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Department of English
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**Investigating the Impact of Artificial Intelligence (AI)
Tools on EFL Students' Critical Thinking in
Academic Writing
Case of 3rd Year Students at Tlemcen University**

**Dissertation Submitted to The Department of English as a Partial
Fulfilment of The Requirements for Master's Degree in Didactics of
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Declaration

We hereby declare that this dissertation is the result of our own original work and has not been submitted previously, in whole or in part, for the award of any degree or qualification at this or any other institution. All sources of information and quotations from other authors have been duly acknowledged. I confirm that the current work is free from any form of plagiarism and is the result of our own research, unless stated otherwise.

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Dedication 1

It is with warm regard that I dedicate this work to all my family members especially, my beloved parents may Allah protect them, my adorable sisters, my dearest brother, and finally, to all my friends.

Ms Settouti Nesrine Amel

Dedication2

I dedicate this work to my dear parents, my lovely sister and brother, my cousin, and finally, to all my friends for their constant encouragement and support as well as their help in my studies throughout these five years.

Ms. Mellouk Ahlem

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Abstract

Writing is considered one of the most essential skills in language learning, serving as a foundational medium through which learners articulate their thoughts and ideas. This study investigated the quality of academic writing among English as a Foreign Language (EFL) students in relation to their use of Artificial Intelligence (AI) tools, with a particular focus on how these tools influence students' critical thinking. The research was conducted with third-year EFL students at Tlemcen University during the 2024–2025 academic year. Employing a triangular approach, the study utilized both written tests and interviews to gather data for qualitative and quantitative analysis. The findings revealed that while AI tools can enhance EFL students' academic writing performance, their misuse may hinder critical thinking skills development. The results also emphasized the importance of AI literacy as a mitigating factor. By the end of this research, some recommendations and suggestions were presented for the sake of integrating AI literacy into the academic curriculum and the promotion of ethical guidelines to ensure responsible and effective use of AI technologies in educational contexts.

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List of Acronyms

AI: Artificial Intelligence

AISS: AI-Supported Scaffolding System

CWP: Comprehension Writing Production

EFL: English as a Foreign Language

GE-AI: Generative Artificial Intelligence

HOTS: Higher-Order Thinking Skills

IOS: iPhone Operating System

NLP: Natural Language Processing

SRL: Self-Regulated Learning

ZPD: Zone of Proximal Development

GENERAL INTRODUCTION

General Introduction

The assimilation of AI tools in academic writing has triggered a large debate and brought up important concerns, with a particular view on their effects on EFL students' critical thinking skills. While technology is increasingly incorporated in instructional practices, these AI tools provide hopeful benefits such as reinforcing writing performance, instant feedback, and assistance for language learning. For instance, a study by Liu and Wang (2024) reports a significant testimony that AI tools can enhance critical thinking skills among Chinese EFL learners in literature classes by supporting scaffolded learning, facilitating engaging learning experiences, offering prompt and tailored feedback. However, other studies point out that taking for granted these technologies may accidentally impede the development of essential critical thinking skills. For instance, a study was conducted in Albania by Celaet *al* (2024) highlights that the overuse of AI in education can weaken critical cognitive skills. One example of this is reliance on AI-powered solutions which lowers students' critical engagement with the course content. Therefore, it is necessary for educators and researchers to investigate the duality of AI tools and especially in the field of EFL academic writing. In the same vein, the present study aims to explore whether the use of AI-based writing assistants enhance EFL students' critical thinking or inadvertently hinder their abilities to engage critically with their writing tasks.

An analysis of how these technologies impact the critical thinking process can provide a deeper understanding of their potential advantages and disadvantages. This, in turn, can inform the effective integration of AI into language education. This investigation will not only inform teaching practices but also empower EFL students to harness AI tools in a way that complements and enhances their critical thinking abilities rather than undermining them. In conclusion, while AI tools present opportunities for improving writing efficiency and providing support, it is crucial to approach their integration thoughtfully, ensuring that they serve as catalysts for critical engagement rather

than crutches that hinder the development of analytical skills essential for academic achievement.

To better understand this dynamic, the present study focuses on exploring the impacts of AI-based tools on EFL students' critical thinking in writing at Tlemcen University, where students are actively engaging with both traditional language learning methods and emerging technologies.

In this regard, three research questions are formulated:

1. How EFL teachers perceive the impact of AI tools on students' critical thinking in academic writing?
2. What limitations and drawbacks might AI tools present for EFL students' critical thinking skills in their academic writing?
3. How fostering AI literacy among EFL teachers and learners can enhance these benefits on students' critical thinking in academic writing and minimize the drawbacks?

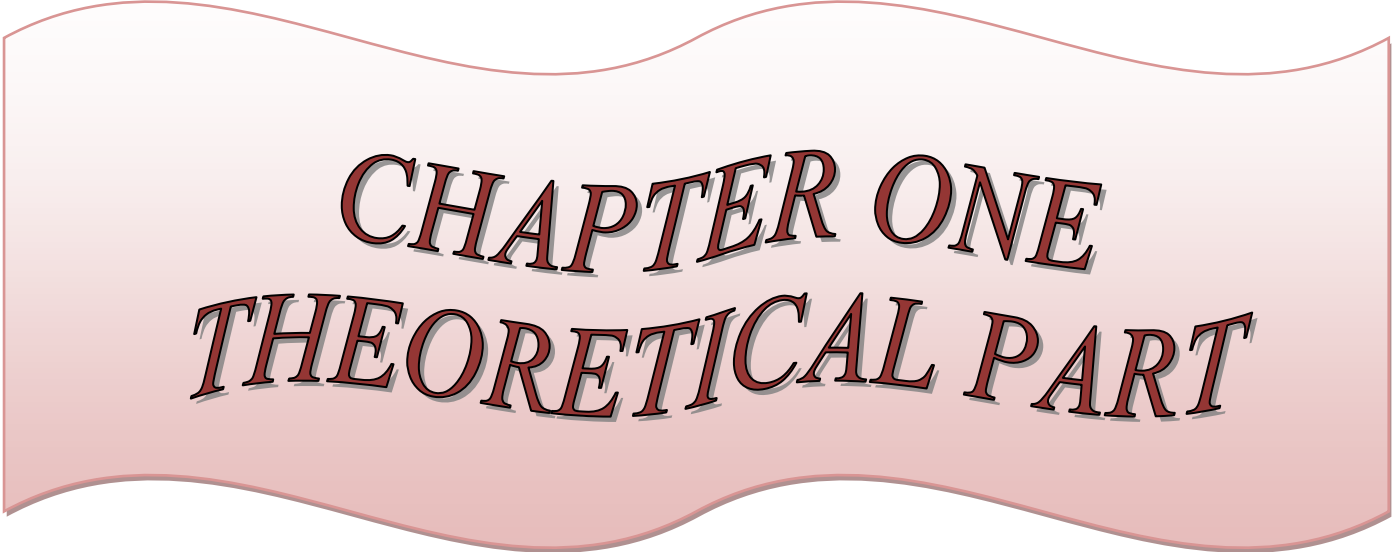
The above mentioned questions give rise to the following hypotheses:

1. EFL students and teachers may perceive that AI tools positively influence students' critical thinking in academic writing while simultaneously believe that excessive reliance on these tools may hinder independent thought and creativity.
2. AI tools may represent a number of limitations such as providing information without context, leading to misunderstandings or a lack of depth in students' comprehension of the subject matter.
3. Fostering AI literacy among EFL teachers and learners may maximize the benefits of AI tools in academic writing and minimize their drawbacks by equipping learners with the skills to critically evaluate AI-generated content and integrate it effectively into their learning processes.

In order to test these hypotheses and answer the above mentioned questions, a triangulation method was adopted including an interview and a test. The interview addresses English teachers of comprehension writing production

(CWP), the interview aims at understanding teachers' perspectives on the impact of AI tools on EFL students' critical thinking in academic writing .While the test (traditional test and AI assisted-test) was employed among third year English students in the university of Tlemcen, intended for testing the quality of students' critical thinking in academic writing with and without the use of AI tools. This multiplication of data sources and instruments requires a mixed- method approach to data analysis, combining qualitative interviews and quantitative tests to ensure gathering relevant information that aligned with the research questions and hypothesis .

The present dissertation is structured into two main chapters, focusing on the theoretical and practical aspects. The first chapter focuses on an extensive examination of the literature, including identification of the role of critical thinking in academic writing, particularly for EFL students. It begins by defining critical thinking and its core components and then highlights its importance in academic writing. The section then introduces AI tools used in academic writing, categorizing them by function. In addition, it examines how AI can both support and hinder the development of students' critical thinking in academic contexts, underlining some challenges that can be encountered due to the use of AI. Finally, it is concluded with certain guidelines that emphasize the significance of AI literacy for students' academic writing. The second chapter centers the practical aspect that underscores gathering and analyzing data, using an interview with English teachers of comprehension writing and production for the purpose of acquiring teachers' perspectives about the impact of AI tools on EFL students' critical thinking in academic writing. In addition to a test addressed to third year students to assess the quality of their academic writing with and without the use of AI. At the end, this chapter discusses the limitations that the researchers faced during the study and offers recommendations aiming at guiding students in the responsible use of AI, ensuring it support rather than undermines the development of critical thinking in academic writing.



CHAPTER ONE *THEORETICAL PART*

Chapter One: Theoretical Part

1.1. Introduction

AI has brought a lot of changes to the educational sector, more particularly to the field of academic writing. The first chapter covers the theoretical part of this research study. It aims to present and discuss the most significant academic works that were intended to shed light on the field of academic writing. This chapter provided first an overview about the growing presence and functions of AI technologies in educational settings, with particular attention to writing support tools. The review then investigates how these tools influence the development of EFL students' critical thinking skills, highlighting AI as a cognitive scaffold in addition to the potential challenges students may face when using these tools. Finally, this review is concluded by some guidelines that highlight the importance of AI literacy for EFL students and teachers, in addition to its impact on the development of students' academic writing, emphasizing the role of teachers in guiding students to navigate the best use of AI tools and avoid its potential risks.

1.2. Critical Thinking in Academic Writing

Critical thinking in academic writing refers to the ability to engage in reflective and independent thinking aiming to synthesize information and arguments to form logical conclusions. This involves questioning assumptions, assessing the reliability of sources and considering multiple perspectives to deepen understanding. The application of critical thinking to academic writing is expressed through the process of argumentation, producing an argument with its evidence i.e. an essay. Arguments can be defined as the primary expression of critical thinking in higher education (Andrews 1995, Scott 2000). Writing and thinking are inter-connected. The study of Rahmat (2020) explored the connection between thinking and writing. Figure 1 shows the cycle of thinking and writing. Effective writing involves thorough planning, this planning process includes reading to gather information. During this stage, critical thinking skills

are engaged to assess the content of the article, its relevance, and how the contents fit into the writers' needs. The writer understands that the initial draft is not the final product, while he must critically review and evaluate his own work to enhance the final version.

