



Innovative Activities for Improving EFL Writing Skills and Reducing Anxiety through Artificial Intelligence

**Prepared by
Daniela Saba Abaqeen**

**Supervised by
Dr. Ahmad A.S. Tabieh**

**A Thesis Submitted in Partial Fulfillment of the Requirements of
the Master's Degree in Curriculum and Teaching Methods
at Middle East University**

January 2025

أنشطة مبتكرة لتحسين مهارات الكتابة باللغة الإنجليزية كلغة اجنبية
والحد من القلق من خلال الذكاء الاصطناعي

إعداد
دانيلا سابا البقاعين

إشراف
الدكتور أحمد عبد السميع طبية

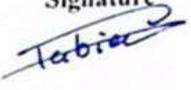
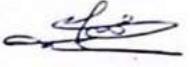
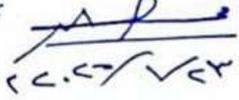
قدّمت هذه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير
في تخصص المناهج وطرق التدريس
في جامعة الشرق الأوسط

كانون الثاني، 2025

Thesis Committee Decision

This thesis: “**Innovative Activities for Improving EFL Writing Skills and Reducing Anxiety Through Artificial Intelligence**” was successfully defended and approved in 23 January 2025..

Examination Committee Members

Name	Workplace	Title	Signature
1. Dr. Ahmad A.S. Tabieh	Middle East University	Supervisor	
2. Prof. Mohammad A. Hamzeh	Middle East University	Internal Examiner – Committee head	
3. Dr. Ayat Al mughrabi	Middle East University	Internal Examiner	
4. Prof. Mohareb Ali Alsmadi	Al-Balqa' Applied University	External Examiner	

Authorization

I, **Daniela Saba Yaqoub ALbaqaen**, authorize the Middle East University to provide copies of my thesis on paper and electronically to libraries, organizations, and institutions concerned with scientific study and studies upon request.

Name: Daniela Saba Yaqoub Albaqaen

Date: 23 / 1 / 2025.

Signature: *Dana*

Acknowledgment

First and foremost, I express my heartfelt gratitude to God, the Most Gracious and Compassionate, for granting me success. Without His strength and guidance, I would not have been able to overcome the challenges along the way. Thank You for being my guiding light throughout this amazing journey.

*To my dearest husband **Hanna**, your constant encouragement, patience, and unbreakable belief in me have been and always will be my greatest source of motivation. Thank you for standing by my side, sharing my burdens, and celebrating every step of my progress. Your love and support means the world to me.*

*I am truly thankful for the guidance, support, and effort of **Dr. Ahmad Tabieh**. Your mentorship has been an invaluable part of my academic journey, and I truly appreciate your dedication and the time you spent throughout the research process.*

I sincerely thank Middle East University for providing me with an exceptional educational experience, valuable research opportunities, and unwavering support throughout my academic journey.

*To my dear son and daughter **Adam** and **Una**. You have been my source of strength and inspiration, Every day, I strive to be the role model you both deserve, so that you can grow up knowing the importance of always doing your best and not to give up but always glow where ever you go. I look forward to seeing the bright futures that await you, knowing they will be as beautiful as you are. Thank you for filling my life with purpose and happiness.*

I dedicate this work to the pure and angelic souls of my beloved parents, whose love and sacrifice shaped the person I am today. Your presence is felt in every step I take. This achievement is a testament to the love, wisdom, and the values you instilled in me. My angels in heaven, I miss you beyond words. I carry you in my heart always. This one is for you.

*Finally, I would like to express my gratitude to my beloved siblings **Sani**, **Sana** and **Dana**, for their understanding, support, and encouragement throughout the research process. Your presence has made this journey more meaningful.*

Dedication

To my father's soul.

To my mother's soul.

To my husband.

To my son Adam.

To my daughter Una.

To my brother and sister,

To all the loved ones...

To myself...

I dedicate this thesis.

Table of Contents

Subject	Page
Title	i
Thesis Committee Decision	ii
Authorization	iii
Acknowledgment	iv
Dedication	v
Table of Contents	vi
List of Tables	viii
List of Figures	ix
List of Appendices	x
Abstract in English.....	xi
Abstract in Arabic	xii
CHAPTER ONE: Background and Significance of the Study	1
1.1 Introduction	1
1.2 Problem Statement	3
1.3 Study Purpose.....	4
1.4 Study Questions	4
1.5 Significance of the Study	5
1.6 Definitions of Key Terms.....	5
1.7 Study Limitations and Delimitations	7
CHAPTER TWO: Theoretical Framework and Review of the Literature.....	8
2.1 Theoretical Framework	8
2.2 Literature Review	24
2.3 Comments on Previous Studies.....	29
CHAPTER THREE: Methodology and Procedures	32
3.1 Study Methodology	32
3.2 Study Design	32
3.3 Participation	33
3.4 Study Instruments.....	34
3.5 Statistical Analysis	42
3.6 Study Procedures.....	44
CHAPTER FOUR: Findings and Results	46
4.1 The findings related to question one: What are the most effective AI tools for enhancing EFL writing skills?	46

4.2 The findings related to question two: What are the ethical considerations surrounding the use of AI in teaching EFL writing instruction for EFL students?	48
4.3 The findings related to question three: What is the effect of using AI technology in writing instruction on EFL writing anxiety?.....	56
4.4 The findings related to question four: What is the effect of using AI technology in writing instruction on EFL students' writing performance?	58
CHAPTER FIVE: Discussion and Recommendations	60
5.1 Discussion related to question one: What are the most effective AI tools for enhancing EFL writing skills?	60
5.2 Discussion related to question two: What are the ethical considerations surrounding the use of AI in teaching EFL writing instruction for EFL students?.....	62
5.3 Discussion related to question three: What is the effect of using AI technology in writing instruction on EFL writing anxiety?	64
5.4 Discussion related to question four: What is the effect of using AI technology in writing instruction on EFL students' writing performance?.....	65
5.5 Recommendations	66
References.....	68

List of Tables

Chapter No. - Table No.	Table Content	Page
3 - 1	Distribution of participants by region, teaching experience, and AI and technology courses.	34
3 - 2	Timeline of the interview	36
3 - 3	Writing anxiety scale based on how they reflect the student's writing anxiety in English.	40
3 - 4	Correlation coefficients between the items of the writing anxiety scale and the total score.	41
4 - 1	Means and standard deviation of Anxiety writing according to measure levels	56
4 - 2	One-way repeated measures Anova of Anxiety writing	57
4 - 3	Post Comparisons between Measures levels of Anxiety writing	57
4 - 4	Means and standard deviation of writing performance according to measure levels	58
4 - 5	One-way repeated measures Anova of writing performance	58
4 - 6	Post Comparisons between Measures levels of writing performance	59

List of Figures

Chapter No. Fig. No.	Content	Page
2 - 1	ChatGPT	11
2 - 2(a)	Grammarly	12
2 - 2(b)	Grammarly	12
2 - 3	Wordtune	13
2-4	Hemingway	15
2-5	QuiltBot	16
2-6	Write and Improve by Cambridge English	17
2-7(a)	ProWritingAid	18
2-7(b)	ProWritingAid	18
2-8	Ginger Software	19
2-9	Microsoft Editor	20
2-10	Slick Write	21
2-11	LanguageTool	22
2-12(a)	Ask Dr.AI Portal in Planning and Implementation Phases	23
2-12(b)	Ask Dr.AI Portal in Implementation and Evaluation Phases	24
3 - 1	One group Pre-post-Sequential Measures	33
4-1	Ethical considerations of using AI Applications	48

List of Appendices

No.	Content	Page
1	Innovative Activities for Improving EFL Writing Skills and Reducing Anxiety Through Artificial Intelligence	73
2	Semi-Structured Interview	77
3	Writing Performance Exams	79
4	Writing Performance Rubric	82
5	Foreign Language writing Anxiety Scale	83
6	Ethical Considerations -First Interview	84
7	Ethical Considerations -Second Interview	89
8	Ethical Considerations -Third Interview	94
9	Ethical Considerations -Qualitative Content Analysis	102

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Abstract

This study was conducted to investigate the effectiveness of innovative activities supported by artificial intelligence (AI) on improving writing in English as a foreign language and reducing anxiety about writing in primary schools. The study employed a mixed method approach combining a qualitative approach with a quasi-experimental quantitative approach. The purposive sample was comprised of 30 male and female students in the seventh grade from a private school, as well as 15 teachers from various private schools in Jordan. A semi-structured interview, a writing performance test, and a writing anxiety scale were used after the researcher modified them to collect data. These instruments have reliability and validity rate correlation coefficients that make them suitable for use. Based on the results, ChatGPT, Wordtune, and Grammarly are the most effective AI applications for improving English writing skills. While the ethical considerations when using these applications in English writing revolve around seven domains: Plagiarism, Privacy and Data Security, fairness, transparency, teachers' roles, accessibility, and skills development. Furthermore, innovative English writing activities supported by artificial intelligence helped reduce students' writing anxiety and improve their writing skills. Training workshops for students to promote innovative activities in English writing and training teachers to use these activities in the classroom were recommended by the study.

Keywords: Writing skills, Writing anxiety, Artificial Intelligence (AI)

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إعداد

دانيلا سابا البقاعين

إشراف

الدكتور أحمد عبد السميع طبية

الملخص

هدفت الدراسة الى استقصاء فعالية الأنشطة الابتكارية المدعومة بالذكاء الاصطناعي (AI) في تحسين الكتابة باللغة الإنجليزية كلغة اجنبية، والحد من القلق الكتابي لدى طلبة المرحلة الأساسية في المدارس الخاصة. اتبعت الدراسة لتحقيق أهدافها المنهجية المختلطة القائمة على المنحى النوعي، والمنحى الكمي شبه التجريبي. وقد تم اختيار عينة قصدية مكونة من (30) طالب وطالبة من طلبة الصف السابع الاساسي في إحدى المدارس الخاصة، بالإضافة إلى (15) معلم من معلمي المرحلة الأساسية من مختلف المدارس الخاصة بالأردن. وقد تم جمع البيانات من خلال ثلاث أدوات تم تطويرها من قبل الباحثة، تمثلت في مقابلة شبه منظمة، اختبار لقياس الأداء الكتابي ومقياس للقلق الكتابي. وقد تم التحقق من صدقها وثباتها، حيث أظهرت معاملات الارتباط تمتع تلك الادوات بنسب صدق وثبات تجعلها صالحة للتطبيق. أظهرت النتائج أن معلمي اللغة الإنجليزية يعتقدون ان تطبيقات الذكاء الاصطناعي الأكثر فعالية في تحسين المهارات الكتابية باللغة الإنجليزية هي: Grammarly، Wordtune، ChatGPT. في حين أن الاعتبارات الأخلاقية الواجب مراعاتها عند استخدام تلك التطبيقات في الكتابة باللغة الإنجليزية تتركز في سبع محاور هي: الاستشهاد، السرية وامن المعلومات، العدالة، الشفافية، أدوار المعلمين، إمكانية الوصول، وتطوير المهارات. وقد أظهرت النتائج أيضا ان الأنشطة المبتكرة المدعومة بالذكاء الاصطناعي تحسن من مهارات الكتابة باللغة الإنجليزية وتساعد على خفض القلق الكتابي لدى الطلبة. وقد اوصت الدراسة بعقد ورشات تدريبية للطلبة لحثهم على توظيف الأنشطة المبتكرة في الكتابة باللغة الإنجليزية وبتدريب المعلمين على توظيف تلك الأنشطة في التدريس.

الكلمات المفتاحية: مهارات الكتابة، القلق الكتابي، الذكاء الاصطناعي.

CHAPTER ONE

Background and Significance of the Study

1.1 Introduction

Writing skills play a significant role in both academic and professional spheres, serving as an anchor for effective communication. In today's intertwined world, the ability to convey ideas cohesively and clearly through writing is more important than ever. Whether in the context of education, business, or to express oneself, strong writing skills are essential for conveying thoughts and ideas, fostering critical thinking, and building persuasive arguments while enhancing their overall communication abilities.

Given that writing is a foundational skill, students are expected to possess proficiency in this area (Ammade et al., 2020). Becoming proficient in writing at an early age strongly predicts a student's future success in both college and the workplace also (Wen & Walters, 2022).

Nonetheless, acquiring the skill of writing presents a unique set of challenges, for English as foreign language (EFL) learners often face a variety of hurdles, ranging from the basic formation of letters to the organization of their ideas, as well as mastering correct grammar, punctuation, and spelling.

The process approach views writing as a multi-step, cyclical activity where learners move through stages like planning, drafting, revising, editing, and publishing (Arslan & Kizil, 2010).

Writing is crucial not just for enhancing academic performance but also for fostering social and emotional development. Additionally, in today's competitive environment, proficient writing is a cornerstone for achieving success. Poor writing

skills could potentially hinder their prospects of securing future employment (Moses & Maslawati, 2019).

Amidst the importance of writing skills lies a challenge that many individuals face: writing anxiety. This psychological barrier can impede the development of writing abilities. (Moses & Maslawati, 2019). EFL students continue to struggle with understanding and using English language skills. Anxiety, identified as a primary challenge, has been acknowledged as a barrier in foreign language learning by researchers, teachers, and students alike (Rezaei & Jafari, 2014)

Foreign language anxiety is defined as a state marked by feelings of tension, apprehensive thoughts, and physiological responses such as heightened blood pressure. (American Physiological Association, 2018).

A restricted vocabulary, insufficient grammatical accuracy, and language proficiency, along with infrequent writing practice, are among the factors that heighten the likelihood of developing writing anxiety. Researchers have found that anxious students are more prone to making errors in writing in a foreign language due to their constant concern about the accuracy and authenticity of their written work (Rasool et al., 2023).

The use of AI technology can have pros and cons when it comes to EFL writing anxiety. On one hand, AI tools can provide immediate feedback on errors such as grammar, spelling, and sentence structure, which can help learners feel more confident knowing that they can rely on AI to catch these errors. On the other hand, some EFL learners may experience anxiety, fearing that they cannot write effectively without AI assistance.

With the advancement of technology and digital platforms, teaching and learning English has become more accessible. These resources now provide opportunities to enhance English language skills. (Fitria, 2021)

In general, AI can be a valuable tool for reducing EFL writing anxiety, but it is important for EFL learners to use it in a way that supports their confidence and independence in their writing skills.

AI is now becoming a core part of the digitalization of education. A variety of artificial intelligence tools have been developed to make the process of learning easier for students, such as Chat GPT, Grammarly and WorldTune. These AI tools enhance learning outcomes by providing feedback, identifying areas for improvement, along with offering interactive learning experiences. Adapting to individual learning styles and providing real-time assistance, they help students achieve better academic performance and deeper subject understanding. (Rahma & Fithriani, 2024).

1.2 Problem Statement

Written assignments are normally a requirement in any academic pursuit. However, writing has long been claimed to be an exceedingly difficult skill to acquire and is dreaded by L2 student (Daud et al.,2016).

Despite the increasing integration of AI technology in language learning, particularly in the field of English as a Foreign Language (EFL), its impact on writing anxiety and writing skills remains relatively unexplored (Nazari et al.,2021). Writing is a key skill in English language learning, but many students struggle with it. One common challenge they face is writing anxiety.

Cummings et al (2024) said the rapid change of AI technology meant that we could not predict how generative AI tools would function in September based on our knowledge in June. Furthermore, there were no established teaching methods for utilizing generative AI in education. And the uncertainty of how students would respond to the integration of AI technology. To introduce these powerful tools responsibly to budding writers, we had concerns about potentially overwhelming or disrupting their learning process.

1.3 Study Purpose

The purpose of this study is to examine the effects of innovative activities supported by artificial intelligence on EFL writing anxiety and writing skills.

1.4 Study Questions

- 1) What are the most effective AI tools for enhancing EFL writing skills?
- 2) What are the ethical considerations surrounding the use of AI in teaching EFL writing instruction for EFL students?
- 3) What is the effect of using AI technology in writing instruction on EFL writing anxiety?
- 4) What is the effect of using AI technology in writing instruction on EFL students' writing performance?

1.5 Significance of the Study

Theoretical significance

The significance of the study lies in addressing the involvement of AI technology in education, specifically when it comes to English as a Foreign Language (EFL) writing. Along with understanding the impact of AI technology on EFL learners' writing anxiety and writing skills.

Practical significance

This research is beneficial for enriching existing research. As we can also obtain a list of useful applications that aid students in enhancing their writing skills, we may also discover signs that can help identify factors that contribute to escalate anxiety in academic writing.

And it also lies in its exploration of how AI technology affects English as a Foreign Language (EFL) writing anxiety and writing skills. Understanding these effects can lead to improvements in EFL education, potentially enhancing student confidence and proficiency in writing. Additionally, the study may provide insights into the broader implications of AI technology in language learning and education. Along with providing training workshops for both teachers and students on how to use AI technology along with Awareness training workshop to help students reduce their writing anxiety.

1.6 Definitions of Key Terms

The study includes concepts and terms that require clarification, outlined as follows:

Artificial Intelligence (AI): According to Lu & Harris (2018), AI programs can be described as Intelligent Tutoring Systems (ITS) or adaptive tutors capable of simulating

human thought processes. that can make decisions, engage learners in conversations, respond to inquiries, and offer feedback.

Procedurally, it has been defined as the activities in the classroom that require EFL students to use artificial intelligence tools (ChatGPT, Wordtunes, Grammarly) to write in English.

English as a Foreign Language (EFL): English as a Foreign Language (EFL) refers to the process of learning or teaching English in a non-English-speaking environment, where English is not the primary language of communication. EFL learners are those who are studying English in such environments, typically to gain proficiency for academic, professional, or personal reasons.

Writing anxiety: Hassan (2001) is defined as one of the various types of anxiety experienced in language learning. Writing anxiety as generally avoiding tasks or situations that involve writing especially when there is a possibility of their writing being evaluated.

Procedurally, it has been measured by the level of writing anxiety among 7th graders, based on their responses to the foreign language anxiety questionnaire.

Writing skills: defined as the ability to express ideas, thoughts, and information clearly and effectively through writing. This includes planning, outlining, editing, revising, spelling, and using appropriate grammar, to convey meaning clearly and coherently. (Kaplan, Z, 2024)

Procedurally, writing skills levels are measured by students' grades on a writing skills test. Such as Grammar, Vocabulary and spelling, Cohesion and Coherence, Content and

Ideas, Organization and structure, Style and tone, Editing and Revision, Audience, awareness, fluency, Critical Thinking and Cultural awareness.

1.7 Study Limitations and Delimitations

Study Limitations

This study examined the effect of AI technology on EFL Writing Anxiety and Writing Skills among Jordanian EFL students. The researcher selected Jordanian EFL students from one school as the participants of the study. The participants were seventh grade students. The research also selected EFL teachers. Data were collected using the Writing Anxiety Scale and Writing Performance Test developed by the researcher to measure writing anxiety and writing performance levels of EFL students.

