI tools in enhancing the writing skills of EFL students, leading to improved academic outcomes and greater learner autonomy.

## General conclusion

The integration of Artificial Intelligence (AI) into educational methodologies, particularly its application in enhancing English writing skills for learners of English as a Foreign Language (EFL), heralds a paradigmatic transformation in writing pedagogy. The dynamic evolution of writing instructional strategies, transitioning from traditional product-oriented approaches to more student-centric, process-driven methodologies, harmonizes seamlessly with the capabilities of AI to furnish personalized and adaptive learning experiences. By harnessing AI-powered tools and techniques, EFL students stand to gain from tailored feedback mechanisms, access to contextually relevant learning materials, and accelerated development of specialized vocabulary, thereby fostering a comprehensive and efficient learning trajectory.

The advent of the COVID-19 pandemic catalyzed a rapid adoption of AI in education, precipitating a seismic shift in instructional modalities. The proactive involvement of AI in alleviating the challenges posed by remote learning environments underscores its pivotal role in ensuring educational continuity and inclusivity. Moreover, the pandemic-induced transformation underscored the imperative of equitable access to high-quality educational resources and the critical importance of leveraging AI to bridge the digital divide, thereby ensuring that learners from diverse socio-economic backgrounds are empowered to excel in an increasingly digitized educational milieu.

However, the seamless integration of AI into writing instruction encounters hurdles. Ethical considerations, such as data privacy, algorithmic biases, and the equitable dissemination of AI-enabled resources, demand meticulous deliberation and robust regulatory frameworks to safeguard the integrity and inclusivity of educational practices. Furthermore, the efficacy of AI in augmenting writing skills hinges upon the provision of comprehensive teacher training

initiatives to equip educators with the requisite skills and competencies to leverage AI tools effectively within their instructional practices.

In light of these challenges, it is imperative to underscore the indispensable role of ongoing research and development endeavors aimed at refining AI tools to cater to the diverse and evolving needs of EFL learners. Additionally, collaborative initiatives between educators, policymakers, and technology developers are indispensable in fostering a synergistic ecosystem wherein AI complements, rather than supplants, human expertise in facilitating meaningful learning experiences. By harnessing the transformative potential of AI, educators can precipitate a paradigmatic shift in writing instruction, thereby empowering EFL learners to cultivate proficiency, confidence, and creativity in articulating themselves adeptly in their second language.

## Appendices

• Name:

• Age:

Level:

**1. Are you familiar with the various types of AI applications available for improving English writing skills?**

- ☐ Yes - ☐ No

**2. How confident are you in using AI tools for writing tasks in English?**

- ☐ Very confident - ☐ Somewhat confident - ☐ Neutral - ☐ Not very confident - ☐ Not confident at all

**3. How would you rate the accessibility of AI writing tools for EFL learners, considering factors such as cost, ease of use, and availability of resources?**

- ☐ Very accessible - ☐ Somewhat accessible - ☐ Neutral - ☐ Not very accessible - ☐ Not accessible at all

**4. To what extent do you think AI writing tools cater to the individual learning needs and preferences of EFL learners?**

- ☐ Completely cater - ☐ Partially cater - ☐ Neutral - ☐ Minimally cater - ☐ Do not cater at all

**5. How do you perceive the role of AI in fostering learner autonomy and self-directed learning in English writing practice?**

- ☐ *Very important* - ☐ *Somewhat important* ☐ *Neutral* - ☐ *Not very important* ☐ *Not important at all*

**6. Do you believe that AI applications have the potential to revolutionize the way EFL learners approach writing instruction and practice?**

- ☐ *Strongly agree* - ☐ *Agree* - ☐ *Neutral* - ☐ *Disagree* - ☐ *Strongly disagree*

**7. How likely are you to recommend AI writing tools to other EFL learners for improving English writing skills?**

- ☐ *Very likely* - ☐ *Somewhat likely* - ☐ *Neutral* - ☐ *Not very likely* - ☐ *Not likely at all*

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