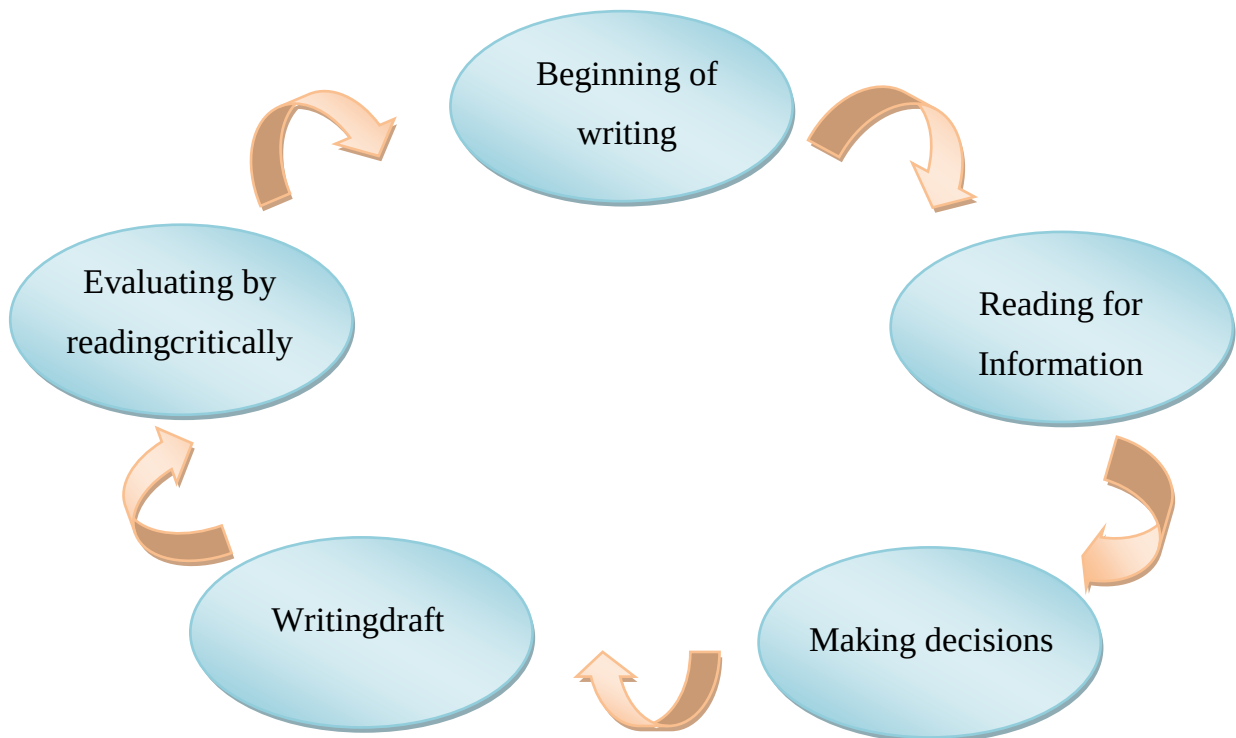


Figure 1.1The Cycle of Thinking and Writing (Adapted from Rahmat 2020)

1.2.1 The Definition of Critical Thinking

In broad terms critical thinking is viewed as a cognitive skill related to the rational judgment, defined as “the educational cognate of rationality” (Siegel 1988 in Jones 2005). It means that critical thinking is the form or version of rational and logical thinking within the field of education. It implies that critical thinking represents the educational expression or application of rational thought, serving as a key intellectual skill cultivated through instructional practices and learning processes. According to Toulmin and al (1984 in Andrews 2000, p.5) critical thinking is often associated with reasoning which is “the central activity of presenting reasons in support of a claim”. It encompasses the delicate analysis, evaluation, and reflection. Reasoning as a fundamental aspect of critical thinking, involves the logical processes of

drawing conclusions from premises, whether through deductive or inductive methods.

A valuable framework for cultivating these skills is Bloom's Taxonomy that outlines a hierarchy of cognitive processes that supports critical engagement with academic material.

Bloom's Taxonomy (1956) categorizes cognitive skills into six levels: Remember, Understand, Apply, Analyze, Evaluate and Create. These levels progress basic recall of information to the generation of new ideas, aligning closely with the development of critical thinking abilities. In academic writing, this framework encourage students to move beyond memorization and comprehension, guiding them to apply knowledge, analyze concepts, evaluate arguments and ultimately create original work . Bloom's Taxonomy was employed as an illustrative framework to enlighten the concept of critical thinking.

1.2.2. Key Components of Critical Thinking

Critical thinking is a fundamental element in academic writing, enabling students to analyze information, construct arguments, and engage with content at a deeper level .It is often described as a meta-cognitive process, consisting of number of sub-skills (e.g. analysis, evaluation, inference) that their appropriate use, increases the chances of producing logical conclusions to an argument or solution to a problem. As said by Paul & Elder (2006) "Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing and evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action."

The components of critical thinking are of paramount significance in improving higher-order cognitive skills necessary for academic success. This is particularly more important for EFL learners who must navigate linguistic and cognitive demands. According to Facione (1990), critical thinking involves a purposeful and self-regulated process that includes interpretation, analysis,

evaluation, inference and explanation, all grounded in evidential and conceptual foundations. This comprehensive definition highlights the vital components that emphasize the development of critical thinking skills in academic writing.

1.2.2.1. Interpretation

Interpretation is a fundamental component of critical thinking, integrating the ability to comprehend and articulate the meaning of significance of various forms of information. In the view of critical thinking expert (Facione, 1990.p6) interpretation involves, “comprehending and expressing the meaning or the significance of a wide variety of experiences, situation, data, events, judgment, conventions, beliefs, rules, procedures or criteria.” This skill enables individuals to make sense of complex information, discern underlying meaning and communicate their understanding effectively. In academic writing, especially for EFL students, interpretation is essential for analyzing texts and constructing coherent arguments, and by enhancing that skill students can navigate academic discourse, contribute original insights, and demonstrate a deeper level of comprehension in their writing.

1.2.2.2. Analysis

Analysis represents a fundamental dimension of critical thinking, encompassing the systematic examination of ideas and logical relationships between them. Based on the findings of the expert panel in The Delphi Report book (1990), analysis is “to identify the intended and the actual inferential relationships among statements, questions, concepts, descriptions or other forms of representation to express belief, judgment, experiences, reasons, or opinions.” (Facione 1990, p 6). This definition emphasizes that analysis involves a critical investigation of the logical relationships among different elements of reasoning, thereby enabling individuals to comprehend the structure and coherence of arguments. This skill enables EFL students to break down complex ideas into consistent part and understand the relation between them. As well, it fosters deeper engagement with texts and arguments, promotes the ability to organize evidence and evaluate the information critically.

1.2.2.3. Evaluation

Evaluation is a pivotal aspect of critical thinking ,encompasses the systematic assessment of information and arguments to determine their validity and relevance. According to Bray & Boon (2011 .p101) titled a Framework for Research Career Development, evaluation involves “the application of reason and judgment based on existing and newly acquired knowledge”. It emphasizes that critical thinking not only possessing knowledge but about actively applying logic and thoughtful judgment to analyze, evaluate and make informed decisions in academic and research contexts.

1.2.2.4. Inference

Inference is a fundamental component of critical thinking, referring to the process of drawing logical conclusions from available information and prior knowledge. The previous definition highlights that inference involves connecting the dots between known and deductive new insight, an essential skill for interpreting data, understanding implications, and making reasoned judgments. “Inferences are conclusions you come to. It’s what the mind does in figuring something out.”Elder &Paul,(2009). For EFL students, improving inferential abilities enhances reading comprehension and enables the constriction of evidence-based arguments in academic writing.

1.2.2.5. Explanation

Explanation is a key component of critical thinking that entails the coherent and logical articulation of the reasoning process supporting one’s conclusions, judgments or beliefs. As the concept was defined by Facione (1990, p.7) “to state the results of one’s reasoning ; to justify that reasoning in terms of evidential, conceptual, methodological, criteriological and contextual consideration upon which one’s result were based ; and to present one’s reasoning in the form of cogent arguments”. For EFL students, fostering this skill enables them to enhance their way of convincing, using coherent arguments related to valid evidence.

1.2.2.6. Self-Regulation

Self-regulation as a higher-order component of critical thinking entails the reflective capacity to monitor, evaluate or adjust one's cognitive processes to enhance reasoning and decision-making. According to Paul and Elder (2002), critical thinking is characterized as “self-directed, self-disciplined, self-monitored, and self-corrective thinking”. This definition underscores that self-regulation encompasses a deliberate and reflective approach of thinking. For EFL students, this skill empowers them to critically assess their arguments, recognize potential bias, and make necessary revisions to strengthen their work.

According to Cottrell (2005) and Ennis (1996), to effectively assess the quality of students' academic writing, it is essential to evaluate their work based on key components of critical thinking such as clarity of arguments, relevance of evidence, depth and logic flow of ideas, appropriate language and style, and the presence of unique and original perspectives. Clarity of arguments refers to how clearly and precisely ideas are expressed in academic writing, clear arguments help reader understand the writer's position and reasoning (Cottrell 2005). Relevance of evidence ensures that the supporting details, examples and references used directly related to the main arguments or question. Including only pertinent evidence strengthens the credibility and the focus of writing (Cottrell 2005). Depth and logic flow ideas involves exploring issues critically from multiple angles rather than offering surface-level observations. Logic flow ensures ideas are organized coherently and follow a clear progression, supporting critical thinking engagement. (Ennis 1996; Cottrell 2005) . Appropriate academic language and style contribute original insights, rather than relying solely on external source. This includes correct grammar, precise vocabulary, and a formal tone suited to academic contexts (Cottrell 2005). Unique perspective and Originality reflect the writers' ability to critically reflect and contribute original insights, rather than relying solely on external sources. Originality is a key sign to higher-order thinking and intellectual independence (Ennis 1996).

The core components of critical thinking are fundamental cognitive skills that contribute significantly to the development of academic reasoning. When these components function jointly, they empower EFL students to produce coherent, well-structured and critically informed academic writing.

1.2.3 Definition of Academic Writing

Academic writing is a formal style of writing that is used in scholarly contexts, such as universities and research publication. According to Neil & Hughes (2008, p. 17) “academic writing is evidence-based objective, and formal in tone, aiming to communicate ideas clearly and logically within a scholarly context.” This definition explains that this type of writing is characterized by a clear focus on a specific topic or research question. Moreover, it follows established conventions of structure, language and citation, while it seeks to convey complex ideas in a logical, objective, and coherent manner. Any style of writing processed through various stages, each stage is demonstrated and practiced, from selecting suitable sources, reading, note-making and planning through to re-writing and proof-reading. Academic writing emphasizes originality and integrity requiring writers to properly attribute sources and avoid pressing someone else’s work, while plagiarism has become a major concern in higher education, and a special feature of academic writing, in a section of avoiding this issue. There are also units on the key skill of paraphrasing, summarizing and referencing.

1.2.4 The Importance of Critical Thinking in EFL Students’ Academic Writing

The development of critical thinking skills plays a pivotal role in improving the quality of academic writing among EFL students. As it enables them to analyze information, construct logical arguments and express original viewpoints. Academic writing is not only transferring information; it requires critical engagement and logical thinking to evaluate and synthesize diverse perspectives. According to Ennis (1996.p166), critical thinking involves “reasonable, reflective thinking focused on deciding what to believe or do.” Based on this finding, it empowers EFL students in engaging thoughtfully with

the content and making reasonable decisions. Critical thinking is a skill that directly influences the quality of academic writing. Furthermore, a search by Stapeton (2002) highlights that critical thinking develops students' ability to build logical arguments and support them with evidence, which is the core expectation of academic writing. Thereby critical thinking allows students to analyze complex ideas into coherent arguments using logic and reasons as evidence, regardless of memorization and copying.