Study Delimitations

The level of student seriousness with the survey, combined with the study's one-month duration and two sessions per week, may not provide sufficient depth. Similarly, relying on a Rubric scoring guide might have minor errors or Shortfalls. In addition, by the time the study is completed, and its findings are presented, advancements in AI technology are likely to have occurred.

CHAPTER TWO

Theoretical Framework and Review of the Literature

This chapter discusses the theoretical framework, as well as a review of relevant theoretical literature and prior research.

2.1 Theoretical Framework

The English language is becoming more popular every single day, being widely spoken around the world. Many people choose to learn English as their foreign language to improve their career prospects and achieve greater success in life (Andayani, 2022). but when learning a new language writing becomes a crucial element in learning a foreign language as it requires more productivity than other skills (Kassem, 2017).

Writing is defined as “an action, a process of discovering and organizing ideas, putting them on paper and reshaping and revising them” (Moore & Murray, 2006, p. 36). As it refers to a sequence of well-connected sentences in a manner to convey ideas clearly (Sulisworo et al., 2016). Additionally, writing plays a crucial role in both language acquisition and academic success (Aloairdhi, 2019).

Writing is viewed as a complex and demanding task, whether in one's native language or a foreign language. as it can bring a mix of emotions, excitement for the challenge, frustration when facing difficulties, and empowerment as skills expand. The experience varies based on individual learning styles and backgrounds.

Rudiyanto (2017) said in order to achieve well-organized writing it requires learners to understand grammar, sentence structure, and use appropriate vocabulary. Therefore, as writing is considered a complex skill, it is often seen as the most challenging, even for high-ability learners. This complexity leads to various demands in

EFL writing, causing learners to feel demotivated, lost, uninterested, and anxious. This set of emotions is commonly referred to as writing anxiety.

Writing anxiety can be difficult for EFL learners as it can cause learners to feel uncomfortable or stressed about the entire learning process (Jugo, 2020). Anxiety can be described as "a feeling of wanting to do something that may happen or may have happened, so you think about it all the time, or is a feeling of wanting to do something very much, but being very worried that you will not succeed" (Summers, 2007, p. 58). Writing anxiety, as described by Al-Sawalha and Chow (2012), refers to a set of thoughts, emotions, or behavior that hinder an individual from starting, continuing, or completing a specific writing task, even though they have the ability to do so.

One of the main goals of AI tools is to analyze and perform tasks in a way similar to humans. AI applications offer flexibility and time-saving benefits, enhancing both teaching and learning experiences. These tools play a crucial role in assessment, tutoring, content generation, and providing feedback for both teachers and students. Perhaps one of the most significant contributions of digital writing tools lies in formative feedback and assessment, helping learners refine their writing skills. Additionally, new AI applications offer comprehensive instructional support and advanced plagiarism detection, assisting EFL students in improving their research writing process. (Zawacki-Richter et al., 2019).

The evolution of teaching writing in the current age of technology cannot be separated from the rapid advancement of digital tools. Chang et al. (2021) said that the use of AI technology in writing for EFL learners is growing fast. As it can check grammar, help with writing, and even make essays without the need of a person. They are simple to use and work well, which helps students and teachers save time and work.

Russel and Norvig (2016). summarize AI as the ability of machines to think and act in ways that are rational and human-like. Over the past decade, the field of artificial intelligence (AI) has made considerable progress, with Chat Generative Pre-Trained Transformer (ChatGPT - OpenAI's GPT-3 model) standing out as a notable example of this advancement (Aydın & Karaarslan, 2022).

Van et al. (2023) Clarify that ChatGPT can produce well-crafted student essays, prepare research papers, provide sufficient quality answers to pass medical exams, and generate useful computer code, among other tasks.

The journal Nature reported in 2022 that the use of ChatBots has already been used by scientists to assist in organizing thoughts, providing feedback on their work, writing code, and summarizing research literature (Van et al, 2023).

In recent years, AI has made remarkable progress in various fields, with models like ChatGPT, Grammarly, Wordtune, ChatBots and others showcasing human-like thinking and acting capabilities. ChatGPT, for instance, has demonstrated the ability to produce well-crafted writing. (Aydın & Karaarslan, 2022).

ChatGPT

ChatGPT can enhance the efficiency and quality of writing. They are especially beneficial for expanding text, creating outlines, and improving writing style.

ChatGPT is considered to be A version of OpenAI that is based on the GPT (Generative Pre-trained Transformer) language model. With its ability to generate human-like text, it can engage users in natural and intuitive conversations. OpenAI ChatGPT has been trained on a vast dataset of human conversations to understand a wide range of topics and contexts. Many fields can benefit from it, including chatbots,

customer service agents, and language translation systems. OpenAI ChatGPT produces natural and coherent text often indistinguishable from human-written content thanks to its state-of-the-art language model. (Aydın & Karaarslan, 2022). Figure 2-1 shows ChatGPT main page

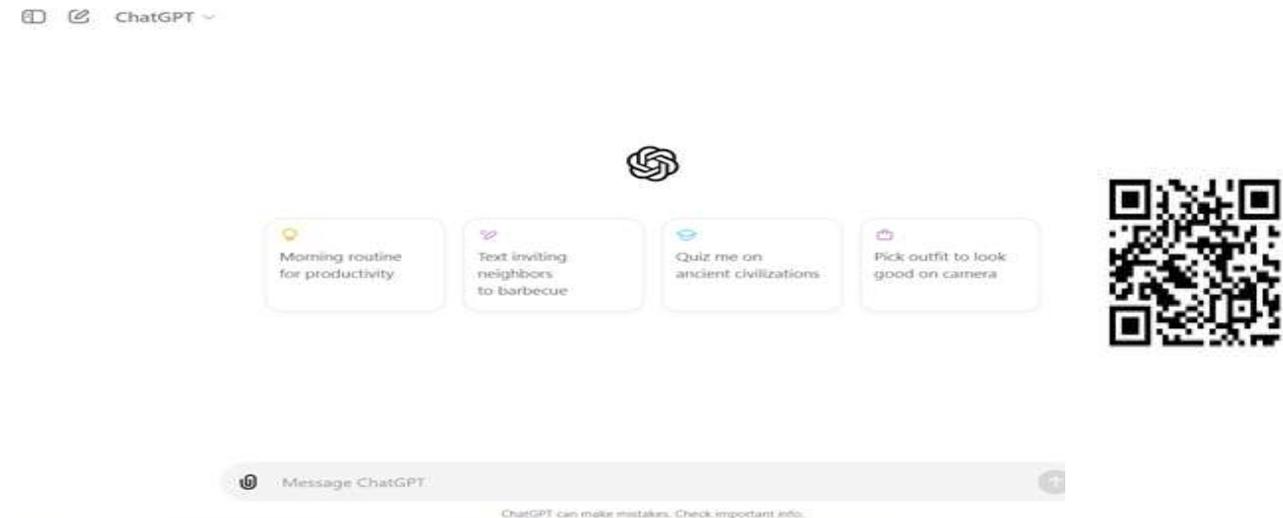


Figure 2-1. ChatGPT

Scan the QR code to access **ChatGPT** for further insights.

Grammarly

Grammarly is another AI application that used to correct errors in writing abstract English text. (Fadhilah et al.,2018)

Grammarly offers instant feedback and revision suggestions. Immediate feedback has been shown to positively influence engagement in web-based courses. This immediate revision can motivate students to make revisions based on the technology's scores (Moore and MacArthur, 2016). Grammarly also allows students to self-correct their tasks through revision before a summative assessment. It gives them the chance to improve their work before being graded by highlighting areas where students are

making mistakes. Developing self-regulatory skills is essential for managing the negative emotions associated with writing (Wei and Chou, 2020). Figure 2-2(a) and 2-2(b) shows Grammarly main page

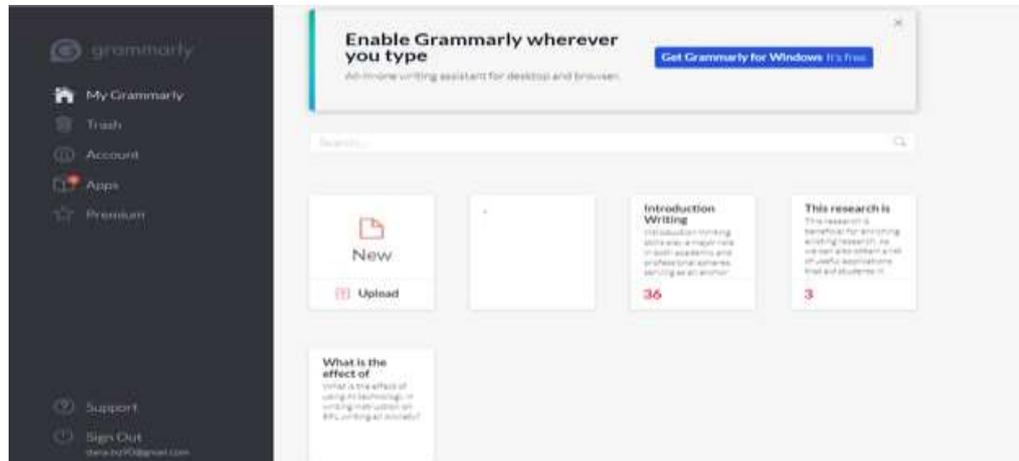


Figure 2-2(a). Grammarly

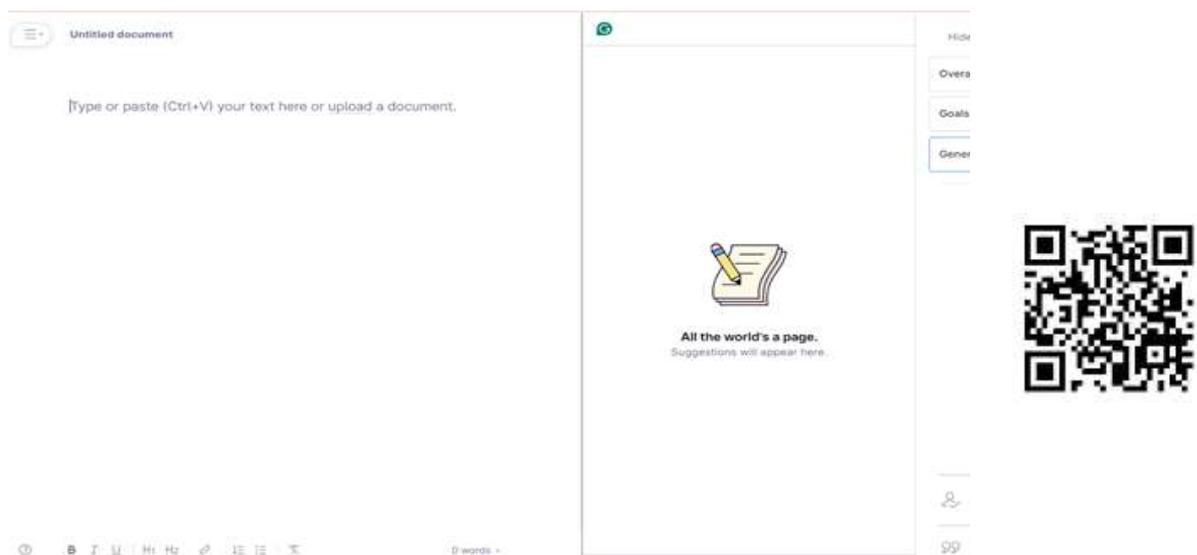


Figure 2-2(b). Grammarly

Scan the QR code to access **Grammarly** for further insights.

WordTune

WordTune is an AI-powered writing assistant designed to help users convey their ideas more effectively by providing alternative options that rephrase sentence structure

or replace words with synonyms while keeping the original meaning. Wordtune uses machine learning techniques, specifically Natural Language Processing. Wordtune understands and generates natural text based on extensive datasets of written material. Using Wordtune can greatly enhance the quality of your writing by offering a wide range of suggestions that improve sentence structure, enhance vocabulary, and ensure clarity and coherence. With its ability to generate natural text, Wordtune provides users with creative and effective ways to express their ideas, ultimately helping them become more confident and skilled writers. This tool offers suggestions for rewriting text in different tones (e.g., casual, formal) and lengths (e.g., shorten, expand), assisting EFL writers in maintaining a continuous flow and learning useful ways to express their ideas in written English. By recognizing patterns from large datasets. (Zhao, 2022).Figure 2-3 shows WordTune main page.

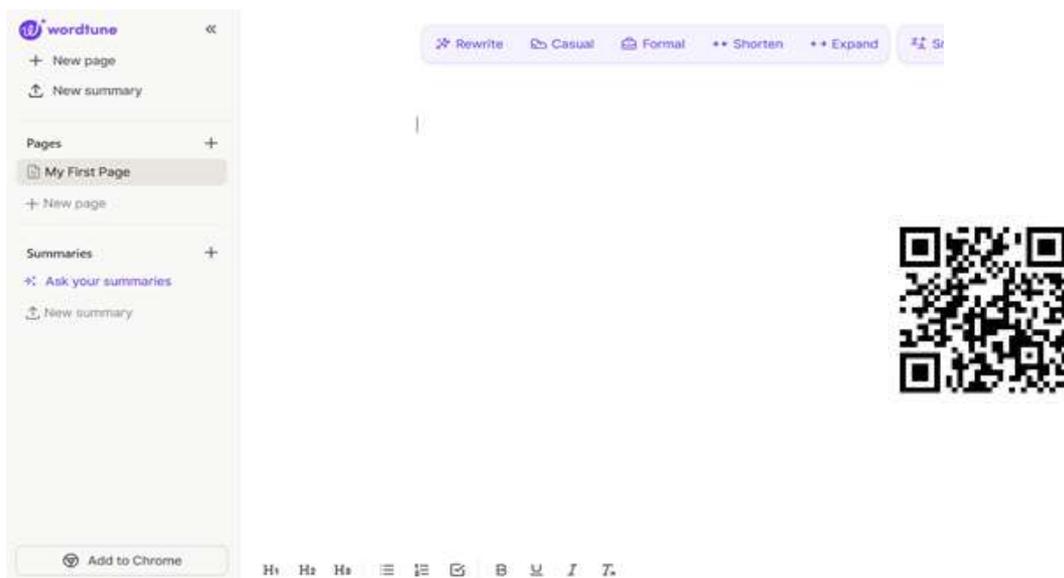


Figure 2-3. Wordtune

Scan the QR code to access **Wordtune** for further insights.

Hemingway Editor

Hemingway Editor is a web and desktop writing app that helps students to focus on writing what matters, as it shortens long sentences. Hemingway is more like a writing-improvement app, you need to be good at choosing which suggestions to take and which ones to ignore, as it is considered to be a helpful tool that provides suggestions for how to improve your writing. Hemingway Editor has two versions: one that is free and a paid one. This app uses colors to highlight sentences: if you see a yellow highlight, shorten or you can split it. If you see a red highlight, your sentence is so complicated that your readers might get lost trying to follow its meaning, try to edit the sentence to remove the red highlight. You can use a simpler word when you see a highlighted word in purple. Click on highlights to fix them. Weak phrases are marked in blue; you should replace them with more meaningful language. And for the Hemingway Editor Plus service, it uses AI to fix these highlights. Along with featuring an advanced grammar checker that marks any issue in green, it catches the trickiest errors. You also have the feature to change the style or tone of your writing by selecting text and using the "AI tools" button at the top. Figure 2-4 shows Hemingway's main page.

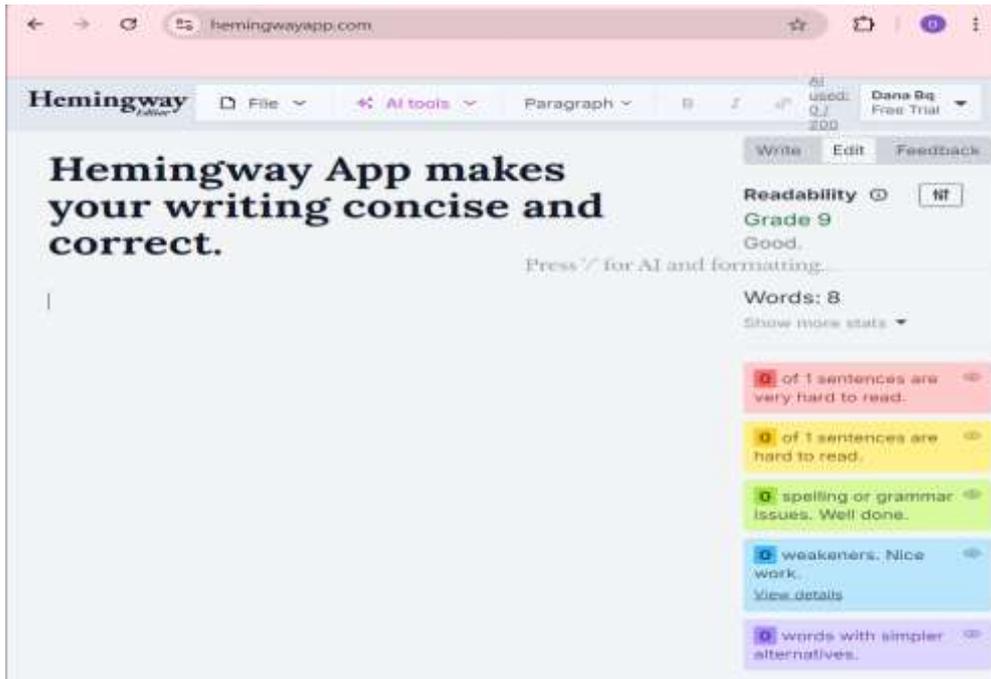


Figure 2-4 Hemingway

Scan the QR code to access **Hemingway** for further insights.

QuiltBot

QuillBot was created as a full-sentence dictionary to help students and professionals write more confidently and quickly. Users of this tool have employed it to prepare theses, craft legal emails, document translation, and create online content, among a variety of other uses. Figure 2-5 shows QuillBot main page.

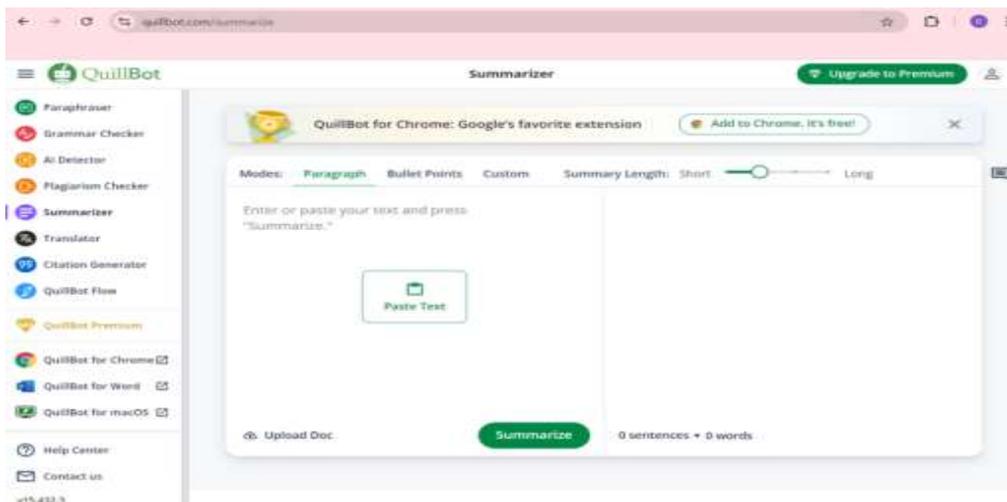


Figure 2-5 QuillBot

Scan the QR code to access **QuillBot** for further insights.

Write and improve by Cambridge English

Write & Improve is 'non-native speaker first' app that was designed exclusively to serve non-native speakers needs as it is aimed to help learners to become better EFL writer and editor of their own work

Write & Improve by Cambridge English provides a library of several essays it provides a practice environment, across multiple levels of proficiency, and encourages the learner to seek progress to a higher level in their writing generally, as it is very cautious on marking every single error rather it gives feedback i in a way that is designed to make the learner reflect on what they have already written and make it their decision whether they need to make a change or not.

W&I gives a variety of different types of feedback - summative (the CEFR level), formative (motivational feedback), a progress graph, word-level feedback, sentence-level feedback, and a prompt relevance score. Because W&I provide multiple feedback,

learners are able to compare their current writing with their previous work, to see that their own achievements. Figure 2-6 shows Write and Improve by Cambridge English main page

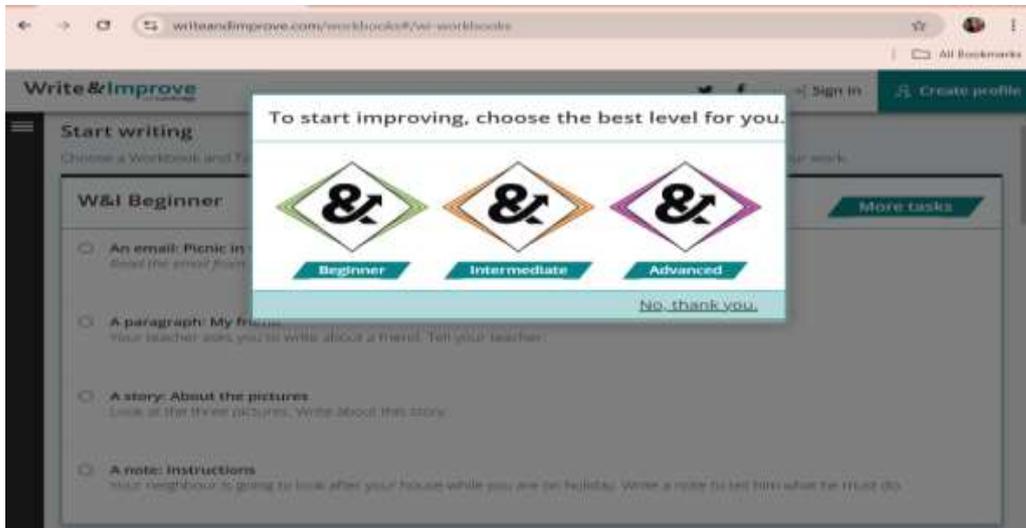


Figure 2-6 Write and Improve by Cambridge English

Scan the QR code to access **Write and Improve by Cambridge English** for further insights.

ProWritingAid

ProWritingAid is a comprehensive writing tool that offers applicable advices by improving writing skills component like grammar, style, readability and spelling mistakes to enhance your writing. By using ProWritingAid you can edit on anything you write, from a simple email to a full-length book. Once you have written anything you are done with your writing, you can use the app to check your work and make sure it is the best it can.

As this app uses AI it will help the learner to analyze their writing for issues like sticky sentences, repeated sentences and words, or structural problems, along with providing over 25 detailed writing reports. The learner can customize settings and run multiple reports at once using the Combo Report feature to meet their specific writing

needs. ProWritingAid integrates seamlessly with platforms like Google Docs, Microsoft Word, and more, allowing the learner to edit directly within their preferred writing environment. Figure 2-7(a) and 2-7(b) shows ProWritingAid main page

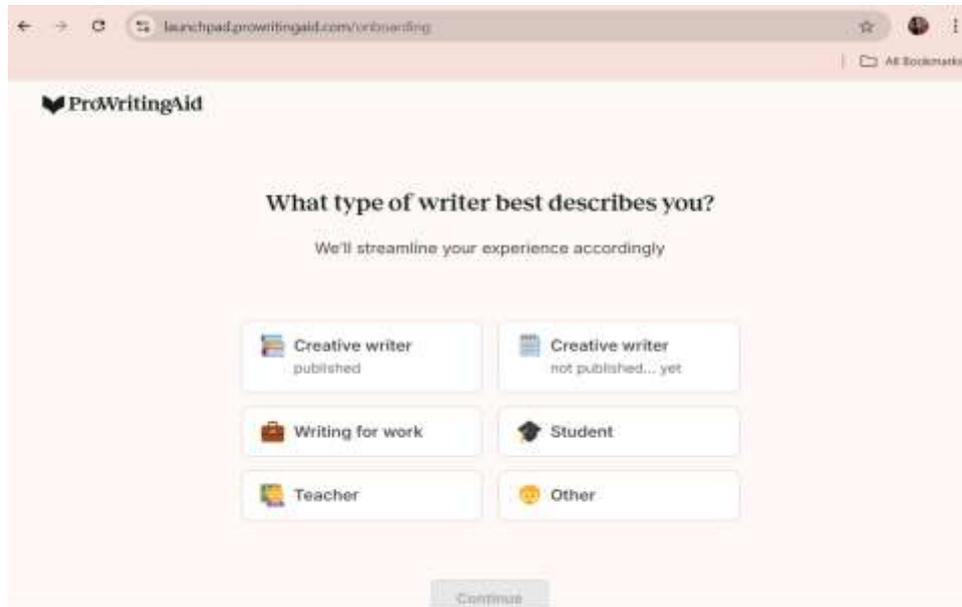


Figure 2-7(a) ProWritingAid

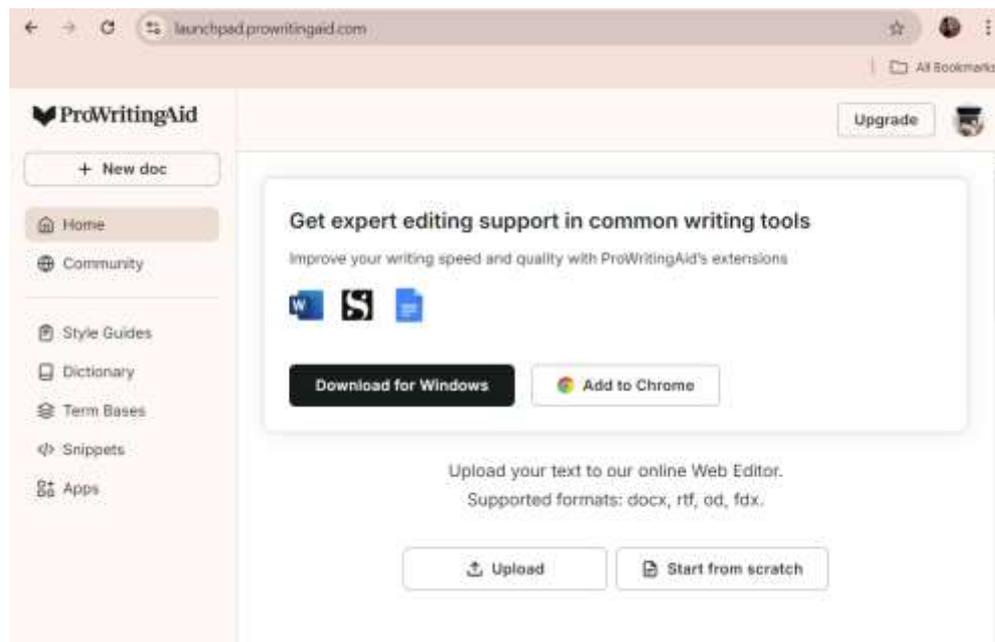


Figure 2-7(b) ProWritingAid

Scan the QR code to access **ProWritingAid** for further insights.

Ginger Software

Ginger is an AI-powered grammar and spell checker tool that focus on the English language. Ginger's goal is to qualify the lives of native and non-native English speakers, whether they are students, professionals, or users with writing struggles such as dyslexia. Millions of people around the whole wide world use Ginger Software tool to help them achieve better writing and confidence to write more creatively and without any doubts. As it features Grammar Checker, Sentence Rephrase, Translation, Punctuation Checker, Spell Checker, Personal Trainer, Online Proofreading and Essay Checker. Figure 2-8 shows Ginger Software main page

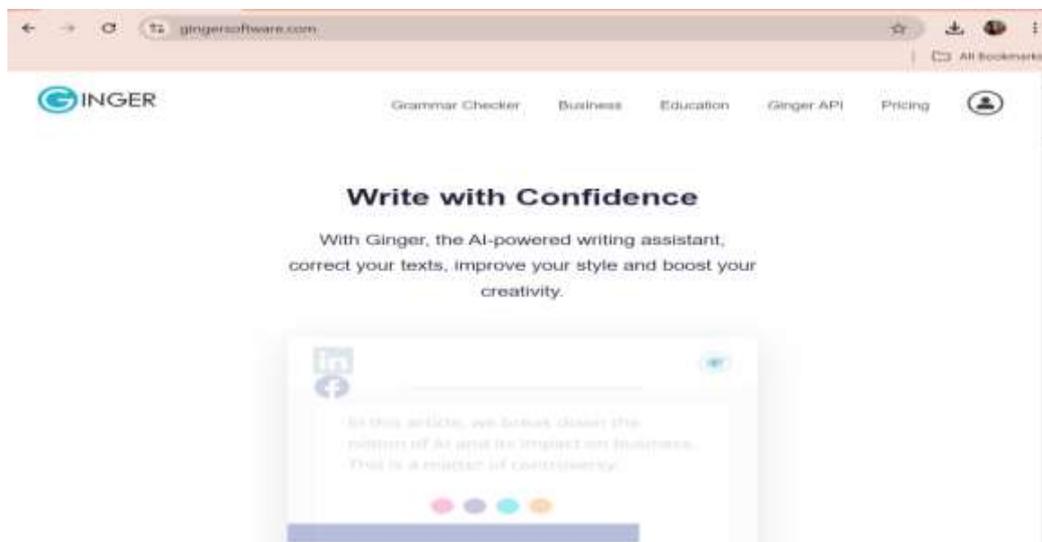


Figure 2-8 Ginger Software

Scan the QR code to access **Ginger Software** for further insights.

Microsoft Editor

Microsoft Editor is an AI assisted writing tool. It a simple free tool that provides spelling, and grammar checker. Along with refinements and changing the writing tone

if Microsoft Editor finds a misspelling word, it will underline it with a red line. If you'd like to change the spelling, you can click the underlined word, and choose the appropriate spelling that you want. Grammar and writing style work similarly. Figure 2-9 shows Microsoft Editor main page

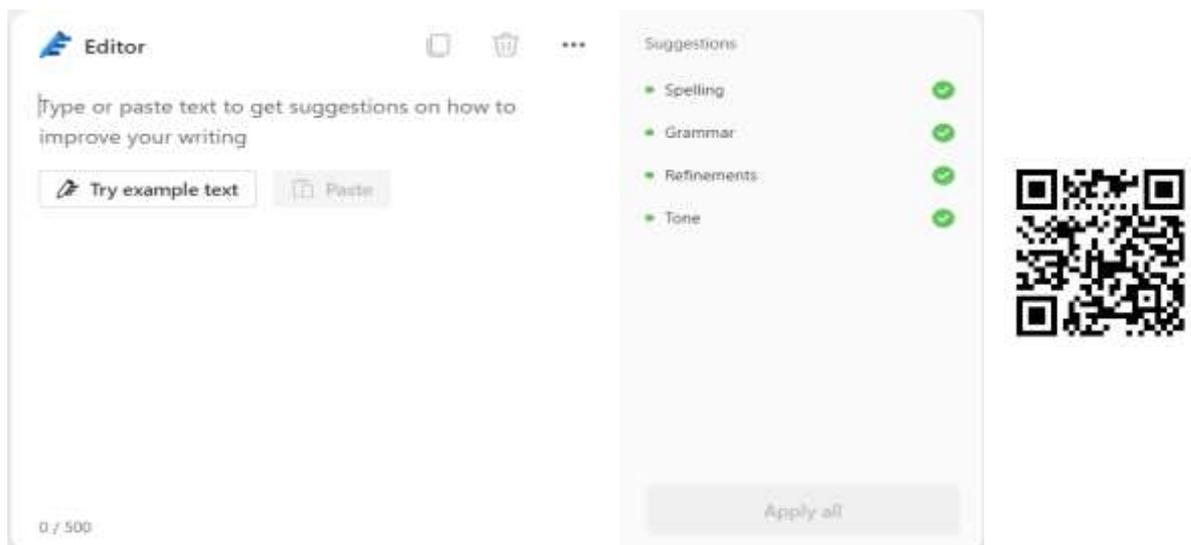


Figure 2-9 Microsoft Editor

Scan the QR code to access **Microsoft Editor** for further insights.

Slick Write

Slick Write is a powerful, free writing application that check your writing for any grammar errors, potential stylistic mistakes, and other features of interest. Slick Write can help learners to take their writing to the next level. As The grammar checker is fast, and feedbacks are Customizable to suit the learners style, Figure 2-10 shows Slick Write main page.

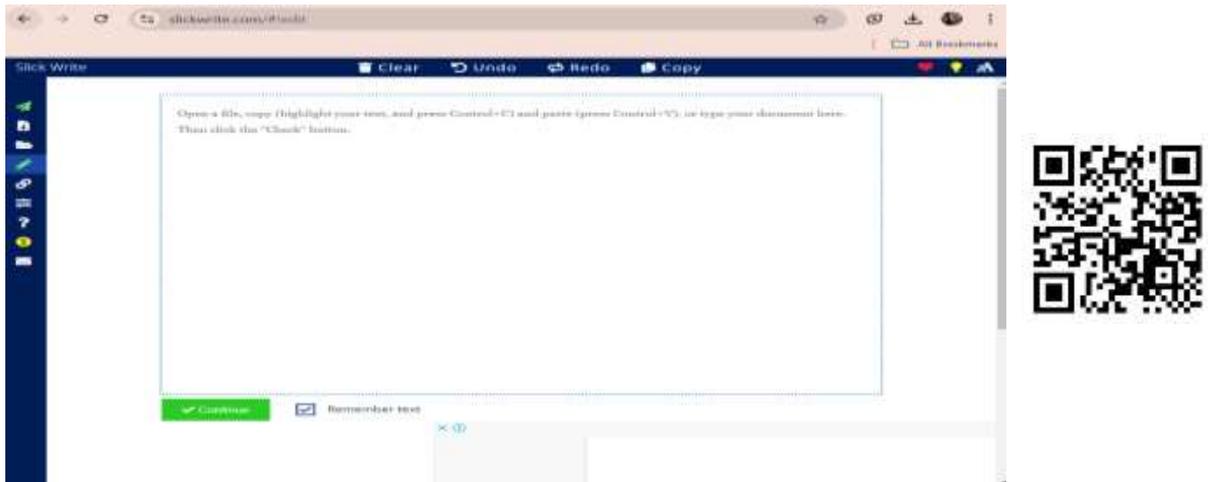


Figure 2-10 Slick Write

Scan the QR code to access **Slick Write** for further insights.

Language tool

The LanguageTool Editor is built by writers for writers. it provides learner a grammar and spell checker and ensure correct punctuation and typography. It also enriches the learner writing experience with style and tone suggestions that take their writing to the next level. Regular spelling mistakes are underlined in red. learner can either click directly on the word they want to correct or hit the corresponding card on the right hand side to get even more information regarding the error.

"Picky Mode" is provided by the tool to get more advanced suggestions to perfect your writing. Double clicking on any word will provide the learner with more alternative words to make their texts sound more diverse. Figure 2-11 shows Language Tool main page

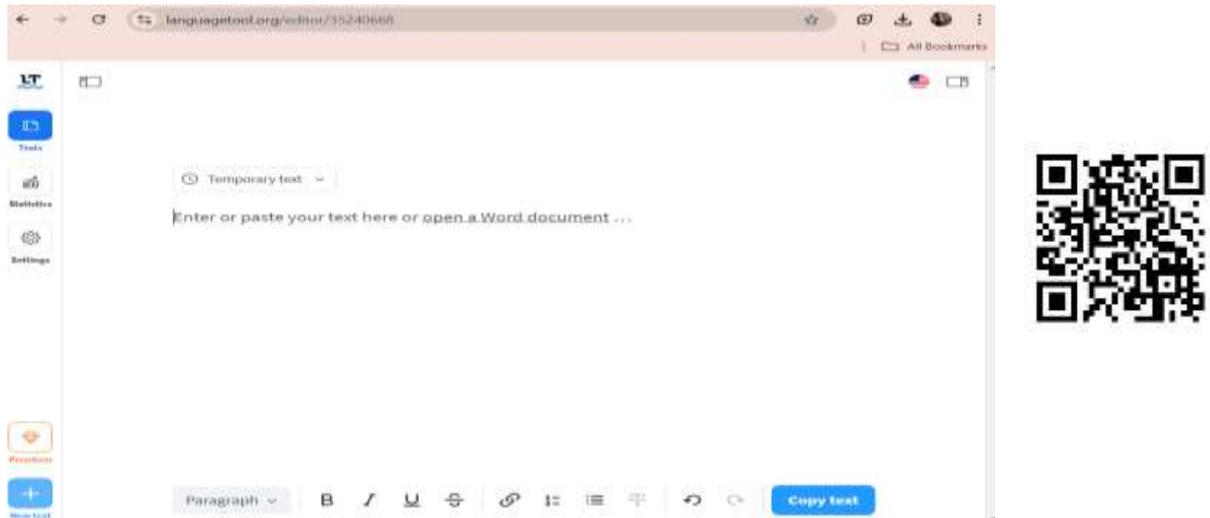


Figure 2-11 Language Tool

Scan the QR code to access **Language Tool** for further insights.

As for this study a portal will be done. The portal will provide a platform for users to access the study data. It will feature a user-friendly interface and a secure data storage system. Additionally, the portal will provide access to data analysis tools and other analytic features. Gathering three AI applications, ChatGPT, Grammarly and Wordtune.

The portal will also allow the user to access a knowledge base of AI-related resources and materials. Finally, the portal will provide support for the user's AI-related queries. To enhance their writing as EFL learners along with reducing their anxiety.

The portal will also provide instant feedback to the user on their writing progress. This feedback will be tailored to the individual user's needs and interests. The portal will also provide access to AI-driven chatbots to provide personalized guidance and advice on their writing.