1.2.5 Common Challenges EFL Students Face in Developing Critical Thinking Skills

In the context of (EFL) education, the development of critical thinking skills has become increasingly essential, particularly in academic writing where students are expected to analyze and synthesize information. However, despite its significance, EFL students often face numerous obstacles in acquiring and applying these skills. These challenges emphasize linguistic limitations, cultural factors, and pedagogical practices such as:

a. Limited Language Proficiency

It is a significant obstacle that EFL students face in developing their critical thinking skills, while many students struggle with vocabulary, grammar, and sentence structure, automatically this affects the ability to comprehend and express complex texts, evaluate arguments and engage with academic content. For instance, a study by Phuy (2024) highlights that EFL students struggle with critical thinking in academic writing due to their limited language proficiency. Based on the finding of this research, students encounter challenges in expressing complex ideas and engaging in analytical tasks that are closely attached to their language limitations.

b. Cultural and Educational Background

Cultural and educational background has a great significance in shaping how EFL students approach critical thinking, particularly in academic writing. In many EFL contexts, traditional education systems prioritize rote memorization; obedience to authority, and knowledge reproduction rather than

analytical, logical reasoning and open-ended inquiry .So, many students may enter higher education with limited experiences in analyzing complex ideas and synthesizing information. According to Atkinson (1997, p.72) “critical thinking is deeply rooted in Western cultural traditions and may not easily align with the learning expectation or norms of students from non-Western educational background.”.As the quote demonstrates that students’ cultural background can significantly influence their ability to engage in critical thinking, particularly when educational traditions differ from critical thinking components.

c. Cognitive Overload

Cognitive overload represents as a significant challenge that EFL students face in enhancing their critical thinking skills. It occurs when the amount of information a person is trying to process exceeds the capacity of their working memory. In other words, it is when the brain is asked to handle too much at once making it difficult to focus, understand, or retain information .This is especially common in a learning environment, where students might be handling new concepts, new language, or complex tasks at the same time . As the case of EFL students, cognitive overload can occur because they are trying to understand academic content and doing so in a new language, this double effort, processing both language and content can overwhelm their working memory and hinder deeper critical engagement. As Shehab (2014) notes, “overloading learners’ working memory makes learning difficult”, emphasizing the significance of minimizing cognitive load to facilitate effective learning.

d. Low Confidence and Motivation

Low confidence and motivation are commonly referred to as psychological factors in language learning and education. These factors can significantly affect EFL student’s critical thinking development, EFL students who lack confidence in their language proficiency often hesitate to participate and articulate their own perspectives in the classrooms, which are fundamental to the practice of critical thinking. In the same vein, a lack of motivation frequently results in decreasing engagement with cognitively demanding tasks,

such as analyzing complex texts, or constructing well-reasoned arguments. As Alarabai (2014) observes, “low self-confidence and lack of motivation can negatively affect students’ willingness to communicate and learn”. Based on this observation, these psychological factors play a crucial role in the learning process; otherwise their negative influence can significantly hinder the development of students’ critical thinking skills.

Based on the previous information, it is obvious that enhancing critical thinking skills is essential for EFL students, despite all the obstacles they face, it is important for them to engage in overcoming these obstacles in order to improve their learning and personal growth in general.

1.3. Introduction to AI Tools

In recent years, AI has emerged as a transformative power in different fields all over the world. It has radically changed how people think, communicate and work by influencing their both personal and professional lives. According to the European Commission (2024) AI system is:

"A machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments."

This definition highlights the various tasks that AI tools are able to accomplish aiming to help people in their daily lives. A seemingly different view of AI was given by Microsoft where it is described as a computer system’s ability to imitate intelligence and behaviors of humans. This perspective shows that AI tools, algorithms and techniques try to simulate human cognitive functions such as generating content, recognizing patterns, solving problems and tasks with impressive rapidity and accuracy rate. In today's world, AI is present and used in various fields, increasingly in the education sector. While the whole teaching and learning process is significantly impacted by the existence of such tools in

teachers and students' digital devices, one area is quietly but profoundly influenced which is academic writing.

1.3.1. AI Tools in Academic Writing

Writing academic texts is a complex task, especially for non-native English speakers like EFL students. It requires not only a thorough understanding and knowledge about the subject-matter but also a high level of accuracy, reliability and validity. It is difficult for EFL students to write with academic style and structure, provide clear and convincing evidence and maintain a coherent and logical flow of their ideas. These challenges have made AI tools of significant importance nowadays. Helping writers in refining and editing their works by correcting grammar and spelling mistakes, adjusting the structure and tone of the writing making it fit the academic style and can also help in collecting huge amounts of information rapidly by suggesting relevant sources. As noted by Inside Higher Ed (2023), "AI writing tools, when used appropriately, can empower students to write more clearly, think more critically, and manage their time more effectively." This highlights that when AI is integrated carefully by students into their writing process, it has the potential to enhance not only the technical quality of writing, but also critical thinking and time management skills. It helps students in developing more efficient and reflective writing habits.

1.3.2. Types of AI-Powered Writing Tools

There is a huge variety of AI-powered writing assistants that can be used by students in accomplishing their writing tasks. Although they share some common features and goals, each tool has a specific function to perform differently from the other. These functions can be divided into five types as follows:

1.3.2.1. Structure and grammar correction tools

The primary function of this type of tool is to automatically detect and correct grammar mistakes, spelling and punctuation errors in the provided text.

It also provides explanations of grammar rules aiming to develop student's writing skills over time.

There is a famous and widely used digital writing assistant platform which offers such a function called "Grammarly". It is designed to help writers enhance their writing by analyzing their text and checking for grammar, spelling, punctuation and sentence structure errors. One of the strong points of this tool is offering correction suggestions according to the writers' writing objectives, making it the ideal platform for students when writing academic texts with formal tone and style. Dizon and Gold (2023) explored the effects of Grammarly on EFL students' foreign language on learner autonomy in a Japanese University. The research findings showed that students had positive perceptions toward Grammarly as an English writing tool and the latter in return had a significant positive effect on students' writing autonomy and skills.

Grammarly is available in various forms, as a web-based editor, as desktop application for both Windows and Mac, as a browser extension and as mobile application for both Android and Iphone Operating System (IOS) devices. This platform is available in both free and premium versions. The premium version includes all the features included in the free version with a high level of accuracy in addition to some advanced features such as genre-specific writing style (academic, business, friendly, etc.).

1.3.2.2. Content Generation Tools

Content Generation tools assist writers with brainstorming, creating and suggesting ideas and generating content for writing about any topic in any field. It has the capacity to produce full-length content such as essays, articles, emails, social media captions, etc. It also helps in organizing thoughts and answering questions with reliable answers in any domain.

ChatGPT (Generative Pre-trained Transformer) is considered one of the most popular platforms that generate content. It is primarily a web based platform available on "chat.openai.com". It has different versions mainly based on AI models being used and new features added, some of them are free and

others premium. Generally speaking, ChatGPT refers to an advanced AI Chabot that helps writers in generating ideas, writing efficient and well-structured essays, emails and captions on social media rapidly fitting with the tone and writing style requested. According to a recent publication in Data Intelligence by MIT Press “In the realm of education, ChatGPT can be leveraged to create personalized learning experiences for students... by facilitating dialogues and providing responses to their questions.” This demonstrates how ChatGPT can act as a flexible learning aid that instantly adapts to the changing needs of students.

1.3.2.3. Paraphrasing tools

Paraphrasing tools are designed to help writers to rewrite text using different words while keeping the same meaning and ideas in that text. Paraphrasing tools are generally used to avoid plagiarism while citing a quote or taking texts from articles or books. These tools offer a new structure of the original ideas avoiding repetition of the same vocabulary and sentence structure making the text provided looks original, easier to understand and accurate.

Among paraphrasing tools, QuillBot AI-powered writing platform is well known for its paraphrasing features. It helps in rewriting text keeping the original meaning and tone while changing the vocabulary used and sentence structure with the ability to shorten and expand the length of the text as depending on the need. QuillBot is available primarily as a website (www.quillbot.com) and also as a chrome extension. It has both, the free and premium versions. While the free version has a limited paraphrasing word count up to 125 words per input only in English language, the premium version has a higher word limits up to 6000 words per input in several languages, including Spanish, French, German and more with access to 7 paraphrasing modes including formal, shorten, creative, etc.

1.3.2.4. Quotation and Reference Suggestion Tools

It helps writers in adding accurate and reliable quotations and references to their works quickly. It has the ability to provide a large number of credible

quotations about a specific topic and even find direct quotations the writer is looking for in a specific book or article. It helps in generating references in different formats such as APA, MLA, Harvard, etc. In addition to providing any missing reference details such as date, author name, title when some details are known. Another function this type of tools can offer is generating a bibliography or reference list by collecting all the sources used in a provided text

Zotero is an open-source tool designed to help students and researchers not only to collect and automatically save citation information from various sources but also generate and organize references in thousands of styles (APA, MLA, Chicago, etc.) into collections and sub-collections.

Zotero is free to download and use for its main features. The premium version has only one additional feature which is extra cloud storage, making the free version usually enough. Zotero is mainly an application that can be installed on computers and mobiles, but it is also available as a website and browser extension

1.3.2.5. Plagiarism Detection Tools

Plagiarism Detection tools analyze texts and pieces of writing to identify similarities and the parts copied from other sources without proper credit. In order to ensure the originality of the texts provided, plagiarism detection tools check some items among them similarity, paraphrase and citation checking to make sure that the input text does not contain similar content with other databases without proper credit .

Quetext is a famous online plagiarism detection tool used by students and teachers; it shows the percentage of text that might be plagiarized. It scans the text and highlights with red the word by word similarities and with yellow the possible paraphrased parts. In addition, it allows clicking on highlighted text to instantly see the original source from the internet side-by-side. It has a freemium model with basic features and the premium version (Quetext Pro)

with some extra features, such as larger text limits (up to 25,000 words per search).

1.3.3. AI's Role in Writing Assistance and Language Learning

AI plays an important role in developing and helping students, especially non-native students, to improve their writing skills. There are many different platforms, such as those mentioned above, that provide various services aiming to enable the user to write an error-free, original, understandable and academically acceptable text. AI not only develops writing skills but the whole language learning process. A mixed-methods study was conducted by Fathi et al. (2024) investigated the effectiveness of AI-assisted learning and its role in enhancing international Chinese as a second language students' academic writing. The study findings reported that AI-assisted learning significantly improved students' academic writing performance by helping them to identify and correct errors, as well as inspiring them and helping them refine their expressions. Additionally, the participants reported positive learning experiences, as they showed increased motivation and reduced anxiety when using AI tools. These perceptions highlight the contribution of AI-assisted tools to enhancing learners' academic writing motivation and skills. AI-powered platforms like Duolingo and Babbel use adaptive algorithms to provide personalized guidance and adaptive lessons by analyzing individual needs and tailoring instruction accordingly. These platforms are able to suggest targeted exercises, vocabulary lists, and writing tasks base on students' weaknesses and lacks, making the learning process more efficient and motivating.

1.3.4. The Challenges of Using AI Tools in Academic writing

According to the Nature Editorial Board (2023), "While AI tools offer novel support for academic writing, their use challenges traditional expectations of authorship, critical engagement, and scholarly responsibility." This quote suggests that while AI tools provide endless support in academic writing, their usage is not without challenges. To make the best use of these tools, students must navigate its potential issues and challenges, including possible lack of accuracy, reliability, originality and critical thinking, in addition to a risk of

dependency. Understanding these challenges is important to using AI tools properly and maintaining the integrity of academic writing. AlAfnan *et al.* (2023) highlighted in the article “Artificial intelligence-powered tools and academic writing: to use or not to use ChatGPT.” that the challenges that students may face while using AI can be categorized, as outlined below:

1.3.4.1. Lack of Accuracy and Reliability

While academic writing requires a high level of accuracy and precision, AI-generated content can sometimes provide false information and fabricated content and references. These “hallucinations” which do not actually exist may lead to undermining the quality and credibility of your work.

1.3.4.2. Originality and Plagiarism Concerns

Academic writing is known for containing original ideas and content. However, the inappropriate use of AI tools raises concerns in maintaining this originality. Sometimes it provides too closely similar content to an already existing text on the internet, raising concerns about plagiarism.

1.3.4.3. Dependency Risk

Excessive use of AI tools may lead to an overreliance on them. As a result, the development of several and essential cognitive and academic skills may be negatively impacted, such as critical analysis, argument construction, and scholarly writing abilities.

1.3.4.4. Lack of Critical Thinking and Depth

AI tools are able to provide facts and information about any specific topic. However, these tools often struggle to generate deep analysis with arguments, critical evaluations, or nuanced insights.