Innovative Activities Supported by AI (Ask Dr.AI): The innovative AI activities were developed after brainstorming sessions between the researcher herself and a group

of expert teachers in the study sample. The researcher integrated the most three effective AI applications, as identified by the expert teachers who were interviewed through focused groups, into these activities. Ethical considerations were also taken into consideration during these interviews. Appendix 1 shows the general and specific model for the innovative activities. Figure 2-14(a), 2-14(b) shows the portal of **Innovative Activities Supported by AI**



Figure 2-12(a). Ask Dr.AI Portal in Planning and Implementation Phases

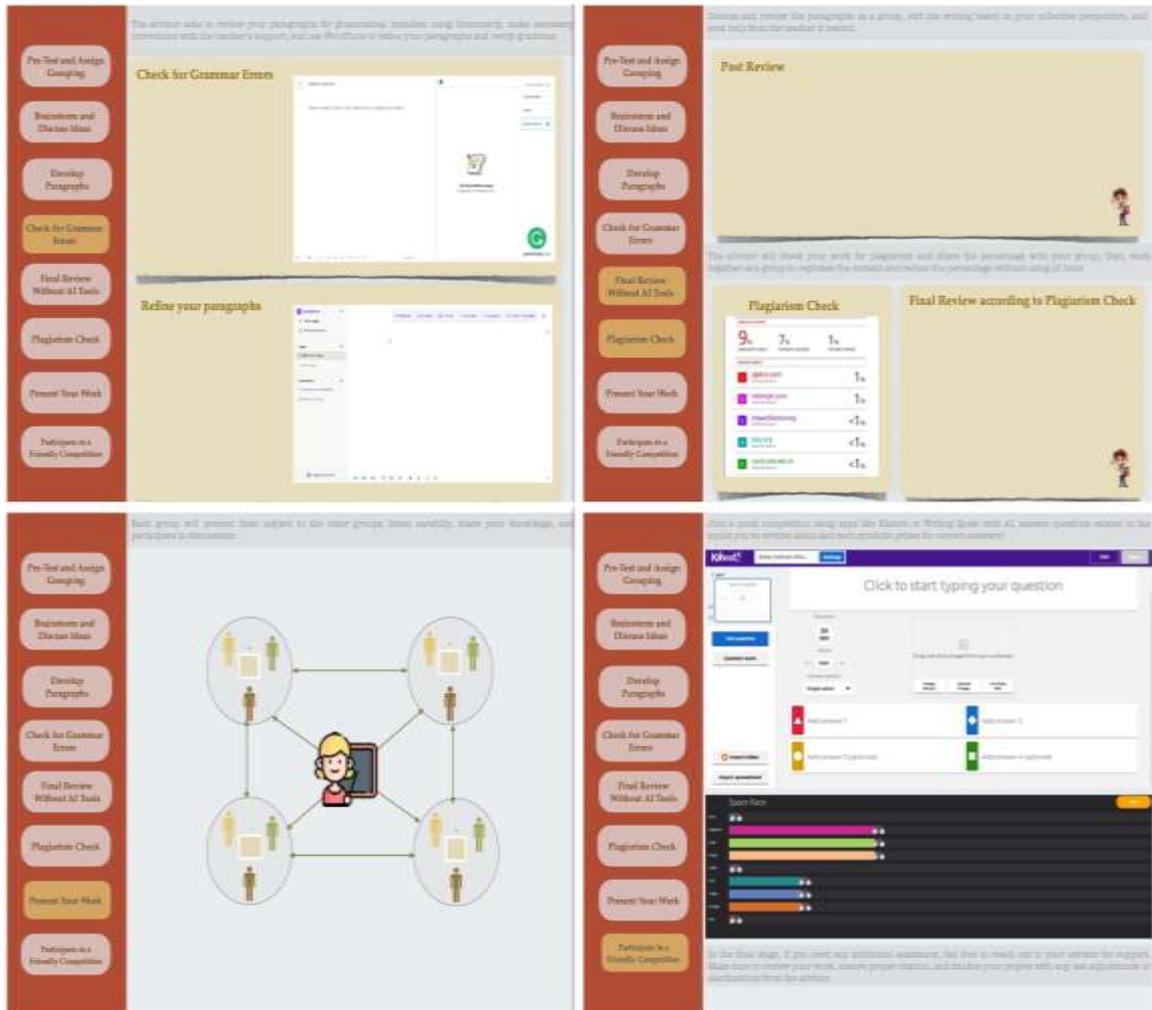


Figure 2-12(b). Ask Dr.AI Portal in Implementation and Evaluation Phases

2.2 Literature Review

Several studies were reviewed, accessing various databases, articles, and refereed journals. These studies focused on the effect of English as a Foreign Language (EFL) on writing anxiety and writing skills. The review aimed to draw insights from these studies, clarify points of agreement and divergence among them, and identify what will set this study apart from them. Listed from the oldest to the most recent as shown below.

Arslan and Kizil (2010) presented a quasi-experimental study that explores the impact of blog-centered writing instruction on the writing performance of intermediate English students at a Turkish university. The purpose of the study is to investigate

whether incorporating blogs into writing processes can enhance students' writing skills in Teaching English as a Foreign Language (TEFL) classroom. The study involved fifty participants, with 27 students in the experimental group and 23 students in the control group. The control group received traditional, in-class process-oriented writing instruction, while the experimental group integrated blogs into their writing processes using blog software. The findings, based on the analysis of students' written work, suggest that blog-integrated writing instruction led to greater improvements in writing performance compared to traditional in-class instruction alone. This study highlights the potential of blog software as a valuable tool for TEFL instructors in tertiary-level writing instruction.

Rezaei and Jafari (2014) conducted a semi-structured interview, along with the use of the Second Language Writing Anxiety Inventory (SLWAI) (Cheng, 2004) and the Causes of Writing Anxiety Inventory (CWAI), developed by the authors based on classroom observations and previous research on this issue. The participants were 120 EFL students from two higher education institutes in Shiraz, Iran. The study was conducted to examine the levels, types, and causes of writing anxiety among Iranian EFL students. The findings from this mixed-method design indicated a high level of writing anxiety, with cognitive anxiety being the dominant type. This was reflected in students' concern with performance and high expectations, fear of negative feedback from teachers, low self-confidence, and poor linguistic knowledge as the main sources of their anxiety.

Sumakul et al. (2021) conducted a semi-structured interviews with eight EFL students at a university in Indonesia who used an AI app in their writing classes. It was the goal of this study to examine how students viewed the use of artificial intelligence in their writing. According to the results, the students had positive perceptions of the AI

app. The students enjoyed the learning process, and the AI app helped the students with their writing. Moreover, this study also suggests that there are several things to consider when integrating AI in writing classes.

Chang et al (2021) Presented a quasi-experimental design study that investigated the impact of using AI-based writing feedback, specifically Grammarly, on the EFL writing performance and acceptance among students. Fifty-three EFL students from two conveniently selected classes in China participated in this quasi-experimental study. They were randomly assigned to either the experimental group (EG), where Grammarly was used for editing and revising essays, or the control group (CG), which received traditional instruction without Grammarly. Over a 16-week period, both groups completed five essays. Additionally, EG students' perceptions of Grammarly were surveyed at the study's conclusion. An independent t-test revealed that EG students significantly outperformed CG students in post-test writing performance, with a medium effect size (Cohen's $d = 0.603$). The survey's open-ended questions showed that students appreciated Grammarly's instant grammar correction. The study concludes with a discussion on Grammarly's drawbacks and future strategies for teaching EFL writing.

Wen and Walters (2022) conducted a meta-analysis of twenty empirical studies published between 1990 and 2020 to assess the impact of technology on the writing performance of elementary students. Additionally, the authors analysed the effect sizes of moderating variables, including types of technology integration, writing genres, demographics, and methodological characteristics. They found that the type of technology integration and writing genres are two critical variables affecting the causal relationship between technology and writing performance among elementary students.

wang et al (2022) implemented A quasi-experimental design to examine the impact of Spherical Video-based Virtual Reality (SVVR) and Automatic Writing Evaluation (AWE) powered by artificial intelligence on EFL writing. Additionally, interviews were conducted, followed by a thematic inductive qualitative analysis of the data, to explore the influence of this approach on students' learning behaviours and perceptions. within a university's EFL writing course, that included 37 students in the experimental group utilizing the SVVR–AWE approach, while 39 students in the control group adhered to the conventional AWE method. The study involved a university's EFL writing course, with 37 students in the experimental group utilizing the SVVR–AWE approach, while 39 students in the control group adhered to the conventional AWE method. The findings indicate that the integrated approach not only significantly improved students' EFL writing performance but also heightened their motivation, self-efficacy, and sense of presence, while reducing EFL writing anxiety.

Rad et al. (2023) Conducted a mixed-method study, which involved 46 students at the upper-intermediate level. The students were divided into two groups. control group as the first group, and the experimental group as the second group, each including 23 students. By using Wordtune, an AI-based application. This study explores the current use of AI in providing feedback in the writing classroom and to identify potential areas for further research on technology-driven feedback practices. This study used the Wordtune Application to enhance students' feedback literacy and engagement in L2 writing.

Rahma and Fithriani, (2024) employed a qualitative case study approach. which involved implementation interviews and observations, to investigate teacher perspective on using ChatGPT as a tool to support EFL learners' English writing, using qualitative

case study approach. The participants were 10 foreign language teachers from a private school located in North Sumatra, Indonesia. Those who are familiar with ChatGPT along with their experience with foreign language instruction participated. Questionnaires and in-depth interviews collected data on participants' viewpoints. The findings of this study showed the overall positive response of teachers on using ChatGPT to help improve students' writing quality. ChatGPT also provided useful writing features and enhanced language development. This study suggests that AI technologies like ChatGPT play a vital role in facilitating high-quality student academic writing.

Nawawi et al. (2024) conducted a qualitative research method on twenty students from the English education program at a State Islamic Institute in Palangka Raya, Central Kalimantan, Indonesia, who had successfully completed an Academic Writing Course. To recruit participants, the researchers used non-probability sampling, specifically purposive sampling. An analysis of the data was based on both structured and unstructured interviews.

Researchers investigated internal and external factors affecting English language learners' writing anxiety. The findings indicate that internal factors include a lack of experience in the writing process, while external factors include time pressure, evaluation methods, and linguistic difficulties. These internal and external factors contribute to students' anxiety during the writing process, particularly in the context of English language learning.

2.3 Comments on Previous Studies

Arslan and Kizil (2010) Conducted a study to investigate whether incorporating blogs into writing processes can enhance students' writing skills in Teaching English as a Foreign Language (TEFL) classroom. Chang et al (2021) Presented a quasi-experimental design study that investigated the impact of using AI-based writing feedback, specifically Grammarly, on EFL writing performance and acceptance among students. wang et al (2022) conducted a study to examine the impact of Spherical Video-based Virtual Reality (SVVR) and Automatic Writing Evaluation (AWE) powered by artificial intelligence on EFL writing.

The current study examined the effect of AI technology while the above studies used a specific technology along with all the other studies were conducted on the EFL writing performance whereas the main purpose of this study is to analyse not only the effect of AI technology on EFL writing skills but furthermore, on its effect on EFL writing anxiety.

Arslan and Kizil (2010), wang et al (2022) implemented their studies within EFL university students as this study was also conducted on university students along with interviewing professors from the same university.

Wen and Walters (2022) conducted a meta-analysis of 20 empirical studies published between 1990 and 2020 to assess the impact of technology on the writing performance of elementary students. The current study involved selecting university students and professors from the same university. to assess the effect of AI technology on EFL writing anxiety and writing skills

The study of Rahma and Fithriani (2024) employed a qualitative case study approach, which involved implementation interviews and observations, The participants

were 10 foreign language teachers from a private school located in North Sumatra, Indonesia. Those who are familiar with ChatGPT along with their experience with foreign language instruction participated. to investigate teacher perspective on using ChatGPT as a tool to support EFL learners' English writing.

The current study employed a quasi-experimental quantitative approach, while a qualitative approach will be taken to investigate the most important applications of artificial intelligence for improving EFL writing and the ethical issues that must be observed when using these AI applications (ChatGPT, Grammarly, and Wordtune). selecting a total of 30 students and 15 expert teachers to assess the effect of AI technology on EFL writing anxiety and writing skills by using innovative activities through a portal that integrates AI applications (ChatGPT, Grammarly, and Wordtune).

A mixed method was conducted for the study of Rad et al (2023), which involved 46 students at the upper-intermediate level By using Wordtune, an AI-based application. While the current study was conducted by selecting 30 students along with interviewing 15 expert teachers. to assess the effect of AI technology on EFL writing anxiety and writing skills by using a model that contains three of AI applications (ChatGPT, Grammarly, and Wordtune).

The purpose of the study of Sumakul et al (2021) is to examine how students viewed the use of artificial intelligence in their writing. While the current study is conducted to assess the effect of AI technology on EFL writing anxiety and writing skills

In the study of Nawawi et al. (2024), researchers examined both internal and external factors that affect students' writing anxiety when learning English. While the

current study examined the effect of AI technology on EFL writing anxiety and writing skills such as ChatGPT, Grammarly and Wordtune.

Rezaei and Jafari (2014) study examined the levels, types, and causes of writing anxiety among Iranian EFL students. While the current study examined the effect of writing anxiety on EFL learners and the effect of AI technology on their writing skills.

CHAPTER THREE

Methodology and Procedures

This chapter includes the study's methodology, the study population and its sample, as well as a description of the used method to select the study sample, the procedures used to develop the study tools, and the statistical methods applied to answer the study's questions.

3.1 Study Methodology

A mixed methodology based on qualitative and quantitative data analysis was employed in this study. The qualitative methodology was used to analyze the data to identify the most effective AI applications of artificial intelligence (AI) in improving EFL writing skills, as well as to determine the ethical considerations that should be taken into account when students write in English from the perspective of EFL teachers . a quasi-experimental quantitative approach was used to examine the impact of the innovative activities supported by artificial intelligence applications on improving EFL writing and anxiety reduction, as identified by the expert teachers involved in this study.

3.2 Study Design

The researcher used in this study a quasi-experimental design based on the repeated measurements for a single group (pre-test, post-test, and Sequential test) to assess the effectiveness of innovative activities in improving EFL skills and reducing writing anxiety in the study sample. As it is shown in Figure 1.

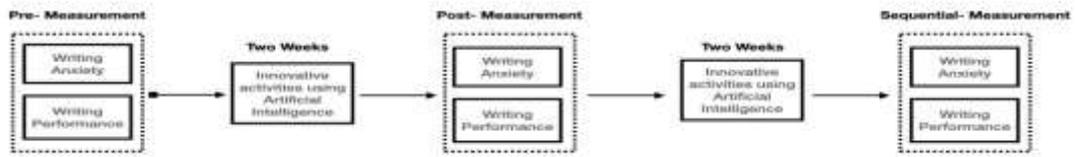


Figure 3-1. One group Pre-post-Sequential Measures

3.3 Participation

The study population consisted of two groups: the first group included all primary school level teachers from private schools in Amman area, and the second group consisted of all seventh-grade students from private schools in Amman area. purposive sampling method was used to form the study sample., as it consisting of two parts:

Part One: The first group of 15 primary school level teachers from private schools in Amman area, was selected by using judgmental sampling to identify the most effective Artificial Intelligence (AI) applications in improving EFL writing skills for students, as well as to determine the ethical considerations that should be taken into account when students write in English. The teachers met the following criteria:

- They work in different private schools across different geographic areas in Jordan.
- They have at least 5 years of experience in teaching English at the primary school level, particularly seventh grade.
- They have been recommended by school principals and coordinators for excellence in teaching English.
- They have taken courses in technology in general and AI applications in particular. Table 3-1 shows the participants distributions.

Table 3-1 Distribution of participants by region, teaching experience, and AI and technology courses.

Total	Numbers	Content	Standard
15	4	Private North Schools	Geographical area
	8	Private middle schools	
	3	Private south schools	
15	4	5 years	Teaching experience
	11	More than 5 years	
15	9	courses in technology in general	Courses in AI and technology
	6	Courses in AI applications	

Part Two: This part consisted of 30 male and female students from the seventh grade in a private school in Amman area, Purposive Sampling selected for testing the effectiveness of the innovative activities in improving EFL writing skills and reducing writing anxiety.

3.4 Study Instruments

The researcher designed a model supported by AI, to train the seven grade students on how to write in (EFL) English as a foreign language, in a learning environment that reduces writing anxiety in students. A written test was used to measure EFL writing skills, and an anxiety scale was used to measure the level of anxiety. The test and the anxiety scale were applied in three phases (pre-test, post-test, Sequential test). Additionally, the researcher developed a semi-structured interview with seven open-ended questions to identify the ethical considerations when using AI applications for EFL writing.

The Validity and Reliability of the Innovative Activities Supported by AI

Researcher conducted a brainstorming session with the interviewed English language teachers' experts to identify the most effective AI applications and ethical

considerations when using them. Four main phases were developed for the innovative model that emphasizes activities based on in-depth discussions: preparation, planning, implementation, and evaluation. The model was presented again to the same experts for adjustments based on their recommendations after it had been prepared.

An additional group of expert teachers and academics specializing in English language teaching methods was invited to review the model in several ways, including comprehensiveness, validity of the procedural steps, applicability in terms of time and procedure, taking into account ethical considerations from the study, its efficacy in improving English writing, and its ability to reduce students' writing anxiety.

Teachers and academics were provided with a list of ethical considerations and asked to evaluate how closely the model adhered to them. According to their feedback, they recommended to modifying the second step in the planning phase to use the ChatGPT application instead of students suggesting topics. The goal of this modification is to ensure randomness and to prevent students from relying on topics they are familiar with.

Also, the experts recommended that students be trained and made aware of ethical considerations before they start using the applications. This enhances the legal and beneficial use of these tools if they are familiarized with how to use them effectively. In addition, students with different levels of English were encouraged to participate in activities in groups, as this facilitates implementation within the specified time frame and reduces anxiety about writing among students. Lastly, the researcher tested the model on seventh grade students outside of the study sample twice to ensure its reliability and applicability. As shown in Appendix No. 1, the final version of the innovative activities contains all of the modifications made by the researcher.

Group recorded Interviews: The researcher developed an interview tool (Appendix 2 consisting of two separate phases). The first phase included a card containing the eleven most commonly used Artificial intelligence applications in writing English, along with the eleven skills that forms the writing skill. Teachers were asked to rate these writing skills in each of the AI application, and the averages and standard deviations were calculated to identify the most effective applications for EFL writing. The second phase involved dividing teachers into three focused groups to discuss the seven open-ended questions related to the ethical considerations when using AI applications for EFL writing. The interviews were conducted into three groups as each group had 5 expert teachers who met the criteria in table 1 these interviews were conducted either in-person or online and were audio-recorded. Table 2 shows the final Timeline of the interview in its final figure

Table 3-2 Timeline of the interview

Responsibly	Timeframe in minutes	Procedure
The researcher	2	Introducing the researcher, the aim of the study, and the interview procedures
Focused groups	5	Each teacher introduces herself in terms of experience, geographical area, and courses she has taken in the field of AI
Identify the meaning of plagiarism by the researcher	1	Ask the first question that focus on the ethical considerations that must be taken into account when using the most effective AI applications when writing in the English language and related to citation.
Focus group members individually and collectively	6	
Identify the meaning of f Privacy and Data security by the researcher	1	Ask the second question which focus on the ethical consideration of privacy and data security that should be taken into account when using the most effective AI applications when writing in English
	6	
Identify the meaning of fairness by the researcher	1	Ask the third question which focus on the ethical consideration of fairness that should be taken into account when using the most effective AI applications when writing in English
	6	

Responsibly	Timeframe in minutes	Procedure
Identify the meaning of transparency by the researcher	1	Ask the fourth question which focus on the ethical consideration of transparency that should be taken into account when using the most effective AI applications when writing in English
	6	
Identify the roles of the teacher by the teacher	1	Ask the fifth question which focus on the ethical consideration of teachers' role, that should be taken into account when using the most effective AI applications when writing in English
	6	
Identify the meaning of accessibility by the researcher	1	Ask the sixth question which focus on the ethical consideration of accessibility that should be taken into account when using the most effective AI applications when writing in English
	6	
Identify the meaning of skills development by the researcher	1	Ask the seventh question which focus on the ethical consideration of skills development that should be taken into account when using the most effective AI applications when writing in English
	6	
Researcher	1	End of the interview Thanks
57		Overall Time

The Validity and Reliability of the Interview Instrument

Through content validity the researcher ensured the validity of the tool, by presenting the tool to English language experts specializing in curriculum and teaching methods, as well as measurement and evaluation experts. Experts reviewed the seven open-ended questions as well as the card of the most commonly used Artificial Intelligence applications in writing English to ensure that they were framing, comprehensive, appropriate for the interview time, and able to explore ethical considerations.

The recommendation of experts was to modify the second question, originally phrased as "What are the ethical considerations related to confidentiality?" to "What are the ethical considerations related to privacy and data security?" They also suggested

adding a new question as the seventh: "From your perspective, what are the ethical considerations related to skill development?"

Additionally, they also provided notes on the time allocated for responding to each question. The tool was adjusted accordingly based on their recommendations. Finally, the tool was reviewed by an English language expert, who refined it and revised the phrasing of the interview procedures based on their feedback, resulting in the finalized version of the tool.

To verify the reliability of the interview tool, the qualitative stability over time method was used (Transferability). The tool was applied twice to a primary grade teacher, with a one-week apart between the first and the second applications. The teacher's first and second responses were compared, revealing a high degree of Qualitative similarity. Additionally, the researcher and supervisor qualitatively analyzed a part of the teachers' responses from the pilot sample. Results showed a similarity in thematic codes specified by each of them, indicating a high level of inter-rater reliability. This consistency indicates that the tool has an acceptable level of reliability, making it suitable to be used.

The Writing Performance Assessment

After reviewing the content of the seventh-grade English textbook A writing skill test was designed to measure students' writing performance. Based on this review, the researcher selected three different topics for the seventh-grade students to write about. The researcher outlined general instructions for the test which took one class period (Appendix 3). A quantitative scoring rubric was also developed to evaluate the test by the researcher, that has the essential criteria for the academic EFL writing (Appendix 4).

The researcher referred to several points when creating the scoring rubric, including the ones used for grading writing tasks in TOEFL and IELTS exams. In each phase of the test's implementation, it consisted of a single essay question presenting a real-life situation for the seventh-grade students to write about.

The scoring was conducted using a quantitative rubric comprising 11 indicators to assess the sub-skills required for writing in English. The rubric employed a five-point scale, with each indicator scored between 1 (minimum) and 5 (maximum). Thus, the total score for grading a student's writing performance was 55 points, which was then converted to a percentage for statistical analysis.

Writing performance test Validity

The researcher presented the writing performance test and its quantitative scoring rubric to a committee of reviewers, including teachers of the seventh-grade, education supervisors, and academics specializing in English language curriculum and teaching methods. to get their expert feedback regarding several aspects of the test and its scoring tools: the comprehensiveness of the test and the used rubric in covering the skills of English writing, the degree of which the test achieved its intended objectives, and the overall format of the test and the used rubric, including organization, structure, and clarity of the instructions.

Based on their feedback, some of the questions were rephrased with greater precision. With the final adjustments it resulted the finalized version of the test, as shown in Appendix 3.

Reliability, difficulty, and discrimination coefficients of the writing performance test:

The researcher verified the reliability of the writing performance test using the Cronbach's alpha coefficient, which was (0.78, 0.91, 0.88), and these values are acceptable in such studies (Delio, 2014). The difficulty coefficients for the three questions were (0.63, 0.52, 0.44), and the discrimination coefficients were (0.48, 0.29, 0.31). According to the difficulty and discrimination coefficients, the test is appropriate and valid (Crocker & Algina, 1986).

Anxiety writing

Writing anxiety Scale: To develop the writing anxiety scale, the researcher benefited from previous studies that are related to and addressees' anxiety in general. After consulting with a group of experienced teachers, it was agreed to adopt the English writing anxiety scale developed by Daly & Miller (1975) as it was seen the most suitable scale to be used for this study.

The scale's statements were reviewed, rephrased, and adapted to better align with the Jordanian context and culture. The finalized scale consists of 19 items (Appendix 5). Table 3-3 shows an overview of the distribution of the scale's items in terms of their representation of writing anxiety.

Table 3-3. Writing anxiety scale based on how they reflect the student's writing anxiety in English.

Status	Paragraphs	Number of paragraphs	scale				
			strongly agree	agree	neutral	disagree	strongly disagree
Paragraphs that express a writing anxiety	1, 4, 5, 6, 11, 14, 15, 17, 18, 19	10	5	4	3	2	1
Paragraphs that doesn't express a writing anxiety	2, 3, 7, 8, 9, 10, 12, 13, 16	9	1	2	3	4	5

Content and Construct Validity of the Writing Anxiety Scale

The scale was presented to a group of experts in English language teaching methods from both public and private universities to see their feedback on the appropriateness of the language used in the statements for the seventh-grade students and the relevance of the statements in measuring writing anxiety. Based on their comments, some items were rephrased, others were removed, and new statements were added. Additionally, the scale was revised to use a five-point format instead of a three-point, resulting in the final version that consists of 19 items.

To verify internal consistency, correlation coefficients between the items and the total score were calculated. Table 4 presents these correlation coefficients, which indicate that the items of the scale have statistically significant correlations with the total score, demonstrating a high level of internal consistency.

Table 3-4: Correlation coefficients between the items of the writing anxiety scale and the total score.

paragraph	Correlation	paragraph	Correlation	paragraph	Correlation
1	0.85*	8	0.82*	15	0.87*
2	0.71*	9	0.63*	16	0.79*
3	0.68*	10	0.71*	17	0.83*
4	0.73*	11	0.56*	18	0.66*
5	0.78*	12	0.72*	19	0.75*
6	0.69*	13	0.91*		
7	0.77*	14	0.88*		

*Significant at the 0.01 level

Reliability of the Writing Anxiety Scale

To ensure the reliability of the writing anxiety scale, the apply and re-apply method was used. The reliability coefficient of the scale was found to be 0.89, which indicates that the scale has an acceptable level of reliability, making it suitable to be used.

3.5 Statistical Analysis

The study used the following statistical methods to answer the research questions:

1. Descriptive statistics, including means and standard deviations, to determine the rankings of the most effective AI applications in EFL writing
2. Qualitative content analysis to identify the ethical considerations that should be taken into account when using AI applications for writing in English. The qualitative procedures followed to examine the ethical considerations for using the most effective AI applications in English writing included the following:
 - Fifteen primary teachers were selected who met the criteria which was mentioned in the study population which is related to the ethical considerations.
 - Teachers were divided into three focused groups each group consisted of five teachers making sure that each group included teachers from various geographical area, years of experience, training in the area of AI which makes the identifying the ethical consideration more creditable
 - It was agreed to conduct some of the interviews online at times outside of the regular working hours, which facilitated the participation in interviews, both in terms of time and location, allowing all teachers to participate regardless of their location. The interviews, whether it was in-person or

online, were conducted and recorded audio interviews via TEAMS, with an approximate duration of 60 minutes.

- All interviews began with the researcher explaining the purpose of the interviews, outlining the guidelines of the interview, and assuring that the data would be kept 100% confidential and used only for research purposes. The researcher also clarified that teacher names would not be mentioned, instead, coding would be used. Table 2 shows the timeline of the interview process, and Appendix 2 provides the interview tool.
- The researcher repeatedly listened to the interview's audio recordings, transcribed the content of each of the three interviews in writing using Invivo, and then read and compared its comprehensiveness with the audio recordings. The written analyses were then summarized and presented in a way that was easy to understand. Then a table was created to track the ethical considerations in each of the three interviews and for each domain, which included the teacher's name, teacher code, interview number, and the ethical considerations related to the domain. The researcher reviewed and refined this table to ensure that the ethical considerations listed truly pertained to the respective domain. As a result of this review, some ethical considerations were moved from one domain to another.
- The final ethical considerations for each of the seven domains were derived from each of the three interviews (Appendices 6, 7, 8).
- A specific model for analyzing ethical considerations was developed, integrating them across the seven domains of the tool: citation, privacy and data security, fairness, transparency, teacher roles, accessibility, and skills

development. Appendix 9 presents the final version of the ethical considerations.

3. A one-way Anova repeated measures was conducted to assess the effectiveness of the innovative activities supported by AI for improving EFL writing skills and reducing writing anxiety.
4. The practical significance of the effect size was also calculated.

3.6 Study Procedures

This study followed the following procedures:

- Reviewing the theoretical literature and previous studies related to this study topic, and designing a proposal for the innovative activities that aims at improve writing in English, and taking into consideration to include procedures ton how to reduce EFL writing anxiety
- Preparing all of the study tools, including the semi-structured interview, writing performance test, and writing anxiety scale, along with verifying the psychometric properties of each used tool in this study.
- Defining the study sample and problem in two sections: primary school teachers from private schools and seventh-grade students from a private school. The sample members in both sections were purposefully selected.
- Forming three focus groups, each consists of five teachers, representing the first section of the study sample.
- Conducting audio-recorded interviews with the three groups, analyzing them qualitatively, then extracting results related to the first and second questions concerning the most effective applications in English writing along with the ethical considerations that should be reviewed when using those applications.

- Holding trainings for students on the use of AI applications, derived from the results of the first question, and the ethical considerations to be taken into account when using the AI applications, based on the qualitative analysis of the second question in this study.
- Conducting a pre-test for writing performance and writing anxiety scale.
- Implementing the innovative activities with the students for two weeks, with two sessions each week.
- Conducting a post-test for writing performance and writing anxiety scale.
- Implementing the innovative activities with the students for another two weeks, with two consecutive sessions each week.
- Conducting a sequential test for writing performance and writing anxiety scale.
- Analyzing the quantitative data for the three measurements of writing performance and writing anxiety (pre-test, post-test, and sequential) and then write the results on the effectiveness of the innovative activities in improving writing performance and reducing writing anxiety.
- Writing recommendations based on the overall study results.

CHAPTER FOUR

Findings and Results

This chapter summarized the study's findings by responding to the study's specified questions, and the following is a summary of the study's findings.

4.1 The findings related to question one: What are the most effective AI tools for enhancing EFL writing skills?

AI APPLICATIONS	MEANS	SD	RANK
Chat GPT	8.09	1.11	1
Wordtune	7.57	1.26	2
Grammarly	7.34	1.29	3
ProWritingAid	7.25	1.21	4
QuiltBot	7.09	1.14	5
Slick Write	6.82	1.12	6
Hemingway Editor	6.81	1.30	7
Microsof Editor	6.79	1.23	8
Write and Improve by Cambridge English	6.58	1.04	9
Language Tool	6.38	1.12	10
Ginger Softwar	6.13	1.08	11

Based on Table (1-A), expert teachers believe ChatGPT is the most effective AI-powered tool for improving English writing as a foreign language, with mean (8.09) and a standard deviation (1.11), followed by WordTone, which has mean (7.57) and a standard deviation (1.26). Grammarly ranked third with mean of 7.34 and a standard deviation of 1.29.

Expert teachers agreed that applications “Writing and Improve by Cambridge, Language Tool, Ginger Software” came in the last three ranks (ninth, tenth, eleventh) with means (6.58, 6.38, 6.13) and standard deviations (1.04, 1.12, 1.08), respectively.

AI TOOLS	Grammarly	Hemingway Editor	QuiltBot	Write and Improve by Cambridge English	ProWritingAid	Ginger Software	Microsoft Editor	Slick Write	Language Tool	Chat GPT	WordTune	OVERALL	
The ability of an AI application to address writing skills components	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	(1-10)	SD	Mean
Grammar	8.87	8.00	7.73	7.53	8.20	7.40	8.07	7.60	8.07	8.87	8.73	0.53	8.10
Vocabulary and Spelling	8.33	7.60	7.73	7.47	8.20	7.00	7.93	7.40	7.73	8.87	8.60	0.56	7.90
cohesion and coherence	7.60	7.00	7.13	6.73	7.73	6.33	7.33	6.80	7.07	8.60	7.93	0.64	7.30
Content and Ideas	7.67	7.00	7.13	6.33	7.07	5.93	7.27	6.73	6.60	8.73	8.27	0.82	7.16
Organization and Structure	7.67	7.40	7.53	6.73	8.07	6.53	7.67	6.93	7.13	8.60	7.93	0.61	7.47
Style and Tone	7.93	7.93	7.13	6.47	7.80	6.27	7.47	7.00	7.20	8.53	8.00	0.69	7.43
Editing and Revision	8.27	7.80	7.87	7.13	8.07	7.00	8.13	7.40	7.87	8.53	8.13	0.48	7.84
Audience Awareness	6.07	5.47	5.60	5.40	6.27	4.93	5.87	5.40	5.67	7.20	6.27	0.61	5.83
Fluency	8.00	7.47	7.47	7.40	8.07	7.07	7.87	7.20	7.60	8.60	8.40	0.49	7.74
Critical Thinking	5.67	5.00	5.27	4.73	5.67	4.93	5.60	5.60	5.60	7.13	6.27	0.67	5.59
Cultural awareness	4.69	4.21	4.14	4.29	4.64	4.00	4.79	4.29	4.50	5.29	4.71	0.37	4.50
MEANS	7.34	6.81	6.79	6.38	7.25	6.13	7.09	6.58	6.82	8.09	7.57	0.59	6.99
SD	1.29	1.30	1.23	1.12	1.21	1.08	1.14	1.04	1.12	1.11	1.26	0.12	1.16
All tools order according to overall	3	7	5	9	4	11	8	6	10	1	2		

As shown from table (1-B) that some of the writing skills didn't get any attention from the AI applications due to the teacher's point of view and some got the highest attention of each application as the grammar skill got the highest in Grammarly, hemingway Editor, ProWritingAid, Ginger Software, Slick write, Language Tool, ChatGPT and WordTune applications. For the vocabulary and spelling skills in ProWritingAid and ChatGPT applications, for the editing and revision skill got the highest attention in Quiltbolt and Microsoft Editor applications, and for the organization and structure writing skill got the highest attention in Write and Improve by Cambridge English Application

The overlooked writing skills in the AI applications was cohesion and coherence, content and ideas, style and tone, audience awareness, fluency, and cultural awareness.

4.2 The findings related to question two: What are the ethical considerations surrounding the use of AI in teaching EFL writing instruction for EFL students?

Figure 4-1. Ethical considerations of using AI Applications

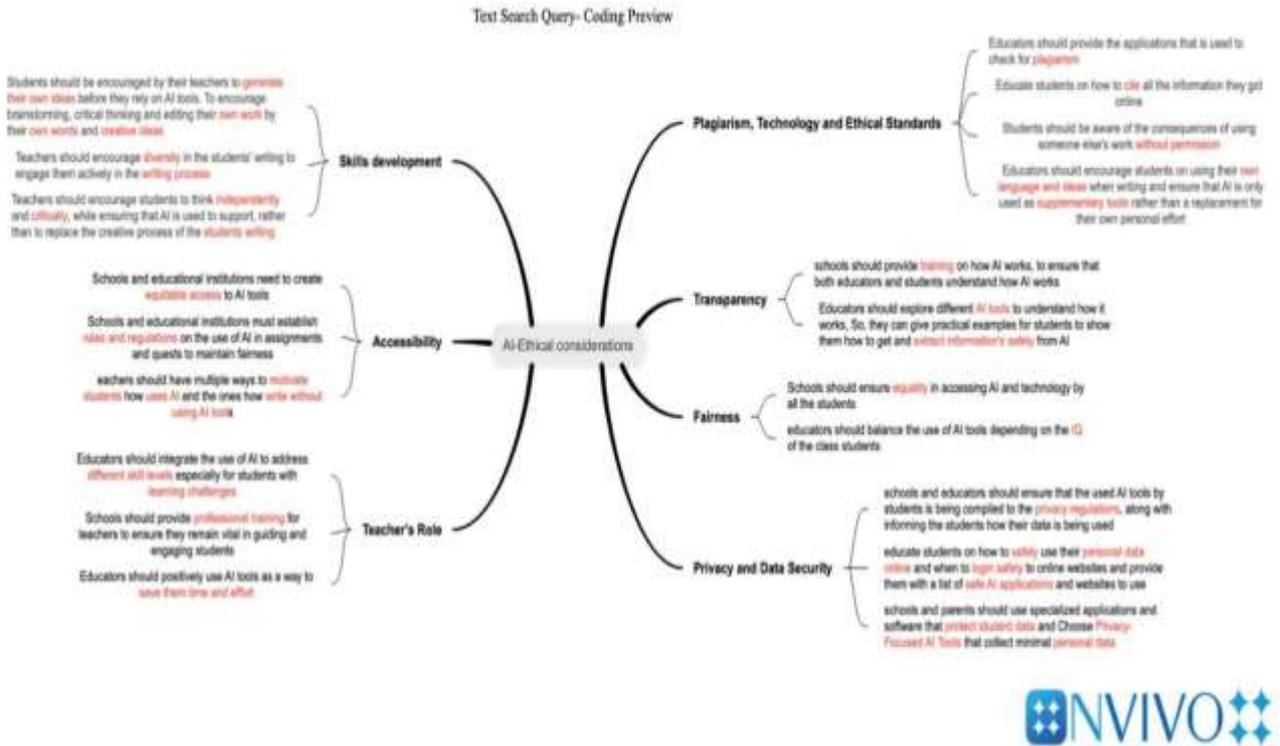


Figure 4-1. Ethical considerations of using AI Applications

Figure 4-1. shows the Ethical considerations of using AI Applications in EFL writing skills. the ethical considerations when using these applications in English writing should revolve around seven domains: Plagiarism, Privacy and Data Security, fairness, transparency, teachers' roles, accessibility, and skills development

Ethical Consideration of Plagiarism, Technology and Ethical Standards.