1.4. The relationship between AI tools and critical thinking in academic writing

The relationship between AI tools and critical thinking in academic writing is complex and multifaceted. While AI tools offer numerous services and help for students in editing and refining their academic texts, misuse or over-reliance on these tools may hinder the cognitive skills of students such as

critical thinking. This dualistic relationship between AI tools and critical thinking in academic writing has triggered a nuanced debate between researchers.

The integration of AI technologies into English writing settings was investigated by Liu *et al.* (2023), with an emphasis on encouraging learners' meta-cognitive engagement and reflective practices. According to Liu *et al.* (2023), students are motivated to evaluate their way of thinking, challenge presumptions, and improve their writing techniques by incorporating reflective prompts and feedback loops into AI-supported systems. This study shows that the integration of such AI-driven reflective mechanisms which suggest alternative perspectives and counterarguments and encourage students to engage more deeply with their subject matter, have the capacity to effectively enhance higher-order thinking skills, by serving as supportive collaborators in the writing process.

The research findings of a study by Octaberlina *et al.* (2024) revealed that AI can threaten the development of an individual's critical thinking skills, as over-reliance on such tools hinder active engagement in the process of thinking, reflecting, and inhibiting creativity. This study highlights the potential harm that these tools may bring to students, such as laziness, a lack of independent thinking and decline in self-editing skills. An article entitled "Academic Communication with AI-Powered Language Tools in Higher Education: From a Post-Humanist Perspective" (2024) explored the dual nature of AI tools on academic writing and revealed that students' interactions with AI-powered language tools are shaped by their personal instructional repertoire, i.e., the impact of AI technologies on academic writing is mediated by institutional frameworks and instructional approaches.

1.4.1. AI as a Cognitive Scaffold for Higher-Order Thinking Skills

Academic success in the modern world requires a set of higher-order thinking skills (HOTS), which include creativity, critical thinking, problem-solving, and meta-cognition. These abilities allow students to analyze, assess, and produce knowledge. AI is being explored as a possible cognitive scaffold,

i.e., a technology that can direct support, and enhance learners' cognitive abilities, as education increasingly embraces digital revolution. The concept of cognitive scaffolding is rooted in Vygotsky's Zone of Proximal Development (ZPD), which allows learners to accomplish more complicated activities with assistance. AI, with its adaptable, responsive, and tailored capabilities, is now set to provide such scaffolding dynamically.

In a study by Kim et al. (2022), researchers developed an AI-Supported Scaffolding (AISS) system that uses Natural Language Processing (NLP) to analyze student writing. The research findings revealed that students helped by AISS showed notable improvements in critical reasoning and clarity, as their written arguments were logical and coherent. Another similar study was conducted by Lee et al. (2024), investigated ChatGPT's integration in blended learning settings, with a focus on how the AI interface's guidance mechanisms affect self-regulated learning (SRL). The study findings showed stronger meta-cognitive techniques, better knowledge building, and an increased capacity for learning reflection by students who received directed AI support. These two studies show AI's ability to function as a powerful cognitive scaffold in real-time. It can transform passive learners into active and independent thinkers, guiding them through their ZPD.

1.4.2. The Risks of AI Dependency among EFL Students

AI tools provide obvious benefits. However, they also represent major concerns when used excessively or incorrectly. One of the most significant concerns is that overreliance on AI tools may hinder the natural language acquisition process. Students may prefer AI to generate or correct their work, instead of actively engaging in the tasks. This passive participation limits possibilities for meaningful practice, which is essential for the learning process. In addition, when EFL students rely too heavily on AI to accomplish their work, they risk missing out on developing their own ideas and arguments.

Moreover, students, who rely on AI in every language challenge, may doubt their own abilities and become hesitant to think or write without AI assistance. A study at Central University of Ecuador conducted by Rodríguez

Bermeo *et al.* (2024) explored the impact of AI on students' ability to work independently suggested that there is a correlation between overreliance on AI and a loss confidence in student's ability to complete tasks without the assistance of technology. i.e., the less confident a student has in his skills, the more likely he is to overuse AI tools to obtain good-quality work.

1.5 Artificial Intelligence (AI) Literacy in the Digital Age

AI literacy has emerged as a critical competency; it refers to the ability to understand, critically evaluate, and effectively interact with AI technologies. Scholars such as Long and Magerko (2020) emphasize that AI literacy extends beyond programming knowledge to include understanding AI's capabilities, limitations, and potential bias. For instance Long and Megerko (2020.p2) claim that: “It is a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace”. AI technologies are composed of various algorithms, which are the core mechanism that enables machines to perform tasks. In the digital age, these algorithms influence the information people receive, the services they access, and even their personal choices. For instance, machine learning, a major subset of AI, relies heavily on these algorithms to refine its models based on new data inputs. However, it is crucial to discern the latent images of these algorithms, as they may pose significant risks to human health and cognitive functioning.

1.5.1 AI Literacy in Education

AI technologies have transformed many industries including education. As AI has only erupted in the last few years, it is necessary that students learn about it. AI literacy has been suggested as a way of defining competencies for students about the new intelligence. It requires a blend of conceptual knowledge, technical skills, and socio-ethical understanding. Stolpe&Hallastrom (2024, p.6) claim that “AI literacy extends beyond technical skills to include conceptual knowledge and socio-ethical understanding”. Drawing upon a framework tailored from models of technology education, AI literacy encompasses more than the basic definition and understanding of

artificial intelligence; it also involves the improvement of technical competencies such as programming, computational thinking, and data literacy. Furthermore, it underscores the necessity of cultivating critical thinking skills regarding the ethical, social, and environmental implications of AI technologies. Within the educational contexts, AI literacy should aim to equip students with the ability to engage thoughtfully with technological tools, comprehend the underlying mechanism of AI systems, and critically assess their broader impact on society.

1.5.2 The Importance of AI Literacy for EFL Students and Teachers

The transformative potential of generative artificial intelligence (GeAI) in language education highlights the importance of AI literacy among EFL students and teachers to ensure their ethical and effective integration into the academic fields.

a. The Importance of AI Literacy for EFL Students

Hossain (2023. p.1) defines AI literacy simply as the ability to identify, understand, develop ideas, and critically evaluate AI technologies, their application, and ethical implications. Building on Hossain's definition, AI literacy was represented as students' familiarity, knowledge, and ethical perceptions of AI. The familiarity domain refers to the degree of affinity of students with AI in general and in EFL education. While the knowledge domain focuses on how often and to what extent students use AI specifically in learning, AI literacy empowers EFL students to critically assess the reliability and limitations of the sources, striving to escape plagiarism and use these technologies effectively. This is particularly crucial when AI tools are used to assess language, as errors or cultural misrepresentations may go unnoticed with critical awareness.

b. The Importance of AI Literacy for EFL Teachers

Generative AI has been applied in various ways to support language education; it has the potential to revolutionize language education by providing innovative tools and approaches to enhance language learning and teaching. It is

essential for teachers to understand AI literacy, since it equips them with the knowledge and necessary skills to effectively integrate AI tools into their teaching practices. For instance, Integrating AI into lesson planning and teaching practices is revolutionizing education by enhancing efficiency, personalization, and pedagogical innovation. AI-powered tools assist educators in designing customized lesson plans that cater to diverse students' needs, saving time and improving instructional quality. As Karpouzis et al. (2024) describes a generative AI tool that enables teachers to input specific classroom details such as student demographics, learning objectives, and preferred teaching styles to generate lesson plans. This approach not only streamlines the planning process but also fosters inclusive and adaptive learning environments.

1.5.3 The Impact of AI Literacy on Academic Writing

AI literacy can significantly enhance students' academic writing, especially in the digital age. As AI-powered writing assistants become more relevant, such as ChatGPT, Grammarly, and Quillbot, AI literacy empowers students with the familiarity of using these tools without eroding academic integrity. Furthermore, AI literacy equips students to understand how AI generates content, recognize its limitations and biases, and evaluate the credibility of AI-generated suggestions. This cultural awareness permits students to gather valid and relevant information from AI tools for their academic writing. AI literacy enables students to navigate ethical challenges that can be raised by AI in writing, such as plagiarism and over-reliance on automated writing. According to SabrinHabib (2024), "AI can assist in brainstorming, summarizing complex ideas, and even structuring arguments, but if it replaces rather than refines students' intellectual engagement, its use becomes problematic." This highlights the importance of AI literacy in ensuring that students utilize AI to improve their learning and writing process without compromising academic integrity.

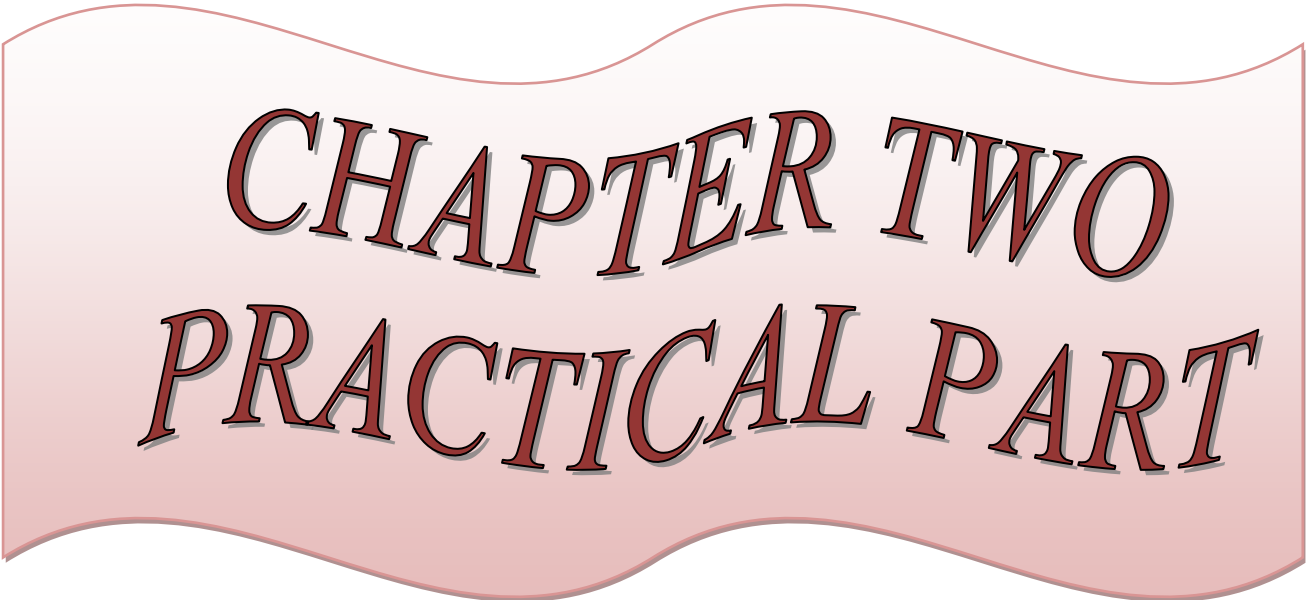
1.5.4 The Teachers' Role in Developing Students' AI Literacy

As AI has begun to integrate into all aspects of daily life, the challenge of better preparing students to employ it effectively and efficiently in teaching

has become an essential issue. The rise of knowledge based on AI technology education means that every learner should have the basic competencies of 'intelligent literacy'. Teachers' role includes fostering students' understanding about how AI systems operate, guiding them to critically evaluate AI's social impact, and promoting responsible usage. According to Ng, Leung, and Chu (2021, p.118), "teachers serve as key mediators in cultivating AI literacy by connecting technological content with real-world contexts and ethical implications". Ng, Leung, and Chu assert that teachers hold a crucial position in fostering AI literacy by acting as intermediaries who bridge technical instruction with broader social and ethical considerations this perspective underscores the importance of educators not only imparting fundamental knowledge about AI but also contextualizing this knowledge with real-world application and moral.