It is well known that Plagiarism occurs when using someone else's work, ideas, or projects, and presenting them as their own., this can involve copying from sources, using someone else's ideas without credit, or editing on it. Several strategies can be

done to educate students about plagiarism. starting by using examples to illustrate and explain what plagiarism is, then Introduce plagiarism detection tools to help students check their own work for originality. Educate students on how to cite sources using basic formats (e.g., "Author, Title, Year").and how to cite sources using different citation styles. Consistently conduct workshops on citation.to teach proper citation. Discuss copyright by educating students about the concept of copyright and the rights of the authors. And help students understand the importance of authenticity and emphasize the ethical importance of rephrasing ideas using their own words while building on them. Additionally, making sure to discuss the consequences of plagiarism, including the academic and ethical consequences of using someone else's work or ideas without proper credit. As this approach fosters responsible and ethical writing habits. While Educating students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole assignments for them. To encourage students to re-state what they have taken from any resource using their own language. On a regular basis classroom discussion should be implemented, to talk about plagiarism and why it is important to write one's original work. Incorporate Technology into lessons as a way to brainstorm ideas, to improve sentence structure, or even practice vocabulary.

Considerations

- 1) Educators should provide the applications that is used to check for plagiarism
- 2) Students should be aware of the consequences of using someone else's work without permission
- 3) Educate students on how to cite all the information they got online

- 4) Educators should encourage students on using their own language and ideas when writing and ensure that AI is only used as supplementary tool rather than a replacement for their own personal effort.

Ethical Consideration of Privacy and Data Security

It is possible to keep students' personal information safe and secure when using AI tools, but of course it requires several key strategies and clear instructions. Schools and teachers should first ensure that students are educated and aware of when and how to sign up on websites for services, and whether it is necessary or not to share sensitive information like credit card details. Along with monitoring data use by regularly review how student use and share their personal data to ensure compliance with privacy agreements educators should provide a list of AI tools that are safe to be used, use specialized applications and software that protect student data and Choose Privacy-Focused AI Tools that collect minimal personal data. The ones that don't require unnecessary personal information (like full names, identification numbers, or addresses) as it reduces the risk of data breaches. provide training to educate students and teachers on the responsible use of their personal data online. Involve ICT teachers and other subjects to spread awareness. In addition to Involve parents in this process to maintain privacy and security, ensuring data is properly guarded.

Considerations

- 1) schools and educators should ensure that the used AI tools by students is being complied to the privacy regulations, along with informing the students how their data is being used

- 2) educate students on how to safely use their personal data online and when to login safely to online websites and provide them with a list of safe AI applications and websites to use
- 3) schools and parents should use specialized applications and software that protect student data and Choose Privacy-Focused AI Tools that collect minimal personal data.

Ethical Consideration of Fairness

Not all students have equal access to technology. Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes. ones can access the paid AI tools other can't offer to pay for it, so they use the free AI tools. along with low-income places they don't have access to the internet all day long. To address this ethical issue. governments and institutions can work together to provide devices, internet access or even build community centers, and free library access with free Wi-Fi. Tech companies could offer discounted or free educational versions of their AI tools. On the other hand, teachers might use offline solutions for students with limited connectivity.

Using AI tools by students might be unfair for high IQ students, if a teacher asked for a high-level quest some students might use AI tools to make this assignment while others will do on their own and some might use it and edit on what they got from the AI tools. SO, the teacher must be fully aware of all the student's different levels of IQ and take it into consideration when giving the students a quest or an assignment.

Additionally, schools can encourage peer learning, where students with access help those without. Blended learning with non-digital assignments can also ensure equitable education, regardless of a student's access to AI tools.

Considerations

- 1) Schools should ensure equality in accessing AI and technology by all the students.
- 2) educators should balance the use of AI tools depending on the IQ of the class students.

Ethical Consideration of Transparency

Most students and educators probably don't fully understand how AI works or makes decisions. This is because AI can be complicated and always on the run and it is being updated regularly. To address this, educators can participate in specialized training to better understand AI concepts. As a result, explain them better to students. Additionally, teachers should explore different AI tools to understand how it works and be fully aware of its uses. Then use practical examples to show students how to extract useful information. Encouraging students to try these tools themselves can help clarify how AI works and make it more accessible.

Considerations

- 1) schools should provide training on how AI works, to ensure that both educators and students understand how AI works.
- 2) Educators should explore different AI tools to understand how it works, So, they can give practical examples for students to show them how to get and extract information's safely from AI.

Ethical Consideration of Teacher's Role

The integration of AI tools in English as a Foreign Language (EFL) education impacts the role of educators in several ways, transforming their responsibilities and teaching approaches, reshaping their role from content delivery to guiding and supporting student learning. It allows teachers to integrate the use of AI to address

different skill levels especially for students with learning challenges, it is like magic as it can get things done with no time, lesson planning in a creative way specially students are really difficult to be impressed, activities, along with finding new resources and strategies.

However, the reliance on AI may lead some students to feel that teachers are less necessary, as they can access information independently. As it raises concern about the teacher's role in maintaining engagement. To address these ethical concerns. Educators should strengthen interactions and relationships and encourage critical thinking. By using AI as a supportive tool instead of a replacement, Continuous professional development will help teachers adapt their roles, ensuring they remain vital in guiding and engaging students.

accountability for AI-related errors that negatively impacts an EFL student's learning writing falls on multiple parties: developers, for the tool's accuracy, educators, for guiding the proper use of AI, students, for verifying AI output, and parents, for monitoring their children's learning and their online activities.

Considerations

- 1) Educators should integrate the use of AI to address different skill levels especially for students with learning challenges,
- 2) Schools should provide professional training for teachers to ensure they remain vital in guiding and engaging students.
- 3) Educators should positively use AI tool as a way to save them time and effort

Ethical Consideration of Accessibility

If a group of students can't access or properly use AI tools, it raises several ethical concerns. It puts fairness and equality at risk, Students without access to AI tools might feel discouraged or unfairly treated compared to peers who can use AI. Creating an unfair learning environment and educational inequality. To address this manner, educators can offer non-AI methods to achieve similar learning outcomes and ensure that no student will feel left behind. Ensuring all students have equal access to learning resources, to prevent widening educational gaps. Like having one day a week (bring your own devices) providing the ones that doesn't have devices with one. or send them to the school lab.

Teachers should be fully aware of how to motivate both students, the ones who use AI tools and the ones who don't use AI tools, to do what is asked from them. As there will be a gap in creating and looking for new and creative ideas between the students who have access with the ones who can't access them.

Teachers should take into consideration the time frame they give students when asking them for any assignment. The students who access the AI will get things done in no time but the ones who don't have the same access will need more time. Teachers should give the students with no access to AI tools more time to do the asked quest from them

Additionally, when schools don't support AI technology, they limit students' opportunities to learn effectively, schools can work toward integrating AI and technology by offering computer labs to ensure technology access for all students. Making the learning experience more equitable and fairer

Considerations

- 1) Schools and educational institutions need to create equitable access to AI tools.
- 2) Schools and educational institutions must establish rules and regulations on the use of AI in assignments and quests to maintain fairness.
- 3) Teachers should have multiple ways to motivate students how uses AI and the ones how write without using AI tools.

Ethical Consideration of Skills development

Students relying on using AI to do tasks for them has become a major concern for educators. As it limits their creativity, critical thinking and writing diversity. To counter this concern, educators should encourage tasks that require generating ideas before using AI tools, fostering a balance between students' personal input and technology, to limit the use of AI in writing, like brainstorming, encourage critical thinking and editing will help students to develop foundational writing skills. To educate students on using the AI tools but not totally relying on it as you can look only for ideas then you write the rest or even teach them paraphrasing and rewriting.

In addition to promoting personalized writing and using AI to enhance and support their writing rather than to take over, like reducing the use of AI only once a week. To balance the use of AI tools with traditional teaching methods

All these strategies can maintain diversity and creativity in their writing styles. These strategies can reduce the negative impacts of AI on writing development

Considerations

- 1) Students should be encouraged by their teachers to generate their own ideas before they rely on AI tools. To encourage brainstorming, critical thinking and editing their own work by their own words and creative ideas.
- 2) Teachers should encourage diversity in the students' writing to engage them actively in the writing process.
- 3) Teachers should encourage students to think independently and critically, while ensuring that AI is used to support, rather than to replace the creative process of the students writing.

4.3 The findings related to question three: What is the effect of using AI technology in writing instruction on EFL writing anxiety?

Based on the results of the one-way ANOVA for repeated measurements, the researcher determined the significance and value of (F) for the differences in means between pre, post, and sequential measurements (the three measurements periods) for the experimental group on the writing anxiety scale.

Table 4-1 Means and standard deviation of Anxiety writing according to measure levels

Measure level	Mean	S. D
Anxiety Writing-1	4.03	1.32
Anxiety Writing-2	3.12	1.46
Anxiety Writing-3	2.07	1.30

Table 4-1 show that there are differences in the averages for the pre, post, and sequential measurements of writing anxiety. To determine the significance of these differences, a one-way Anova was calculated for the repeated measurements shown in Table 4-2.

Table 4-2. One-way repeated measures Anova of Anxiety writing

Measure	Source	test	Sum of square	Df	Means of squares	F	Sig	Eita Square
Anxiety Writing	Within Groups	Sphericity Assumed	16.302	2	8.151	4.998	0.007	0.671
		Greenhouse-Geisser	16.302	1.987	8.205	4.998	0.007	0.671
	Error	Sphericity Assumed	349.031	214	1.631			
		Greenhouse-Geisser	349.031	212.609	1.642			

As shown in Table 2, there are significant differences between the repeated measurements of the writing anxiety scale (pre-post-sequential), with a large effect size (Ellis, 2010). Based on the effect size of 0.67, (67%) of the variance in students' writing anxiety can be attributed to the innovative activities supported by artificial intelligence and designed to improve English as a foreign language writing skill. Table 3 shows the Bonferroni test results for determining the direction of effect size.

Table 4-3. Post Comparisons between Measures levels of Anxiety writing

Differences		Means Differences	Std. Error	Sig
Anxiety Writing-1	Anxiety Writing-2	0.91	0.180	0.001
	Anxiety Writing-3	1.91	0.168	0.00
Anxiety Writing-2	Anxiety Writing-3	1.05	0.174	0.03

A statistically significant difference is found at the significance level (0.05) between the pre- and post-measurements of the level of writing anxiety, with a difference of 0.91 favoring the post-measurement, and between the pre- and sequential measurements, with a difference of 1.91 favoring the sequential measurement. Also, there are statistically significant differences between the post- and sequential measurements, with differences reaching 1.05 in favor of the sequential measurement.

4.4 The findings related to question four: What is the effect of using AI technology in writing instruction on EFL students' writing performance?

Based on the results of the one-way ANOVA for repeated measurements, the researcher determined the significance and value of (F) for the differences in means between pre, post, and sequential measurements (the three measurements periods) for the experimental group on the writing performance test.

Table 4-4. Means and standard deviation of writing performance according to measure levels

Measure level	Mean	S. D
writing performance -1	44.70	8.349
writing performance -2	45.30	8.349
writing performance -3	53.63	7.752

Table 4-4 show that there are differences in the averages for the pre, post, and sequential measurements of writing performance. To determine the significance of these differences, a one-way Anova was calculated for the repeated measurements shown in Table 4-5.

Table 4-5. One-way repeated measures Anova of writing performance

Measure	Source	test	Sum of square	Df	Means of squares	F	Sig	Eita Square
writing performance	Within Groups	Sphericity Assumed	1990.950	2	995.475	38.255	0.00	0.491
		Greenhouse-Ceisser	1990.950	1.307	1523.709	38.255	0.00	0.491
	Error	Sphericity Assumed	2029.717	78	26.022			
		Greenhouse-Ceisser	2029.717	50.959	39.830			

As shown in Table 4-5, there are significant differences between the repeated measurements of the writing performance test (pre-post-sequential), with a large effect size (Ellis, 2010). Based on the effect size of 0.49, (49%) of the variance in students' writing performance can be attributed to the innovative activities supported by artificial

intelligence and designed to improve English as a foreign language writing skills. Table 4-6 shows the Bonferroni test results for determining the direction of effect size.

Table 4-6. Post Comparisons between Measures levels of writing performance

Differences		Means Differences	Std. Error	Sig
writing performance -1	writing performance -2	-0.6	1.270	0.162
	writing performance -3	-8.93	1.386	0.00
writing performance -2	writing performance -3	-8.33	0.608	0.01

A non-statistically significant difference is found between the pre- and post-measurements of the level of writing performance, with a difference of 0.60, however, statistically significant differences were found between the pre- and sequential measurements at the significance level (0.05), with a difference of 8.93 favoring the sequential measurement. Furthermore, there is a statistically significant difference between the post- and sequential measurements, with a difference of 8.33 in favor of the sequential measurement.

CHAPTER FIVE

Discussion and Recommendations

- This chapter includes discussion of the study results and recommendations for future improvements. Research questions and drawn conclusions are discussed separately.

5.1 Discussion related to question one: What are the most effective AI tools for enhancing EFL writing skills?

ChatGPT, Wordtune and Grammarly got chosen by EFL teachers as the most effective AI applications for enhancing EFL writing skills. The findings highlight that AI applications differ in their ability to address writing skills. Yet tools like ChatGPT, Wordtune, and Grammarly were the top-performing AI tools in addressing writing skills. , with ChatGPT ranking first, followed by Wordtune and Grammarly. ChatGPT stood out for its ability to provide the highest rank in all writing skills making it easier to use by teachers and students also with its easy and free friendly version due to EFL teachers opinion.

According to (Rahma & Fithriani, 2024) AI tools is becoming part of the digitized era of education, a lot of artificial intelligence has been created to help students make learning easier, such as Grammarly and Wordtune. Wordtune was highly valued for its rephrasing features as it offers to provide variety of features for rewriting, enabling students to refine their expressions and improve their writing (Zhao, 2022). While Grammarly was highly valued for its grammar checker, and text generation features, which are top priority for crafting clear and original academic content for both teachers and their students. Khalifa and Albadawy (2024).

Teachers of English as a Foreign Language chose ChatGPT, Wordtune, and Grammarly as the best AI tools for enhancing writing skills due to their advanced features designed to meet the needs of diverse learners. As a powerful tool for fostering creativity and critical thinking in writing, ChatGPT excels at contextualized responses, personalized feedback, and interactive learning scenarios. Students benefit from its ability to simulate meaningful conversations and improve grammar, coherence, and style, creating a dynamic and engaging writing environment. EFL educators appreciate the tool's AI-driven adaptability to student proficiency levels.

With Wordtune, you can refine the structure, tone, and clarity of your sentences in an innovative way. Students can learn alternate phrasing and stylistic variations through experimenting with diverse expressions with EFL teachers. In addition to helping students develop fluency, this feature is also beneficial for tasks requiring formal or creative output. The intuitive interface and suggestions for rephrasing make Wordtune a go-to tool for enhancing students' writing.

With its comprehensive grammar-checking capabilities, Grammarly plays a crucial role in addressing common language errors encountered by EFL students. The app is particularly useful for providing immediate, detailed feedback on punctuation, verb usage, and spelling issues, which are common stumbling blocks for non-native speakers. Grammarly's focus on improving readability and suggesting vocabulary enrichment aligns with curriculum objectives for advanced writing. Students can learn and practice consistently across various platforms, which reinforces its effectiveness in the eyes of EFL educators.

ChatGPT has transformed the way EFL students develop their writing skills by offering instant feedback on grammar, sentence structure, and coherence. Unlike traditional

grammar checkers, it provides detailed explanations, helping students understand their mistakes rather than just correcting them. Additionally, ChatGPT assists in idea generation, paraphrasing, and expanding text, making writing more engaging and efficient. With Chat GPT ranking first ChatGPT outperforms Grammarly and Wordtune because it goes beyond grammar correction and sentence restructuring. It helps EFL students with:

- **Comprehensive Writing Assistance** – From brainstorming and drafting to revising and refining.
- **Contextual Understanding** – It provides explanations for corrections, ensuring deeper learning.
- **Creative and Academic Writing Support** – Assists with essays, reports, and creative pieces, not just sentence-level improvements.
- **Interactive Learning** – Allows students to ask questions, get clarifications, and engage in real-time conversations about their writing.

While Grammarly and Wordtune are useful for improving grammar and readability, ChatGPT is a more powerful tool for overall writing development, making it the top choice for EFL students due to teachers point of view.

5.2 Discussion related to question two: What are the ethical considerations surrounding the use of AI in teaching EFL writing instruction for EFL students?

Ethical considerations in plagiarism, technology use, fairness, privacy, and skill development are critical in shaping a balanced integration between the AI and education. By fostering awareness of ethics and the ethical practices, equitable access to

technology and strategies for skill development, educators can create a fair and supportive learning environment. AI tools should be used to enhance learning, ensuring that students develop their own creativity, critical thinking, and originality in writing.

the findings emphasize and highlights the need and importance of addressing students challenges and struggles with the use of AI tools and writing anxiety. Emphasizing ethical practices, equitable access, and skill development can ensure that AI is used to support, not to replace student own effort. As it fosters and encourage creativity, critical thinking, and ethical writing habits while maintain fair in every corner and step in education.

The conclusion emphasizes the need for ethical considerations in integrating AI into education, which is well-supported by recent research. Studies highlight the risks of plagiarism and over-reliance on AI tools, which can undermine students' originality and critical thinking skills if not managed properly. For example, *Abdelfattah et al. (2023)* underline that unchecked AI use may lead to a decline in students' ability to develop independent ideas. Moreover, ethical concerns surrounding data privacy and the fairness of AI algorithms are crucial, as research by *Binns (2022)* shows that biased AI systems may disproportionately affect marginalized communities, thereby exacerbating inequities in education. Addressing these concerns fosters a learning environment where technology supports, rather than hinders, personal and ethical growth.

Equitable access to AI tools and skill development strategies is another critical area supported by educational research. For instance, *Selwyn and Aagaard (2023)* argue that unequal access to AI-powered educational tools can widen the digital divide, leaving disadvantaged students at a greater disadvantage. Developing awareness of ethics among students and educators ensures that AI is used responsibly, as outlined in the

findings of *Holmes et al. (2023)*, which advocate for AI use to empower students to enhance creativity and originality. By combining equitable access, ethical practices, and skill development, educators can create an inclusive and supportive learning environment where AI tools enhance learning outcomes without compromising the integrity of education.

5.3 Discussion related to question three: What is the effect of using AI technology in writing instruction on EFL writing anxiety?

The use of AI technology in writing classes reduces the EFL writing anxiety among students. AI tools can create an environment where young learners can practice their writing with less stress and more confidence. The repetition of using AI innovative activities helps the students improve their writing skills while gradually overcoming their initial fears. Over time, these activities make the writing process easier and more enjoyable, fostering a sense of accomplishment and motivation in the learners. This highlights the potential of AI activities as an effective tool for lighten writing anxiety and support skill development in EFL writing classrooms.

The findings of the study indicate the differences in EFL writing anxiety levels across pre, post, and sequential measurements when using AI technology in writing classes and assignments. These differences suggest that AI tools impacted learners' anxiety levels over time as the study confirmed that the changes in anxiety levels were statistically significant, reflecting the effectiveness of AI applications in reducing writing-related anxiety and stress. This reduction can be attributed to AI innovative activities, instant feedback, which collectively gave confidence and decreased anxiety. These results highlight the potential of AI technology and its innovative activities to

enhance the emotional well-being of EFL learners while improving their writing skills and reducing the EFL writing anxiety for them.

When The educator integrates AI tools to the writing process to help students know their mistakes and enhance their writing, this one point as a way to minimize EFL students' writing anxiety. (Kurniasih & Saukah, 2021).

5.4 Discussion related to question four: What is the effect of using AI technology in writing instruction on EFL students' writing performance?

The integration of AI technology into EFL classes enhances the students performance as it includes the use of inventive approaches, tools, materials, equipment, strategies and activities. This integration is linked to English skills and contributes to reach the anticipated objectives. Pratama and Hastuti (2024). According to Prayudi et al. (2021), The teaching methods educators use inside of their classes plays a major role in facilitating the English language learning. In today's digital era, education has advanced significantly, as AI incorporation is considered one of the main reason

the progression of writing performance was noticed in the findings. While the difference between the pre- and post-measurements did not reach statistical significance, it could be attributed to the students' initial struggle of using the AI tools correctly and efficiently along with the anxiety they might have felt during their first and second attempt to write. However, the significant improvement observed in the sequential measurement indicates as students became more familiar with the use of AI tools and gained more confidence, their writing performance improved. This progression assures the positive effect and the role of using AI tools and technology on reducing anxiety and in enhancing writing skills over time.

The Study Concluded that

- ChatGPT, Wordtune and Grammarly got chosen by EFL teachers as the most effective AI applications for enhancing EFL writing skills.
- Ethical considerations in plagiarism, technology use, fairness, privacy, and skill development are critical in shaping a balanced integration between the AI and education. By fostering awareness of ethics and the ethical practices, equitable access to technology and strategies for skill development, educators can create a fair and supportive learning environment. AI tools should be used to enhance learning, ensuring that students develop their own creativity, critical thinking, and originality in writing.
- AI technology can reduce EFL writing anxiety by providing innovative activities that help children write with less stress each time. As these tools can make writing easier and build confidence, along with supporting skill development.
- The use of AI technology enhanced the student's writing performance.

5.5 Recommendations

- based on the findings There should be applications that prioritize and address the overlooked writing skills in other applications like cohesion and coherence, content and ideas, style and tone, audience awareness, fluency, and cultural awareness.
- Educators should integrate more AI-based writing activities to build familiarity, reduce anxiety, and build students' confidence. Providing training for both students and teachers will enhance effectiveness.

- Encourage the ethical use of AI by ensuring and encouraging students to use them ethically, to enhance their learning process rather than to replace original work and critical thinking
- Integrate the use of AI tools in writing curriculum. For example, create assignments where students can use AI applications for brainstorming ideas, refining grammar, and rewriting sentences, followed by peer reviews and teacher feedback.
- Future research should explore the long-term effects of the AI tools on EFL writing anxiety and writing skills across different proficiency levels. Additionally, studies could investigate how various AI tools impact students' confidence, motivation, and overall writing development in diverse educational settings.

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Appendices

Appendix (1)

Innovative Activities for Improving EFL Writing Skills and Reducing Anxiety Through Artificial Intelligence

Innovative Activities for Improving EFL Writing Skills and Reducing Anxiety Through Artificial Intelligence

Target group: seventh-grade students in private Jordanian schools.

Place: Computer lab.

Educational resources: Install the following application on the school laboratory devices.

ChatGPT Wordtune Grammarly

Ethical Considerations: divided into seven domains

EC1	EC2	EC3	EC4	EC5	EC6	EC7
Plagiarism, Technology and Ethical Standards	Privacy and Data Security	Fairness	Transparency	Teacher's Role	Accessibility	Skills development

Model Stages

1 Preparing stage

provide training workshops for students in the school laboratory on how to use the three AI applications along with training workshops to help students raise their awareness about the seven ethical considerations providing them with real time examples

2 Planning stage

- A short pre-test will divide Students into groups according to their academic writing levels (beginner, intermediate, advanced), ensuring a mix of levels within each group and assigning a leader for each one.

- Each group is asked to use ChatGPT application to select two topics for a writing assignment in English. As They also need to document the sources the application relied on when suggesting the two topics by asking the application to provide the references it used.

-In collaboration with the teacher Each group should organize their chosen topics to ensure diversity and avoid duplication of topics across groups.

-The teacher provides each group with clear instructions on the requirements, the number of paragraphs, and the specific sub-skills to be included in their writing, that contribute to English writing proficiency. The teacher also outlines the needed time to complete the task and highlights that importance of students' collaboration and support one another within each group to enhance their writing

Measures for anxiety-reduction

fostering a sense of reassurance within the group, To ensure that students feel supported by one another for assistance when needed. Additionally, the AI application offers ways for students to seek help when needed if they ever felt shy about asking their group members.

Measures for Ethical Considerations

Students can enhance their skills by using AI applications installed on devices, along with exchanging knowledge and experiences with peers in the same group during the planning phase and topic selection. Additionally, the citation of their work through the AI application when done

Model Stages

3 Implementing Stage

- Teachers ask students to begin writing about the first topic by gathering bullet points related to it. The group will then discuss these ideas, agree on them, and rephrase them logically. Afterwards, the students compare their ideas with the ones generated using ChatGPT.
- The teacher asks the students to develop paragraphs on the topic within a set timeframe by using the logically sequenced points from the previous step. at the same time the teacher provides support to each group and verify that the proper citation is being documented to ensure the ethical considerations. Additionally, the teacher checks the involvement of all group members in the writing process and assesses how effectively the group leader distributes roles transparently
- The teacher asks each group to discuss and check the paragraphs for any grammatical errors by using the AI application Grammarly, as the teacher provides the needed help for each group
- The teacher then asks the students to use the AI application WordTune to check for the accuracy of the written paragraphs and to verify for the validity of grammar in the previous step.
- The teacher allows for each group to discuss and review the written paragraphs and edit based on their own perspective without the use of AI applications, as the teacher provides assistance when needed

Measures for anxiety -reduction

The student can use AI applications to overcome any skill they feel weak in, whether it is related to grammar, sentence and idea coherence, or even generating ideas to overcome the feeling of fear and anxiety

Measures for Ethical Considerations

the final discussion between the group and rephrase the written paragraphs without the use of AI applications prevents plagiarism in addition to citing the written paragraphs to save the copyright of the original author

Model Stages

4 EvaluatingStage

- The teacher begins by checking for plagiarism, and then provide the students in each group for the percentage so they can rephrase to reduce the percentage without the use of AI application
- The teacher asks each group to read the given subject in-front of the other groups to exchange knowledge and experience as it opens a door for discussion and listening to the opinion of others.
- The teacher organizes a quick competition by using one of the applications (Kahoot, Writing Quest with AI) that includes related questions to the subjects that they wrote about. Symbolic prizes will be given to the ones who gives correct answers

Measuresforanxiety-reduction

Creating a motivating and competitive environment based on ongoing encouragement and the continuous feedback

MeasuresforEthicalConsiderations

Check for plagiarism to make sure that students are following the proper limits of citation.

PHASE I: Artificial Intelligence tools in Enhancing EFL Writing Skills
EFL Teachers perspectives (AI tools Card Guid)

***The Description of EFL Writing Skills Component**

EFL Writing Skills Component	usage	components
Grammar	The proper use of sentence structure, punctuation, and the correct way of applying grammatical rules	Tense and voice, sentence structure, punctuation, subject-verb agreement, articles, prepositions, parts of speech, modifiers, etc.
Vocabulary and spelling	Correct spelling and using various words effectively.	Word choice, spelling, word formation, synonyms, antonyms, collocations, Idioms and expressions, homophones and homographs.
Cohesion and Coherence	a well-structured and logically organized text. (connecting ideas smoothly)	Use of linking words and phrases, paragraph structure, topic sentences and transitions. The use of clear and logically organized ideas
Content and Ideas	Conveying ideas clearly	Brainstorming, outlining, supporting arguments, providing evidence, accuracy, Originality, depth, staying on topic.
Organization and structure	Arranging ideas clearly and logically in a well-structured context	Introduction, body paragraphs, conclusion sequencing of ideas, use of headings and subheadings, Sentence structure, paragraph structure, logical flow.
Style and tone	Use variety of writing style and tone to suit the context, purpose, and audience.	Formal vs. informal language, persuasive language, descriptive language, narrative style.
Editing and Revision	Detecting and correcting errors, improving clarity, and enhancing the overall quality of one's work	Proofreading, rewriting, peer review, use of feedback to make changes. Multiple drafts
Audience awareness	Adapting the writing to suit the expectations and needs of the targeted audience.	Understanding the audience's knowledge level, expectations, and interests.
Fluency	Writing naturally and smoothly	Writing practice, free writing exercises, timed writing tasks.
Critical thinking	The ability to analyze and evaluate ideas logically and objectively to make reasoned argument	Argument development, counterarguments, logical reasoning, problem-solving.
Cultural awareness	Understanding and respect for cultural contexts and sensitivities of the targeted audience.	Awareness of cultural references, idiomatic expressions, and context-specific language usage.

****The overall usage of each AI tool= (The sum of the EFL Writing Skills Component assessments) / (100/110)**
Note: Ensure that your result is rounded to the nearest two decimal places

PHASE II
ETHICAL CONSIDERATIONS
SURROUNDING THE USE OF AI IN
TEACHING EFL WRITING SKILLS

Ethical Consideration of Copyright, Technology, and Ethical Standards 1

📄 In the context of EFL writing, how would you utilize AI tools?

📄 What strategies do you use to educate students about copyright?

📄 How can technology be used to teach EFL writing ethically?

Ethical Consideration of Privacy and Data Security 2

📄 Is it possible to keep students' personal information safe when using AI tools?

📄 Are there any steps to keep students' personal information safe, and is it shared without their permission?

Ethical Consideration of Transparency 4

📄 In your opinion, do you think that both students and educators fully understand the process in which AI systems work and make decisions? If not, what can be done to improve that?

📄 As an educator, how would you monitor the AI's decisions to students?

Ethical Consideration of Fairness 3

📄 Do you think that AI tools are fair and equitable for all students?

Ethical Consideration of Teacher's Role 5

📄 In what ways does the integration of AI tools impact the role of EFL educators?

📄 Who is accountable when an AI tool makes an error that negatively impacts an EFL student's learning?

Ethical Consideration of Accessibility 6

📄 What are the ethical considerations if a group of students are unable to access or effectively use these tools?

📄 What ethical considerations arise from the inequality in access to these technologies?

Ethical Consideration of Skills development 7

📄 Are there ethical concerns that the use of AI might hinder the development of critical writing skills in EFL students?

📄 How do you balance the use of AI tools with traditional teaching methods to ensure comprehensive skill development?

Appendix (3)

Writing Performance Exams



First writing Assessment

Topic: Imagine that you're August, write an account about your first day in school.

Requirements: Organize your ideas into three paragraphs as follow

- Paragraph one: How you felt in the morning
- Paragraph two: First impression of school.
- Paragraph three: One memorable encounter that day.

Time: You have 45 minutes to complete your writing

Tips:

- Start by brainstorming ideas or making a short outline.
- Check your spelling, punctuation, and grammar before submitting.



Second Writing Assessment

Topic: describing a fictional word.

Requirements: Organize your ideas into a paragraph to describing a fictional word.

Time: You have 45 minutes to complete your writing

Tips:

- Start by brainstorming ideas or making a short outline.
- Check your spelling, punctuation, and grammar before submitting.



Third Writing Assessment

Topic: describing a future dream job

Requirements: Organize your ideas into a paragraph to describe your future dream job.

Time: You have 45 minutes to complete your writing

Tips:

- Start by brainstorming ideas or making a short outline.
- Check your spelling, punctuation, and grammar before submitting.

Appendix (4)

Writing Performance Rubric

	1 Needs practice	2 Meets Expectations	3 Good	4 Very Good	5 Excellent
Grammar					
Vocabulary and spelling					
Cohesion and Coherence					
Content and Ideas					
Organization and Structure					
Style and tone					
Editing and Revision					
Audience awareness					
Fluency					
Critical thinking					
Cultural awareness					

Score	Description
Excellent	Clear writing, Creative, organized ideas meets all the writing skills expectations proficiently.
Very Good	Clear and organized writing, Good use of the writing skill areas with minor mistakes.
Good	Acceptable writing performance that meets basic requirements and objectives of the writing skills. lacks consistency in some areas.
Needs improvement	Meet expectations, significant gaps in meeting objectives. Requires noticeable improvement and additional effort.
poor	Fails to meet basic writing expectations . the writing lacks effort, quality, or necessary components. Requires major improvements.

Appendix (5)

Foreign Language writing Anxiety Scale

Daly, J. A., & Miller, M. C. (1975). The empirical development of an instrument to measure writing apprehension. *Research in the Teaching of English*, 9, 242-249.

Direction: For each statement, please indicate the degree to which each statement applies to you by checking the box. There are no right or wrong answers to these statements.

Paragraph					
1. I prefer to avoid writing					
2. I have no fear if the teacher wants to evaluate my writing					
3. I look forward to writing down my ideas.					
4. I feel scared when the teacher announces its writing lesson.					
5. I feel nervous and pressured, when I start to work on a composition					
6. I feel that Expressing ideas through writing seems like a waste of time					
7. I feel confident in my ability to Clearly express my ideas through writing					
8. I like to have my friends and family read what I have written.					
9. People seems to enjoy what I write.					
10. I enjoy writing.					
11. I always feel that I would fail the writing assessment.					
12. I feel that Writing is a lot of fun.					
13. Discussing my writing with others is an enjoyable experience.					
14. I don't know how to organize my ideas in a composition assessment.					
15. I know that When I hand in a composition I'm going to do poorly.					
16. It's easy for me to write a good essay.					
17. I don't think I write as good as other students.					
18. I am afraid of writing essays when I know they will be evaluated.					
19. I'm nervous about writing.					

Appendix (6)

Ethical Considerations -First Interview

Questions	1	2
<p>1) Ethical Consideration of Plagiarism, Technology and Ethical Standards.</p>	<ul style="list-style-type: none"> - the students are unaware about the applications that can be used to check for plagiarism. - students are unaware of the ethical and the academic consequences of using someone else's work without proper permission. - Critical thinking - Ethical Use of AI Writing Tools 	<ul style="list-style-type: none"> - to educate students about the applications that can be used to check for plagiarism. - Discuss copyright by educating students about the concept of copyright and the rights of the authors. And help students understand the importance of authenticity - Discuss the ethical and the academic consequences of using someone else's work without proper permission. As the students should have full awareness of what it means that the author has copyright on his work. -Educate students on how to cite sources using basic formats (e.g., Author, Title, Year).and how to cite sources using different citation styles.Consistently conduct workshops on citation.to teach proper citation - Educate students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole assignments for them. - Incorporate Technology into lessons as a way to

Questions	1	2
		<p>brainstorm ideas, to improve sentence structure, or even practice vocabulary.</p> <ul style="list-style-type: none"> - Encourage the students to build their own questions then teach them how to look for it using technology to answer and support what they have already written. To ensure the originality of their own ideas. - Classroom discussion, By regularly talk about plagiarism and why it's important to write original work. - Educate students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole assignments for them. - Incorporate Technology into lessons as a way to brainstorm ideas, to improve sentence structure, or even practice vocabulary.
<p>2) Ethical Consideration of Privacy and Data Security</p>	<ul style="list-style-type: none"> - students are unaware of the consequences to sign in using their personal information -students do not understand the danger of using credit card details online. - parents aren't around to monitor their kids online 	<ul style="list-style-type: none"> -Provide the students with a list of AI tools that are safe to be used - train students on how to safely use AI tools. - monitor data use by regularly review how student use and share their personal data to ensure compliance with

Questions	1	2
	activities	<p>privacy agreements</p> <ul style="list-style-type: none"> - Ensure that the AI tools is applied to privacy laws and institutional policies regarding data protection <p>To educate students when to sign in/up if it is possible to use it without signing to it or when it is needed to purchase a package and share their credit card information.</p> <ul style="list-style-type: none"> - Choose Privacy-Focused AI Tools that collect minimal personal data. The ones that doesn't require unnecessary personal information (like full names, identification numbers, or addresses) as it reduces the risk of data breaches. - Educate Students and Staff about the importance of data privacy and how to protect their own personal information online. This includes understanding what data they are sharing and with whom.
<p>3) Ethical Consideration of Fairness</p>	<ul style="list-style-type: none"> -Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes. - Using AI tools by students might be unfair for high IQ students, 	<ul style="list-style-type: none"> - Not all students have equal access to technology. Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes. - Using AI tools by students might be unfair for high IQ students, if a teacher asked for a high level quest some students might use AI tools to

Questions	1	2
		<p>make this assignment while others will do on their own and some might use it and edit on what they got from the AI tools. SO teacher must be fully aware of all the students different levels of IQ and take it into consideration when giving the students quest or an assignment.</p>
<p>4) Ethical Consideration of Transparency</p>	<p>-Most students and educators probably don't fully understand how AI works or makes decisions.</p> <p>- students and teachers aren't trained enough</p>	<p>- Provide training for educators by specialist so they can better explain AI to their students.</p> <p>- as an educator to try more than on AI tool to understand how it works and be fully aware of its uses, and show the students directly examples on ow to get information out of AI tools. then ask the students to try it out</p>
<p>5) Ethical Consideration of Teacher's Role</p>		<p>- Teachers shift from content delivery to guiding and supporting student learning.</p> <p>- it affects the role of the teacher inside of the classroom as the students might feel the teacher as an extra or a waste of their time as they can look any need information using AI.</p> <p>-The teacher might integrate AI tool to build confidence in students with learning challenges</p> <p>- Developers, educators and students their selves are responsible when AI tool makes an error that negatively impacts an EFL student's learning</p>

Questions	1	2
<p>6) Ethical Consideration of Accessibility</p>	<p>-fairness and Equity - Educational Inequality - unsupported institution:</p>	<p>-fairness and Equity: Ensuring all students have equal access to learning resources, to prevent widening educational gaps.</p> <p>- Educational Inequality: Students without access to AI tools may fall behind.</p> <p>- unsupported institution: The schools who doesn't support the use of AI tools and technology</p>
<p>7) Ethical Consideration of Skills development</p>	<p>- Decrease Critical thinking and creativity: Depending on AI to create ideas weakening their ability to write independently and critically</p> <p>-Reliance on AI: Students might rely on AI tools for grammar, sentence structure, and even to create ideas potentially weakening their own writing skills and creativity.</p>	<p>To balance the use of AI tools with traditional teaching methods</p>

Appendix (7)

Ethical Considerations -Second Interview

Questions	1	2
<p>1)Ethical Consideration of Plagiarism, Technology and Ethical Standards.</p>	<p>- Students are unaware of the authentic ways to take any information from online resource.</p> <p>- the students are unaware about the applications that can be used to check for plagiarism.</p> <p>- Students are unaware about copyright</p> <p>- student doesn't know how to cite the information's they get from any source.</p>	<p>- by regularly doing lectures and training's to keep students updated and train them about plagiarism and the authentic ways to take any information from online resource.</p> <p>- to encourage student re-state what they have took from any resource using their own language.</p> <p>- to educate students about the applications that can be used to check for plagiarism. By takings samples from their work and show them how these tools can detected.</p> <p>- Educate students about the concept of copyright and the rights of the authors.</p> <p>- To take samples from their own work and present it in-front of everyone without using their names, then putting other names on them form them to see how inconvenient and unpleasant it feels for anyone to take your own work and be credit for.</p> <p>-teach students how to cite sources using different citation styles.and always practice with them the proper citation</p> <p>Educate students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole assignments for them.</p>