1.6 Conclusion

The current literature review proved that the impacts of AI tools on EFL student's critical thinking in academic writing is a thorny issue including several perspectives and different aspects to be taken into account. The previous cited studies suggest that the effectiveness of AI in promoting critical thinking largely depends on how these tools are integrated into pedagogical practices. Thus, educators play a critical role in shaping how AI is framed and utilized in academic writing instruction. In this regard, fostering AI literacy among students becomes essential. EFL learners need not only technical familiarity with AI tools but also critical awareness of their appropriate applications in academic contexts. By creating clear guidelines and encouraging appropriate use, educational institutions may embrace AI's teaching potential while still encouraging autonomous thought.



CHAPTER TWO

PRACTICAL PART

CHAPTER TWO: PRACTICAL PART

2.1. Introduction

This chapter is devoted to the description of a case study concerning the impacts of AI tools on students' critical thinking in their academic writing. A mixed-method research design was employed, combining both qualitative and quantitative approaches to help obtain relevant results. To achieve the study's objectives, two primary data collection instruments were used. First, qualitative data were obtained through semi-structured interviews conducted with CWP teachers. Second, a Writing test was administered to a sample of EFL students to collect quantitative data about their critical thinking performance in writing with the assistance and absence of AI tools. Finally, the collected data were subjected to an analysis. Quantitative data from the students' Writing tests were statistically analyzed to identify trends and differences, while qualitative data from the interviews were thematically analyzed to extract recurring ideas and insights. Through the combination of both analyses of the gathered data, the proposed hypotheses will be confirmed or rejected.

2.2. Research Methodology

A thoughtful choice of a research design is a crucial step as it serves as a blueprint for the entire research study. The selected research design has to align with research objectives not only to ensure the validity and reliability of research findings but also to provide worthwhile contributions to the field of study (Creswell & Creswell, 2018). The present study adopted an exploratory research design; the latter is defined by George (2021) as such: "exploratory research is a methodology approach that investigates research questions that have not previously been studied in depth". This definition explains that exploratory research focuses on studying topics that have not been deeply examined before, aiming to gain new insights.

2.3. Research Objectives

Research objectives play a crucial role in shaping and guiding any research process. They help highlight areas of focus, and ensure that the study remains aligned with its main purpose. In the context of this study, which explores the impact of AI tools on students' critical thinking skills in their academic writing, three important objectives have been formulated:

1/ exploring teachers' and students' perceptions about the impact of AI tools on students' critical thinking in academic writing.

2/Analyzing the advantages and drawbacks that AI tools may have on students' critical thinking in their academic writing.

3/ Proposing pedagogical strategies to maximize benefits and minimize drawbacks.

2.4. Sample Population

Sampling is a crucial aspect in the data collection process. According to Creswell (2014), sampling refers to the selection of a number of individuals from a broader population with the aim of representing the characteristics of the larger whole. The present study was conducted with third-year University students enrolled in the Department of English at Abou-BakrBelkaidTlemcen University. The theoretical list of third-year students in the English department contains around 300 students; however, this number is subject to regular updates by teachers. The students are organized into six separate groups. Out of the existing six groups, two groups were selected randomly to participate in this research. As far as the teachers are concerned, the researchers reached out to seven CWP teachers at Tlemcen University, but only five of them agreed to take part in the interview.

This type of selection is called simple random sampling. It was used to ensure that each group had an equal chance to participate, aiming to minimize selection bias and enhance the representativeness and objectivity of the selected sample population. As it was defined by Kothari (2004, p.60)“simple random

sampling is a sampling method in which each item in the population has an equal chance of being included in the sample”.

The selected type of sampling is enrolled in a broader category named probability sampling paradigm. Babbie (2010, p.188) explains "Probability sampling involves the selection of a sample from a population based on the principle of randomization, ensuring that each element has an equal or known probability of being selected". This definition shows that this paradigm is based on random selection of a sample allowing researchers to make generalizations to the larger population, maximizing in this way the reliability of the study.

The main reasons for selecting this sample are that third year students are expected to have developed a certain level of academic writing due to their exposure to different writing tasks throughout their first and second academic years. Additionally, students at this level are more likely to have built up a range of critical thinking skills which make them suitable for the present research topic. Finally, third year students are more commonly familiar with digital tools including AI- powered platforms which make them an ideal sample to reflect on the impact of these tools on their critical thinking in their academic writing.

2.4.1 Students' Profile

This study selected a total of 97 third year students from Tlemcen University without any specific demographic information such as gender, age or academic background .As the only focus was on their writing performance far away from any personal characteristics.

2.4.2 Teachers' Profile

Five teachers specializing in Comprehension and Written Production (CWP) participated in face-to-face interviews which lasted between 10 to 30 minutes. These teachers were not asked about their age but on their Writing

teaching experience. They showed a diversity which varied between 7 to 17 years of experience.

2.5. Research Instruments

Research instruments are tools which help researchers gather, evaluate, and analyze data of a scientific research study (Johnson & Christensen, 2019). Selecting appropriate instruments is crucial, as they directly affect the accuracy, and reliability of the retrieved information.

In this study, the researchers relied on two primary instruments, aiming to collect both quantitative and qualitative data to gain a deeper understanding about the topic in study. First, a semi-structured interview was conducted with teachers to collect qualitative insights into their perspectives and experiences. Second, a test was administered to students to gather quantitative data on their performance.

The triangulation method was employed in this study to enhance the validity and reliability of the findings. According to Denzin (1979, p.291) “triangulation is the combination of methodologies in the study of the same phenomenon”. It involves the use of multiple data sources, methods or theoretical perspectives to corroborate results. This research incorporated methodological triangulation, combining qualitative interviews and quantitative tests to gain comprehensive understanding of the impact of AI tools on EFL students’ critical thinking in academic writing. Additionally, the study benefited from the involvement of two researchers working collaboratively as a team. This dual perspective allowed for richer interpretation and critical reflection, as each researcher could approach the data with their own critical lens.

2.5.1. The Interview

An interview is a qualitative research instrument that consists of a set of questions asked by the researcher to the informants to collect insights about a specific research topic. There are three types of interviews; structured, semi-structured and unstructured interview; In this study, a semi-structured interview composed of ten questions, which included a mixture of open-ended, closed-

ended, and multiple-choice items was used allowing flexibility for the interviewers to explore the teachers responses in more depth. According to Dovetail (2023), a semi-structured interview is “a qualitative research method used to gain an in-depth understanding of the respondent's feelings and beliefs on specific topics. As the interviewer prepares the questions ahead of time, they can adjust the order, skip any that are redundant, or create new ones”. This definition highlights the flexibility in semi-structured interviews, helping researchers to adjust their questions based on the flow of conversation.

The interview focused on the teacher's perceptions and knowledge about the nature of impact that AI tools may have on their third year students’ critical thinking in their academic writing. The objectives of the conducted interview were the following:

A/ to check the research hypotheses.

B/to gather teachers’ general perspectives and observations on their students' critical thinking skills in academic writing

C/ to know teachers’ suggestions and views about the integration of AI literacy into the curriculum.

2.5.2. The Test

According to Cohen *et al.*(2018, p. 402) “A test is a structured, systematic procedure for measuring a sample of behaviour by means of a set of questions or tasks that are administered under standard conditions”. A test is a research instrument that can measure specific characteristics such as participants’ knowledge, skills and abilities. It helps researchers to collect quantitative data that can be statistically analyzed.

The present study used a Traditional vs. AI-Assisted Essay Writing Test to examine the impacts of AI tools on EFL third year students’ essay writing performance. The instrument involved two essay writing tasks administered to two groups of students. Each group was asked to complete two essay topics.

The first test was a traditional essay writing task where students were asked to write, in class, an opinion essay on “how the use of AI has reshaped education in general and TEFL in specific” without using any form of AI or digital writing tools. This task was intended to reflect their natural writing abilities. The second test was an AI-assisted essay writing task in which students were asked to write at home an analytical essay about “how platforms like Facebook, Instagram, and Twitter Have changed the way people communicate and interact”. In this second task, students were allowed to get assistance from AI tools such as: ChatGPT, Grammarly, or similar platforms. Both groups followed the same procedure, ensuring a within-subject comparison of each student's performance with and without the integration of AI tools. The researchers administered these tests to students with the following objectives:

A/ to collect qualitative data about the topic studied.

B/ to compare students’ writing performance with and without the use of AI tools.

C/ to measure the effects of AI tools on students’ critical thinking during the writing process.

The results were used to analyze the impact of AI assistance on writing quality and to compare performance across the two conditions.

2.6.Data Analysis and Interpretation

The data collected through interviews and tests includes both qualitative and quantitative information. In the following section, these data will be analyzed and interpreted to draw meaningful conclusions.

2.6.1. Teachers’ Interview Analysis

The subsequent section will be devoted to analyzing interviews with CWP teachers. This research utilized a semi-structured interview as a second data collection tool comprising ten questions that encompass a combination of open-ended, closed-ended, and multiple-choice formats. The purpose of the

interview was to obtain additional information that would aid in understanding the teacher's perspective on the impacts of AI tools on students' critical thinking in their academic writing. The current section will analyze the responses the researchers recorded from the teachers.

Q1/ How long have you been teaching writing?

Table2. 1. Teachers' Years of Experience

Teachers	Years of Experience
Teacher (A)	17 years
Teacher (B)	12 years
Teacher (C)	11 years
Teacher (D)	7 years
Teacher (E)	10 years

This question aims to explore the duration of teachers' experience in teaching writing, in order to understand how this experience influences their perspectives on the integration of AI tools within English context as a foreign language. The table above displays the years of experience of all teachers who participated in this study, which vary from seven to seventeen years and can be considered reasonable; i.e. all of them taught before the emergence of AI technologies in Algeria. During their teaching careers, these teachers taught without the assistance of AI tools to students, which have enabled them to recognize and critically evaluate the transformative changes brought about by the introduction of such technologies.

Q2/In the recent few years that are characterized by the use of AI tools among students, did you notice any changes in the way students approach writing tasks? How?

All teachers (100%) claimed that they noticed a change in students' writing strategies influenced by the use of AI tools. Teacher (A) declared that they cannot stop students from using their mobiles while learning. Teacher (B) and (C) agreed that students increasingly depend on AI tools, particularly ChatGPT in accomplishing their essays or writing tasks. As they claimed that unfortunately it was a negative change. Teacher (D) highlighted that AI can enhance the quality of writing, offering suggestions for clarity, structure, and vocabulary. She added that this may lead to decrease students' writing abilities when students use AI to generate entire paragraphs or essays for them. Teacher (E) agreed with teacher (D) in the fact that AI is a helpful tool for students in writing. However, students are not making the required efforts in order to improve their knowledge about the different ways to write.

Q3/ How often do you encourage or discourage the use of AI tools in accomplishing writing assignments? Could you provide specific examples or situations that explain the reasons behind your stance?

The teachers' responses reflect a spectrum of attitudes toward AI in writing assignments, ranging from strict discouragement to conditional encouragement. Teacher (A) discourages AI use (especially ChatGPT) due to students' lack of critical engagement, fearing they will copy responses without thinking independently. In contrast, teacher (B) allows AI use but only for editing purposes, emphasizing human input first and AI assistance later. The control remains under her supervision. While teacher (C) supports AI use at an advanced academic level, particularly for Master's researches while collecting data for literature reviews, recognizing AI's efficiency in handling large amounts of information. Meanwhile teacher (D) adopts a balanced perspective, encouraging AI for grammar and clarity checks but discouraging reliance on it for generating ideas or writing. Teacher (E) acknowledges the inevitability of AI in modern learning and supports its role in assessment, advocating for students to learn proper AI usage.

Q4/In your opinion, how do AI tools influence students' ability to think critically while writing? Do they enhance or hinder critical thinking? Why?

Three out of five teachers argued that these tools may hinder critical thinking. Teacher (A) explained that students often copy content generated by AI tools without critically reading or analyzing it, which may lead to a decline in their academic performance and motivation to write. Furthermore, teacher (B) stated that some content produced by AI may not align with students' cultural and religious contexts. While teacher (E) emphasized the potential long-term health implications of these tools, suggesting that over-reliance on AI could contribute to cognitive decline, similar to conditions such as Alzheimer's disease. The two remaining teachers (C) and (D) expressed different view on the use of AI tools. Teacher (C) believes that students have sufficient language skills and competencies; they can rely on these tools primarily at higher academic levels, such as master's students. In contrast, Teacher (D) argued that the impact of AI tools can be both beneficial and detrimental, depending on how they are used. If students utilize AI for specific tasks like correcting writing, checking grammar, or organizing sentences, it can enhance their skills. However, if they overly depend on AI for content generation simply copying and pasting, it may hinder their writing.

Q5/In your experience, do AI tools impact students' ability to maintain accuracy in their academic writing?

Please justify your answer from the following options.

- a) AI tools significantly improve students' accuracy in writing by providing correct grammar and spelling suggestions.*
- b) AI tools often lead students to overlook mistakes, which can decrease the overall accuracy of their writing.*
- c) AI tools have no effect on students' accuracy in academic writing.*

Two teachers out of five chose *option (a)*. Specifically, teacher (D) and (E) asserted that if students utilize these tools appropriately, they can significantly enhance the writing process. While teacher (B) chose *option (b)* arguing that students might accept AI suggestions without verifying or understanding the corrections, fostering a habit of overlooking their own mistakes and potentially diminishing their writing skills overtime. The two

remaining teachers chose *option (c)*, teacher (C) justified that students do not compare between the first version written by them and the version provided by AI; they do not look critically at their writing while using the AI tool. Teacher (A) agreed with teacher (C) and said “AI tools do not really improve students’ accuracy in writing not because they lead students to overlook mistakes, but because students do not even read or see how the paragraph/essay is written; they do not pay attention to words, sentences, structure...etc”.

Q6/ Do you believe AI tools influence the relevance of the ideas students present in their academic writing? Please explain how?

a) AI tools enhance the relevance of ideas by helping students stay focused on their main points.

b) AI tools distract students from staying relevant, leading them to include off-topic or unnecessary information.

c) AI tools have no effect on the relevance of ideas in academic writing.

According to the collected data, two teachers out of five (40%) believe that AI tools do enhance the relevance of students’ ideas in academic writing. Teacher C assumes that AI tools help students make their ideas more clear and understandable, while teacher E says: “EFL students are learning the language in a foreign context, content and structure writings in academic norms, so here students face many challenges and AI can help them overcome these challenges”. In contrast, two other teachers (40%) argue that AI distracts students, leading them to include off-topic information. Here, teacher B says: “Our students are generally kind of demotivated to write, so they will just write the idea suggested by AI tools like Chat GPT and not their own ideas”. This illustrates a negative transfer, in the sense that some ideas proposed by AI tools don’t match with our culture and religion”. The fifth teacher (teacher D) offered a nuanced perspective, acknowledging both effects, indicating that AI’s impact depends on how students engage with it .She says: “AI can help students organize their thoughts by providing outlines or suggesting answers. When used properly, AI can serve as a tool to refine ideas and ensure they stay aligned with the main topic. But, if students rely on AI for content generation or research

answers without critically engaging with the material, they might end up including irrelevant information.”

The split of teachers’ responses between *options (a) and (b)* highlight a dual impact of AI tools on the relevance of students’ ideas in academic writing, suggesting that its effect depend on how students use it.

Q7/In your view, how do AI tools affect students' fairness in defending multiple sides of an argument? Please explain.

- a) AI tools help students defend multiple perspectives fairly and without bias.*
- b) AI tools may lead students to defend only one-sided arguments, lacking fairness.*
- c) AI tools have no effect on fairness in students' writing.*

Teacher (A) and (B) answered directly by *option (b)* without giving any further explanation. In contrast, teacher (D) chose *option (a)* justifying her choice saying that AI tools provide access to diverse viewpoints, summarizing different arguments, and reducing personal bias in writing. They can assist in structuring balanced arguments by offering counterpoints and supporting evidence. While teacher (C) and (E) did not choose any of the suggested options claiming that this is more personal and has relation with students’ ethics and how much they take in serious their academic studies.

Q8/ In your opinion, are students using AI tools appropriately, or they are ill-using them in ways that hinder their critical thinking development?

All the five teachers (100%) unanimously answered with *option (a)*, stating that students are misusing AI tools in ways that hinder their critical thinking development. Teachers provided various examples to illustrate students' inappropriate use of AI. Teacher A declared that students just copy what AI tools give them. Teacher B stated that, based on her observation, some students with average or below-average performance sometimes submit exceptionally well-written papers, raising doubts about their originality. While teacher C suggested that the issue could be related to a lack of training, as no

one teaches students how to use AI tools adequately. As a result, students are not making the best use of these tools.

Q9/ / Have you ever taught your students how to use AI tools effectively to avoid potential writing drawbacks? (Why?)

All five teachers (100%) responded negatively. The reasons behind their responses varied. Two teachers stated simply that they have not done so due to their own lack of knowledge and training in AI tools. The remaining three teachers mentioned that, they occasionally give advices on AI usage, without providing a formal lecture on the subject.

10/ Do you think integrating AI literacy into the curriculum would benefit students? If yes, what topics or skills should be prioritized?

All five teachers agreed that integrating AI literacy into the curriculum would benefit students, highlighting its importance in using it appropriately. However, their answers revealed varying priorities regarding which skills and topics should be emphasized. Two teachers emphasized the importance of speaking skill, with one of them also highlighting listening skill. Another teacher extended this focus on communication by suggesting writing skill, particularly in the context of dissertation writing, arguing that AI tools save time to the students in writing the literature review and analyzing a large amount of data. Moreover, another teacher stressed the ethical use of AI as a key topic, highlighting the importance of teaching students how to use AI tools ethically.

2.6.2. Test Analysis

As a second research tool, a written task was assigned to two groups from L3 students in order that the researchers test quantitatively how AI tools influence students' critical thinking abilities in academic writing.

Test design

To investigate the impact of AI assistance on students' critical thinking in academic writing, the researchers implemented a dual-task test design administered to two groups of L3 students. Each participant was required to complete two written tasks under differing situations:

- In the first situation, students were instructed to compose an essay on the topic “How platforms like Facebook, Instagram, and Twitter have changed the way people communicate and interact.” For this task, students were permitted to use AI-powered tools to aid them in their writing process.
- In the second situation, students completed a similar essay task on the topic “How the use of AI has reshaped education in general and TEFL in specific,” but without any external assistance, thereby simulating a traditional testing environment.

This contrast in task conditions enabled researchers to isolate the influence of AI tools on students’ performance. The students’ essays were then assessed using an analytic rubric targeting five critical thinking components: clarity of argument, relevance of evidence, depth and logic, language and style, and originality. This structured design ensured a consistent and measurable comparison between AI-assisted and non-assisted written outputs.

The evaluation was based on a scoring system with a top mark of 5 for each critical thinking component. A mark of 5 for ‘clarity of argument’ reflects a well-structured essay with a clearly articulated thesis and logically connected points. ‘Relevance of evidence’ is rated 5 when the essay integrates relevant, well-explained, and well-sourced support for its claims. ‘Depth and logic flow’ receives the highest score when the reasoning is insightful, consistently developed, and shows a strong progression of thought. For ‘language and style’, a score of 5 indicates a fluent, coherent, and engaging use of language that enhances the clarity and persuasiveness of the argument. Similarly, a top score in ‘Originality’ refers to an essay that demonstrates fresh, creative ideas and presents a unique perspective on the topic.

Here are some examples from paragraphs of essays that scored 5/5 in a specific criterion:

a- Student (8) got 5 on “clarity of arguments” in the following statement: *“Social media allows people to communicate instantly, eliminating delays seen in traditional communication methods. Platforms like Facebook Messenger and Twitter DMs enable real-time conversations, while Instagram and Facebook Live offer face-to-face interactions regardless of distance. A study by the Pew Research Center found that 81% of social media users feel more connected to their friends and family due to instant communication.”*

The statement is characterized by the following:

- Clarity and focus: social media enables instant communication.
- Multiple platforms are cited with relevant functions.
- It includes *credible statistical evidence* (Pew Research Center).
- The argument logically supports the thesis that social media improves communication

b- Student (14) got full grade on “relevance of evidence” in this statement: *“Social media provide a convenient way to maintain and strengthen relationships with family and friends who live far away, and also build new connections with foreigners.”*

This statement is characterized by the following:

- This supports the main claim that social media helps break geographical and cultural barriers.
- It is a relevant real-world application that most readers can recognize as true or relatable.
- Though not statistical, it is logically tied to the idea of global connectivity ; a major benefit attributed to social media.

c- Student (11) got 5 on “depth & logical flow” in this statement: *“Social media has also enabled people to connect with others who share similar interests and*

passions. This has led to the creation of online communities around shared interests, such as music, art, or sports. For example, Instagram has over 1 billion active users, with many users connecting with others through hashtags and online groups related to their interests.”

This statement is characterized by the following

- The paragraph opens with a clear topic sentence that directly supports the essay's thesis.
- It logically develops the point by explaining how shared interests form communities.
- It provides a concrete, relevant example (Instagram + hashtags/groups).
- The progression from general concept → impact → specific example demonstrates logical flow and clarity of thought.

d- Student (6) got 5 on “originality” in this statement: *“Instagram and Facebook encourage curated self-representation, where users often share highlight reels of their lives. A study by the American Psychological Association suggests that this can affect self-esteem and mental health.”*

- The concept of “curated self-representation” is a fresh and analytical phrase.
- It shows the writer thinking critically about how users manipulate their own image online — an idea not always found in basic treatments of social media.
- The link between self-presentation and mental health implications demonstrates thoughtful cause-effect reasoning, not just description.

e- Student (19) got 5 on “language and style” in this statement: *“These trends provide both beginners and experienced creators with opportunities to get noticed, build confidence in their skills, and engage with supportive online communities that appreciate and promote their work.”*

- This sentence is rich in precise and expressive vocabulary: “get noticed,” “build confidence,” “engage with supportive communities.”
- It maintains a positive and constructive tone, appropriate for the topic and purpose.

- The flow of ideas is natural, well-sequenced, and contributes to an encouraging message.

In the evaluation process, only the papers of students who participated in both tests; the traditional test and the one assisted by AI; were considered for correction. In Group 5, this applied to 34 students, and in Group 6, to 33 students.