Questions	1	2
	Ethical Use of AI Writing Tools and technology	- Incorporate Technology into lessons as a way to brainstorm ideas, to improve sentence structure.
2) Ethical Consideration of Privacy and Data Security	<p>- parents aren't around to monitor their kids online activities</p> <p>- students are unaware of the consequences sharing their personal information or how to keep their personal data secured and protected</p> <p>Ethical consideration when shopping online and sharing the credit card information</p>	<p>- include parents. And take their permission to use AI tools and educate them on how to keep their kids personal data safe</p> <p>- Educate students how not to share any private information to raise there awareness on keeping there personal data</p> <p>Involve computer teachers and other subjects to spread awareness.</p> <p>- monitor data use by regularly review how student use and share their personal data to ensure compliance with privacy agreements.</p> <p>- To educate students when to sign in/up if it is possible to use it without signing to it or when it is needed to purchase a package and share their credit card information.</p>
3) Ethical Consideration of Fairness	- Using AI tools by students might be unfair for high IQ students,	- Using AI tools by students might be unfair for high IQ students, if a teacher asked for a high level quest some students might use AI tools to make this assignment while others will do on their own and some might use it and edit on what they got from the AI tools. SO teacher must be fully aware of all the students different levels of IQ

Questions	1	2
	<p>Not all students have equal access to technology. Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes.</p>	<p>and take it into consideration when giving the students quest or an assignment.</p> <ul style="list-style-type: none"> - Schools to provide low-income students with the necessary devices, like laptops or tablets, and reliable internet access. Public libraries or community centers can offer free access to technology as well.
4) Ethical Consideration of Transparency	<p>Most students and educators probably don't fully understand how AI works or makes decisions.</p>	<ul style="list-style-type: none"> - To educate educator on all the aspects of AI and to try them out before showing the students any AI application - Provide training for educators by specialist so they can better explain AI to their students.
8) Ethical Consideration of Teacher's Role	<p>Teachers underestimate the useful point of integrating AI in teaching</p> <p>Teachers are blamed if the AI tool made an error that negatively impacts an EFL student's learning</p>	<p>it is like magic as it can get things done with no time, lesson planning in a creative way specially students are really difficult to be impressed, activities, along with finding new resources and strategies. Etc...</p> <ul style="list-style-type: none"> - Developers, educators and students their selves are responsible when AI tool makes an error that negatively impacts an EFL student's learning. Trainings should be offered to both teachers and students so they can better understand how AI tools works

Questions	1	2
<p>9) Ethical Consideration of Accessibility</p>	<p>-fairness and Equity</p> <p>- motivational inequality: as the students who cant access the AI will fell down and might lose their self confidence due to the motivation for the ones who get things down because they used the AI tools and technology</p> <p>- Educational Inequality and prior knowledge</p> <p>Creativity and ideas</p> <p>-Time frame:</p>	<p>- fairness and Equity: Ensuring all students have equal access to learning resources,to prevent widening educational gaps. Like having one day a week (bring your own devices) or send them to the school lab.</p> <p>- motivational inequality:Teachers should be fully aware on how to motivate both students the ones who uses AI tools and the ones who doesn't use AI tools to do what is asked from them.</p> <p>- Educational Inequality: Students without access to AI tools may fall behind. students who have access to the AI might have more information than the ones who cant access the AI.</p> <p>Schools to provide low-income students with the necessary devices, like laptops or tablets, and reliable internet access. Public libraries or community centers can offer free access to technology as well.</p> <p>Creativity and ideas: their will be a gap in creating and looking for new and creative ideas between the students who have access with the ones who cant access them.</p> <p>Time frame: the students who access the AI will get things done with no time but the ones who doesn't have the same access will need more time.teachers should give the students with no access to AI tools more time to do the asked</p>

Questions	1	2
		quest from them
7)Ethical Consideration of Skills development	<p>- Decrease Critical thinking and creativity</p> <p>-Reliance on AI</p> <p>-less diversity in writing</p>	<p>To educate students on using the AI tools but not totally relaying on it as you can look for ideas and you write the rest or even teaching them paraphrasing and rewriting.</p> <p>- Not to use AI tools until the students fully understand of how to write and know the writing skills fully.</p> <p>- To cut the use of AI only once a week.</p> <p>- Supervision from the educators is requested so they can make sure that the students don't fully relay on using AI all the time.</p> <p>- To integrate the use of AI on steps for example on the first semester in a certain grade to integrate the use if AI 10% next semester 20% and so on.</p>

Appendix (8)

Ethical Considerations -Third Interview

Questions	1	2
<p>1) Ethical Consideration of Plagiarism, Technology and Ethical Standards.</p>	<ul style="list-style-type: none"> - the consequences of plagiarism - students are not educated on how Citation works -Critical thinking: -Ethical Use of AI Writing Tools: 	<p>It is well know that Plagiarism occur when using someone else's work, ideas, or projects, and presenting them as their own., this can involve copying from sources, using someone else's ideas without credit, or editing on it. Several strategies can be done to educate students about plagiarism.starting by using examples to illustrate and explain what plagiarism is, then Introduce plagiarism detection tools to help students check their own work for originality. Teach them how to properly cite sources using different citation styles, and emphasize the ethical importance of rephrasing ideas using their own words while building on them. Additionally, making sure to discuss the consequences of plagiarism, including the academic and ethical consequences of using someone else's work or ideas without proper credit. As this approach fosters responsible and ethical writing habits.</p>

Questions	1	2
<p>2) Ethical Consideration of Privacy and Data Security</p>	<ul style="list-style-type: none"> - keep students' personal information safe when using AI tools - the use of credit data - unsafe AI tools and websites 	<p>It is possible to keep students' personal information safe and secure when using AI tools, but of-course it requires several key strategies and clear instructions. Schools and teachers should first ensure that students are educated and well aware on when and how to sign up on websites for services , and whether it's necessary or not to share sensitive information like credit card details. Educators should provide a list of AI tools known to be safe, use specialized applications and software that protect student data, and provide training on the responsible use of their data online. It is essential to Involve parents in this process to maintain privacy and security, ensuring data is properly guarded.</p> <p>Educate students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole</p>

Questions	1	2
		<p>assignments for them. As to write their own script then use one of the AI tools to help them enhance their work. Teachers should Incorporate Technology into lessons as a way to brainstorm ideas, to improve sentence structure, or even practice vocabulary, encouraging students to build their own questions then teach them how to look for it using technology to answer and support what they have already written. To ensure the originality of their own ideas</p>
<p>3) Ethical Consideration of Fairness</p>	<p>- Equality in accessing AI and technology</p>	<p>Not all students have equal access to technology. Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes. ones can access the paid AI tools other cant offer to pay for it so they use the free AI tools. along with low income places they don't have access to the internet all day long. To address this ethical issue. governments and institutions can work together to provide devices, internet access</p>

Questions	1	2
		<p>or even build community centers ,and free library access with free Wi-Fi. Tech companies could offer discounted or free educational versions of their AI tools. On the other hand teachers might use offline solutions for students with limited connectivity. Additionally, schools can encourage peer learning, where students with access help those without,</p> <p>Blended learning with non-digital assignments can also ensure equitable education, regardless of a student’s access to AI tools.</p>
<p>4) Ethical Consideration of Transparency</p>	<p>- Most students and educators probably don't fully understand how AI works or makes decisions</p>	<p>Most students and educators probably don't fully understand how AI works or makes decisions. This is because AI can be complicated and always on the run and it is being updated regularly. To address this, educators can participate in specialized training to better understand AI concepts. As a result explain them better to students. Additionally, teachers should explore</p>

Questions	1	2
		<p>different AI tools to understand how it works and be fully aware of its uses. then use practical examples to show students how to extract useful information. Encouraging students to try these tools themselves can help clarify how AI works and make it more accessible.</p>
<p>10) Ethical Consideration of Teacher's Role</p>	<ul style="list-style-type: none"> - to consider that the role of teachers are less necessary - accountability for AI-related errors 	<p>The integration of AI tools in English as a Foreign Language (EFL) education impacts the role of educators in several ways, transforming their responsibilities and teaching approaches, reshaping their role from content delivery to guiding and supporting student learning.</p> <p>It allows teachers to integrate the use of AI to address different skill levels especially for students with learning challenges,</p> <p>However, the reliance on AI may lead some students to feel that teachers are less necessary, as they can access information independently. As it raises concern about the teacher's role in</p>

Questions	1	2
		<p>maintaining engagement. To address this ethical concerns. Educators should strengthen interactions and relationships and encourage critical thinking. By using AI as a supportive tool instead of a replacement, Continuous professional development will help teachers adapt their roles, ensuring they remain vital in guiding and engaging students.</p> <p>accountability for AI-related errors in learning EFL writing falls on multiple parties: developers, for the tool's accuracy, educators, for guiding the proper use of AI, students, for verifying AI output, and parents, for monitoring their children's learning and their online activities.</p>
<p>11) Ethical Consideration of Accessibility</p>	<p>- fairness and Equity</p> <p>- Educational Inequality</p> <p>- unsupported institution: The schools who doesn't support the use of AI tools and technology</p>	<p>If a group of students can't access or properly use AI tools, it raises several ethical concerns. It puts fairness and equality at risk, Students without access to AI tools might feel discouraged or unfairly treated compared to peers who can use AI. Creating an unfair learning</p>

Questions	1	2
		<p>environment and educational inequality. To address this manner, educators can offer non-AI methods to achieve similar learning outcomes and ensure that no student will feel left behind.</p> <p>Additionally, when schools don't support AI technology, they limit students' opportunities to learn effectively, schools can work toward integrating AI and technology by offering computer labs to ensure technology access for all students. Making the learning experience more equitable and fair</p>
<p>12) Ethical Consideration of Skills development</p>	<ul style="list-style-type: none"> -Decrease Critical thinking and creativity -Reliance on AI - less diversity in writing 	<p>Student relying on using AI to do tasks for them has become a major concern for educators. As it limits their creativity, critical thinking and writing diversity. To counter this concern, educators should encourage tasks that require generating ideas before using AI tools, fostering a balance between students personal input and technology, to limit the use of AI in writing, like brainstorming, encourage critical thinking and editing</p>

Questions	1	2
		will help students to develop foundational writing skills. In addition to promoting personalized writing and using AI to enhance and support their writing rather than to take over, can maintain diversity and creativity in their writing styles. These strategies can reduce the negative impacts of AI on writing development

Appendix (9)

Ethical Considerations -Qualitative Content Analysis

Questions	1	2
<p>2) Ethical Consideration of Plagiarism, Technology and Ethical Standards.</p>	<ul style="list-style-type: none"> - the consequences of using someone else's work without proper permission. - the students are unaware about the applications that can be used to check for plagiarism. - students are not educated on how Citation works -Critical thinking: -Ethical Use of AI Writing Tools: 	<p>It is well known that Plagiarism occur when using someone else's work, ideas, or projects, and presenting them as their own., this can involve copying from sources, using someone else's ideas without credit, or editing on it. Several strategies can be done to educate students about plagiarism. Starting by using examples to illustrate and explain what plagiarism is, then Introduce plagiarism detection tools to help students check their own work for originality. Educate students on how to cite sources using basic formats (e.g., Author, Title, Year).and how to cite sources using different citation styles. Consistently conduct workshops on citation.to teach proper citation. Discuss copyright by educating students about the concept of copyright and the rights of the authors. And help students understand the importance of authenticity and emphasize the ethical importance of rephrasing ideas using their own words while building on them. Additionally, making sure to discuss the consequences of plagiarism, including the academic and ethical consequences of using someone else's work or ideas without proper credit. As this approach fosters responsible</p>

Questions	1	2
		<p>and ethical writing habits. While Educating students on the ethical use of AI writing assistants like ChatGPT, Google ... etc. Emphasizing that these tools should only be used to enhance their writing skills, not to complete whole assignments for them. To encourage student re-state what they have took from any resource using their own language. On a regular basis classroom discussion should be implemented , to talk about plagiarism and why it's important to write ones original work. Incorporate Technology into lessons as a way to brainstorm ideas, to improve sentence structure, or even practice vocabulary.</p>
<p>2) Ethical Consideration of Privacy and Data Security</p>	<ul style="list-style-type: none"> - keep students' personal information safe when using AI tools - the use of credit data - unsafe AI tools and websites 	<p>It is possible to keep students' personal information safe and secure when using AI tools, but of-course it requires several key strategies and clear instructions. Schools and teachers should first ensure that students are educated and well aware on when and how to sign up on websites for services , and whether it's necessary or not to share sensitive information like credit card details. Along with monitoring data use by regularly review how student use and share their personal data to ensure compliance with privacy agreements Educators should provide a list of AI tools that are safe to be used, use specialized applications and software that</p>

Questions	1	2
		<p>protect student data and Choose Privacy-Focused AI Tools that collect minimal personal data. The ones that doesn't require unnecessary personal information (like full names, identification numbers, or addresses) as it reduces the risk of data breaches.</p> <p>, provide training to educate students and teachers on the responsible use of their personal data online. Involve ICT teachers and other subjects to spread awareness. In addition to Involve parents in this process to maintain privacy and security, ensuring data is properly guarded.</p>
<p>3) Ethical Consideration of Fairness</p>	<ul style="list-style-type: none"> - Equality in accessing AI and technology - Using AI tools by students might be unfair for high IQ students, 	<p>Not all students have equal access to technology. Students from low-income families, may face barriers to using AI tools, leading to disparities in educational outcomes. ones can access the paid AI tools other cant offer to pay for it so they use the free AI tools. along with low income places they don't have access to the internet all day long. To address this ethical issue. governments and institutions can work together to provide devices, internet access or even build community centers ,and free library access with free Wi-Fi. Tech companies could offer discounted or free educational versions of their AI tools. On the other hand</p>

Questions	1	2
		<p>teachers might use offline solutions for students with limited connectivity.</p> <p>Using AI tools by students might be unfair for high IQ students, if a teacher asked for a high level quest some students might use AI tools to make this assignment while others will do on their own and some might use it and edit on what they got from the AI tools. SO teacher must be fully aware of all the students different levels of IQ and take it into consideration when giving the students quest or an assignment.</p> <p>Additionally, schools can encourage peer learning, where students with access help those without. Blended learning with non-digital assignments can also ensure equitable education, regardless of a student's access to AI tools.</p>
<p>4) Ethical Consideration of Transparency</p>	<p>- Most students and educators probably don't fully understand how AI works or makes decisions</p> <p>- students and teachers aren't trained enough</p>	<p>Most students and educators probably don't fully understand how AI works or makes decisions. This is because AI can be complicated and always on the run and it is being updated regularly. To address this, educators can participate in specialized training to better understand AI concepts. As a result explain them better to students. Additionally,</p>

Questions	1	2
		<p>teachers should explore different AI tools to understand how it works and be fully aware of its uses. then use practical examples to show students how to extract useful information. Encouraging students to try these tools themselves can help clarify how AI works and make it more accessible.</p>
<p>13) Ethical Consideration of Teacher's Role</p>	<ul style="list-style-type: none"> - teachers role are considered to be less necessary - accountability for AI-related errors -Teachers underestimate the useful point of integrating AI in teaching 	<p>The integration of AI tools in English as a Foreign Language (EFL) education impacts the role of educators in several ways, transforming their responsibilities and teaching approaches, reshaping their role from content delivery to guiding and supporting student learning. It allows teachers to integrate the use of AI to address different skill levels especially for students with learning challenges, it is like magic as it can get things done with no time, lesson planning in a creative way specially students are really difficult to be impressed, activities, along with finding new resources and strategies.</p> <p>However, the reliance on AI may lead some students to feel that teachers are less necessary, as they can access information independently. As it raises concern about the teacher's role in maintaining engagement. To address this ethical concerns.Educators should strengthen interactions and relationships and encourage critical thinking.</p>

Questions	1	2
		<p>By using AI as a supportive tool instead of a replacement, Continuous professional development will help teachers adapt their roles, ensuring they remain vital in guiding and engaging students.</p> <p>accountability for AI-related errors that negatively impacts an EFL student's learning writing falls on multiple parties: developers, for the tool's accuracy, educators, for guiding the proper use of AI, students, for verifying AI output, and parents, for monitoring their children's learning and their online activities.</p>
<p>14) Ethical Consideration of Accessibility</p>	<ul style="list-style-type: none"> - fairness and Equity - Educational Inequality - unsupported institution: The schools who doesn't support the use of AI tools and technology -motivational inequality -Creativity and ideas: -Time frame 	<p>If a group of students can't access or properly use AI tools, it raises several ethical concerns. It puts fairness and equality at risk, Students without access to AI tools might feel discouraged or unfairly treated compared to peers who can use AI. Creating an unfair learning environment and educational inequality. To address this manner, educators can offer non-AI methods to achieve similar learning outcomes and ensure that no student will feel left behind. Ensuring all students have equal access to learning resources, to prevent widening educational gaps. Like having one day a week (bring your own devices) providing the ones that doesn't have devices</p>

Questions	1	2
		<p>with one. or send them to the school lab.</p> <p>Teachers should be fully aware on how to motivate both students the ones who uses AI tools and the ones who doesn't use AI tools to do what is asked from them. As their will be a gap in creating and looking for new and creative ideas between the students who have access with the ones who cant access them.</p> <p>Teachers should take into consideration the time frame the give students when asking them for any assignment. The students who access the AI will get things done with no time but the ones who doesn't have the same access will need more time. teachers should give the students with no access to AI tools more time to do the asked quest from them</p> <p>Additionally, when schools don't support AI technology, they limit students' opportunities to learn effectively, schools can work toward integrating AI and technology by offering computer labs to ensure technology access for all students. Making the learning experience more equitable and fair</p>

Questions	1	2
<p>15) Ethical Consideration of Skills development</p>	<p>-Decrease Critical thinking and creativity</p> <p>-Reliance on AI</p> <p>- less diversity in writing</p>	<p>Student relying on using AI to do tasks for them has become a major concern for educators. As it limits their creativity, critical thinking and writing diversity. To counter this concern, educators should encourage tasks that require generating ideas before using AI tools, fostering a balance between students personal input and technology, to limit the use of AI in writing, like brainstorming, encourage critical thinking and editing will help students to develop foundational writing skills. To educate students on using the AI tools but not totally relaying on it as you can look only for ideas then you write the rest or even teaching them paraphrasing and rewriting.</p> <p>In addition to promoting personalized writing and using AI to enhance and support their writing rather than to take over, like reducing the use of AI only once a week.To balance the use of AI tools with traditional teaching methods</p> <p>All of these strategies can maintain diversity and creativity in their writing styles. These strategies can reduce the negative impacts of AI on writing development.</p>