In this analysis, each group of student essays; those written with the assistance of AI tools and those written through traditional, non-AI assistance; will be analyzed separately to ensure a clear and unbiased comparison of performance across the two conditions. The tables showing the evaluation of all students in Groups 5 and 6, both with and without the use of AI assistance, based on the specified criteria, are presented in the appendices.

a. Analysis of Group 5 Writing Tasks

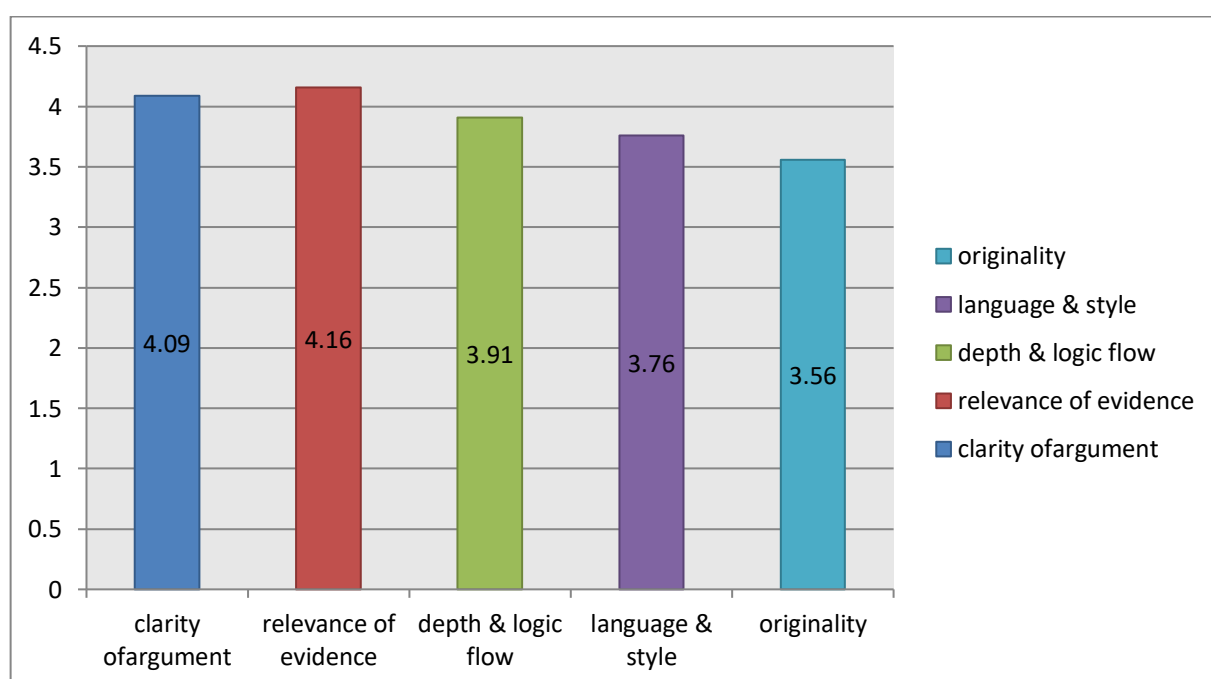


Figure2. 1. Average Scores of Group 5 Students Using AI across the Five Evaluation Criteria

This figure presents the average scores of Group 5 students who used AI in their writing, evaluated across five criteria. The highest score was in the relevance of evidence 4.16, indicating that AI tools effectively supported students in selecting and integrating appropriate examples or sources. This was

followed by clarity of argument 4.09, suggesting that AI use contributed to well-structured and coherent arguments. For instance, student (32) wrote, *"One major impact of social media is the immediacy of communication. Platforms like Twitter and Facebook allow users to share thoughts and updates in real time, fostering a culture of instant feedback and engagement. This shift from traditional communication methods to immediate sharing has connected people across the globe, making it easier to maintain relationships and stay informed about each other's lives."* This statement clearly introduces a central idea and logically connects it to the broader topic, reflecting the clarity that AI-assisted structuring can provide. The score for depth and logic flow was slightly lower 3.91, implying that while AI helped organize ideas, it may have limited students' ability to demonstrate deeper analytical thinking. Language and style received a moderate score 3.76, reflecting AI's ability to enhance grammar and formality, though possibly at the expense of personal voice or stylistic variety. The lowest score was in originality 3.56, highlighting a potential drawback of AI-generated content, which can often lack creativity or independent thought. Overall, the data suggests that while AI tools can enhance certain aspects of student writing, such as clarity and evidence use, they may inhibit originality and critical depth.

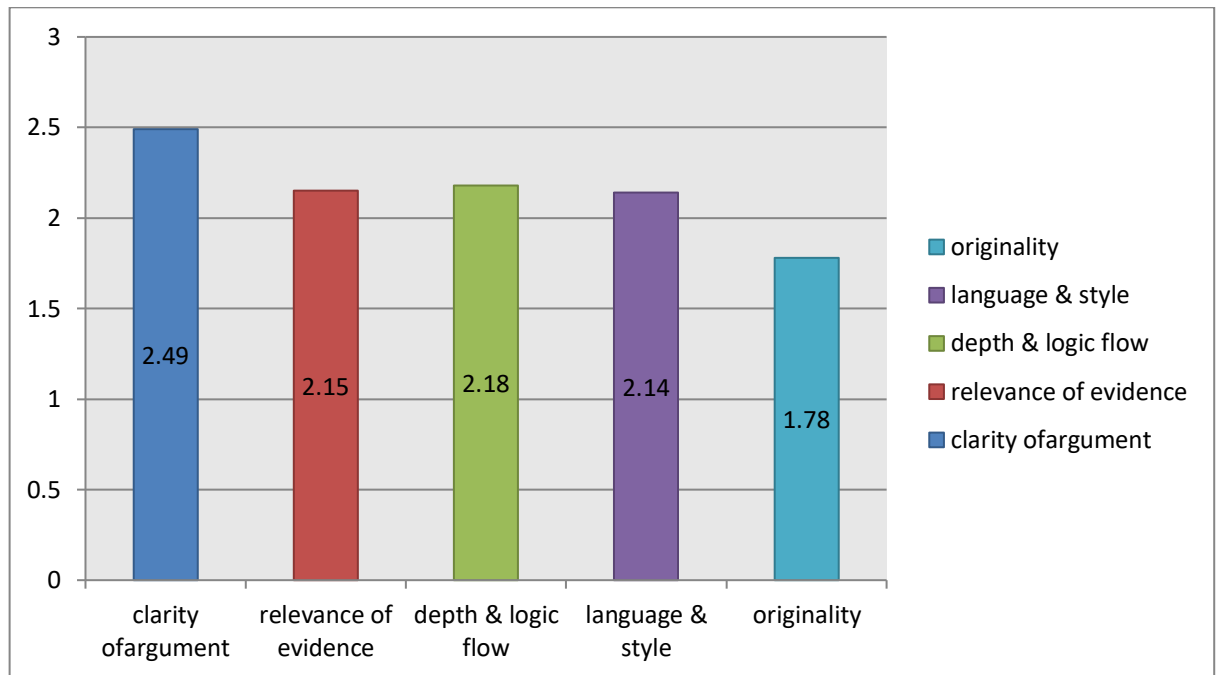


Figure2.2. Average Scores of Group 5 Students Not Using AI across the Five Evaluation Criteria.

The figure above illustrates the average scores of Group 5 students who did not use AI in their writing, assessed across the five evaluation criteria. Among the latter, clarity of argument showed the highest average score 2.49, suggesting that students were relatively more successful in expressing their ideas clearly without AI assistance. However, this score remains modest, and some responses still lacked coherence and precision. For example, student (32) wrote: *"People who believe that AI is helpful see that, according to several advantages they get from it. S, AI can give you multiple information from diverse sources in short amount of time..."* this sentence demonstrates confusion in both grammar and meaning. While the student's intention to describe AI's summarizing abilities is evident, the argument is difficult to follow due to unclear phrasing and poor structure. This illustrates that even the strongest category among non-AI users showed significant room for improvement. The average score of Depth and logic flow is 2.18 followed by language and style with 2.14, indicating a modest ability to organize thoughts and apply appropriate language, though with evident room for improvement. The relevance of evidence scored slightly lower 2.15, which may reflect difficulty in selecting and integrating supporting details effectively. The lowest score was in

originality 1.78, pointing to a significant weakness in presenting unique or creative ideas without technological support. Overall, the results suggest that students not using AI struggled more across all criteria, particularly in demonstrating originality and coherence, compared to their performance while using AI tools.

Table2.2. Average Scores in percentages of Group 5 Students with and without AI Assistance

	Averages	Percentages
With AI	3,9	77,94%
Without AI	2,15	42,94%
The excess	1,75	35%

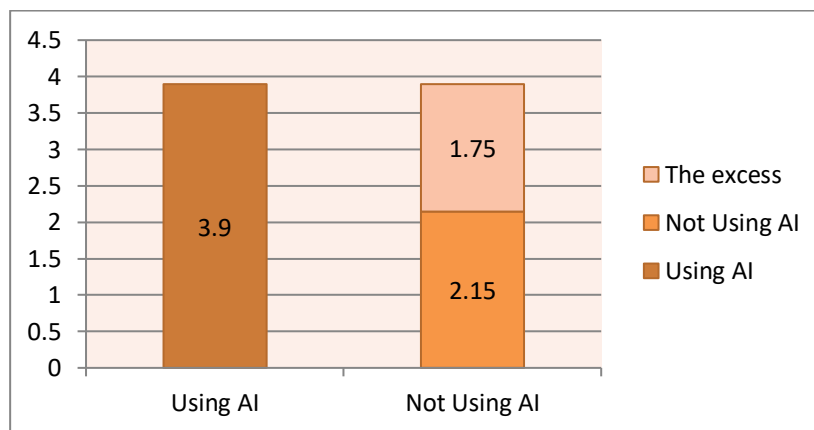


Figure2.3. Average Scores of Group 5 Students with and without AI Assistance.

The figure above represents the Average Scores of Group 5 Students with and without AI Assistance, which were obtained after measuring the average score of each student individually throughout the five 5 criteria. According to the bar chart, students who used AI assistance scored significantly higher, with an average score of 3.9 which represent almost 77.94% of the full grade, compared to those who did not use AI, who averaged only 2.15 which represents 42.94% of the full grade. The substantial difference of 1.75 which is 35%, it refers to the percentage by which the grades obtained when using AI exceeds the one obtained without the assistance of AI tools. The percentage

obtained suggests that AI assistance had a positive impact on the quality of students' critical thinking skills while writing, helping them produce more coherent and critically developed writing.

b. Analysis of Group 6 Writing Tasks

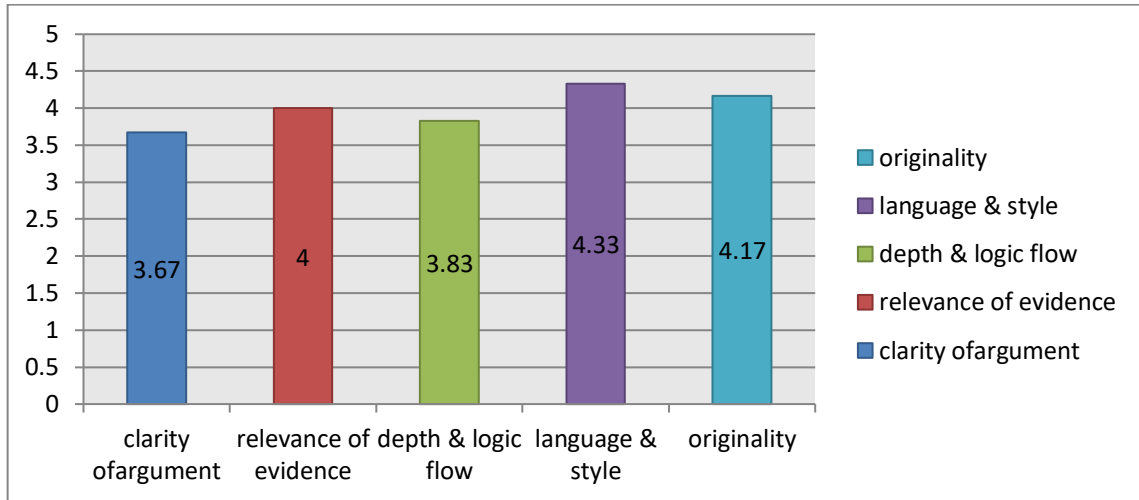


Figure 2.4. Average Scores of Group 6 Students Using AI across the Five Evaluation Criteria

The figure presents the average scores of a group of 6 students using AI across five evaluation criteria. The bar chart shows the scores for each criterion, with originality being the highest average score with 4.33, indicating that AI-supported writing may enhance creativity or help students express unique ideas. Language and style 4.17 and relevance of evidence 4.0 also scored highly, suggesting that AI tools may aid in structuring arguments effectively and selecting appropriate supporting information. However, clarity of argument 3.67 and depth and logic flow 3.83 scored slightly lower, pointing to potential areas where students might still need to develop their reasoning and coherence, even with AI support.

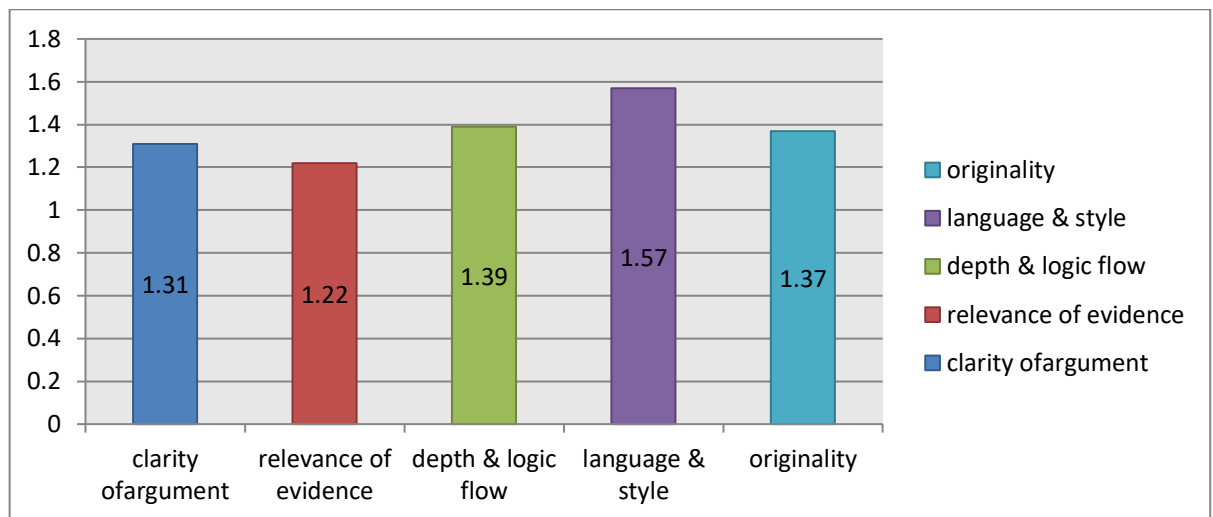


Figure2.5. Average Scores of Group 6 Students Not Using AI across the Five Evaluation Criteria. Average Scores of Group 6 Students Not Using AI across the Five Evaluation Criteria.

The figure presents the average scores of Group 6 students who did not use AI, evaluated across five criteria. The highest score was in language and style 1.57. However, all other areas scored notably lower, with relevance of evidence receiving the lowest score 1.22, suggesting significant difficulty in selecting appropriate and supportive content. Depth and logic flow 1.39 and originality 1.37 also reflected limited critical thinking and creativity in writing. Clarity of argument 1.31 was only slightly higher, pointing to challenges in organizing and expressing ideas coherently. Overall, the consistently low scores across all criteria highlight the struggles faced by Group 6 students in producing strong academic writing without the support of AI tools.

Table2. 3Average Scores in percentages of Group 6 Students with and without AI Assistance

	Averages	Percentages
With AI	3,74	74,82%
Without AI	1,4	28,09%
The excess	2,34	46,73%

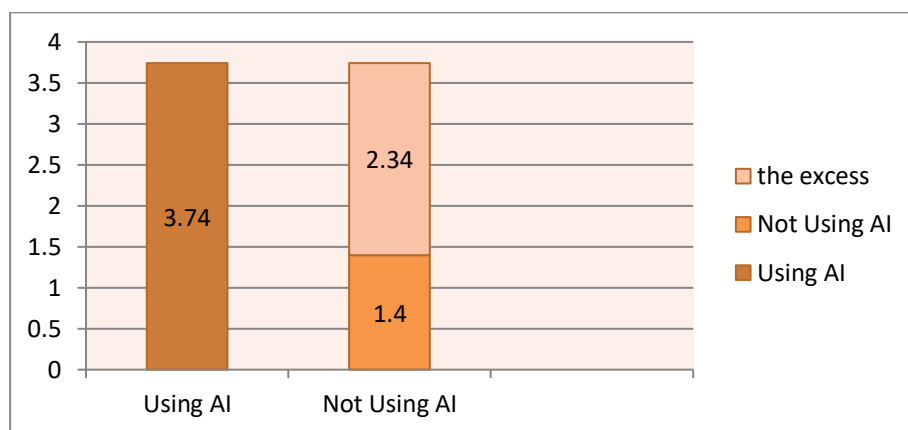


Figure 2.6 Average Scores of Group 6 Students with and without AI Assistance

The figure above represents the Average Scores of Group 6 Students with and without AI Assistance, which were obtained after measuring the average score of each student individually throughout the five 5 criteria. According to the bar chart, students who used AI assistance scored significantly higher, with an average score of 3.74 which represents 74.82% of the full grade, compared to those who did not use AI, who averaged only 1.4 which represents 28.09% of the full grade. The substantial difference of 2.34 which is 46.73% refers to the percentage by which the grades obtained when using AI exceeds the one obtained without the assistance of AI.

Table2. 4Comparison of Average Writing Scores between Group 5 and Group 6 Using AI across Five Evaluation Criteria

Criterion	Group 5 (AI users)	Group 6 (AI users)	Difference between G6&G5
Relevance of Evidence	4.16	4	0.16
Clarity of Argument	4.09	3.67	0.42
Depth&Logic Flow	3.91	3.83	0.08
Language& Style	3.6	4.17	0.41
Originality	3.56	4.33	0.77

The table presents a comparative overview of the average scores achieved by Group 5 and Group 6 students using AI tools across the five key critical thinking criteria. Although there are some differences in how Groups 5 and 6 performed across individual writing criteria, the overall variation between the two groups is relatively minor. None of the average score differences exceeded 1 point on the scale, indicating that the impact of AI use on writing quality was generally consistent across both groups. Group 5 scored slightly higher in clarity of argument and relevance of evidence, while Group 6 outperformed in originality and language/style. However, these differences were marginal and suggest that, regardless of the specific strengths, AI tools contributed similarly to the writing performance of both groups. This consistency reinforces the idea that AI-supported writing offers balanced benefits, aiding in both structure and creativity depending on how it is used.

Table2. 5. Comparison of Average Writing Scores between Group 5 and Group 6 without AI Assistance cross Five Evaluation Criteria

Criterion	Group 5 (AI users)	Group 6 (AI users)	Difference between G6&G5
Relevance of Evidence	2.15	1.22	0.93
Clarity of Argument	2.49	1.31	1.18
Depth&Logic Flow	2.18	1.39	1.79
Language& Style	2.14	1.57	0.57
Originality	1.78	1.37	0.41

The table presents average scores for Group 5 and Group 6 students who completed their writing tasks without the use of AI tools, evaluated across the five criteria. In all categories, Group 5 consistently outperformed Group 6, suggesting stronger writing skills. The most pronounced difference is in depth and logic flow, where Group 5 scored 2.18 compared to Group 6's 1.39; a gap of 1.79 points, indicating that Group 5 demonstrated significantly more coherent and developed reasoning. Similarly, in clarity of argument, Group 5 scored 2.49 versus 1.31 for Group 6, showing a 1.18-point difference. Smaller but still noticeable differences are seen in relevance of evidence 0.93, language and style 0.57, and originality 0.41. These results suggest that even without AI, Group 5 students had a stronger critical thinking skills development in academic writing, compared with group 6. The consistent gaps across criteria may also highlight disparities in prior writing experience or instructional quality between the two groups.

Table2. 6Comparative Differences in Writing Performance Criteria between Group 6 and Group 5 with and without AI Assistance.

Criterion	Difference between G6&G5when using AI	Difference between G6&G5 when not using AI
Relevance of Evidence	0.16	0.93
Clarity of Argument	0.42	1.18
Depth&Logic Flow	0.08	1.79
Language& Style	0.41	0.57
Originality	0.77	0.41

The table presents a comparative analysis of the differences in writing performance between Group 6 and Group 5 with AI assistance and without it across the five key writing criteria. When AI assistance is employed, the differences in average scores are noticeably smaller compared to those without AI. In essence, AI tools appear to overshadow individual differences and simultaneously amplify students' capacities, providing a form of academic support that benefits all students regardless of their initial proficiency level.

Table2. 7.The average scores of both groups with AI assistance and without it.

	Averages of group 5	Averages of group 6	Average of Both groups
With AI assistance	3.90	3.74	3.82
Without AI assistance	2.15	1.4	1.77

The table illustrates the average score obtained from both group 5 and 6 with AI assistance resulting in an average of 3.82. This average reflects a solid performance across writing criteria, however, the average of both group dropped sharply to 1.77. This indicates that without AI support, students struggled more significantly with key aspects of academic writing such as clarity, argumentation, and evidence integration. This striking contrast of more than 2 full points highlights a crucial concern; students who relied on AI tools performed poorly when such support was removed.

While AI can be a valuable source of information, it often overlooks foundational principles of academic writing—such as crafting a compelling hook or a clear thesis statement, particularly in students’ introductions. This performance gap suggests that while AI tools might superficially enhance writing outputs, they could also inadvertently undermine students’ independent cognitive skills. The diminished scores in the absence of AI indicate a possible over-reliance on these tools, raising concerns about their impact on essential academic abilities like critical thinking, reasoning, clarity, argument development, and originality

2.7. Discussion of the Main Results

The researchers obtained relevant data on the impact of AI tools on EFL students’ critical thinking in academic writing by conducting an interview and a test. Data analysis facilitated the examination of the research questions

presented and declared at the beginning of the study, as well as the verification of the hypotheses. This part will present a discussion of the main findings derived from the interviews conducted with CWP teachers and the test administered to students in relation to the current hypothesis. The triangular research methodology devised by the researcher resulted in a variety of findings that facilitate drawing a clear picture of novice teachers' needs and wants. These results also enabled the researcher to answer the questions aroused in the beginning of this work and to test the validity of the hypotheses. The following will set forth the main conclusions obtained from the study in correspondence with the research questions.

Research Question 1: How do teachers perceive the impact of AI tools on students' critical thinking in academic writing?

The first question was coined to demonstrate teachers' perspectives regarding the impact of AI tools on student's critical thinking in academic writing. In other words, this question emphasizes the acceptance or resistance of using these tools in academic writing.

The first hypothesis states that teachers may perceive that AI tools positively influence students' critical thinking in academic writing while simultaneously believe that excessive reliance on these tools may hinder independent thinking and creativity. The collected data from teachers' interviews indicates that EFL teachers generally perceive the impact of AI tools on students' critical thinking in academic writing with caution. While acknowledging that these tools have changed the way students approach writing tasks, many view this shift as potentially detrimental on the development of independent thinking skills. The prevailing concern is that overreliance on AI-generated content may reduce students' engagement in the cognitive processes necessary for critical analysis and original thought. However, teachers tend to support the AI use when it serves as an aid to the writing process such as for idea generation or language refinement rather than inprimary content creation. Overall, both students and teachers appear to recognize that AI can be a useful

instrument if used critically and purposefully, but they also share concerns about its potential to undermine deeper intellectual engagement in academic writing. Thus, the aforementioned discussion confirms the first hypothesis.

Research Question 2: What limitations and drawbacks might AI tools present for EFL students' critical thinking skills in their academic writing?

The second question aims to identify and analyze the potential limitations and negative effects of AI tools on the development of students' critical thinking in academic writing. It examines how the appropriate and inappropriate use of AI tools may influence students' cognitive engagement and the development of their critical thinking skills, based on their teachers' perceptions and supported by test results.

Concerning the second hypothesis, it indicates that the use of EFL students to AI tools might presents significant limitations by fostering dependency and inhibiting the development of independent reasoning skills such as clarity, argumentation and originality. The findings suggest that AI tools present several limitations that may hinder the development of EFL students' critical thinking skills in academic writing. Teachers reported that overreliance on AI can lead to a decline in students' motivation, creativity, and performance, as many students tend to accept AI-generated ideas without engaging in deeper analysis or original thought. This dependence often results in reduced self-editing and an increased tendency to overlook errors, ultimately affecting the accuracy and quality of their writing. Additionally, all interviewed teachers agreed that students are generally misusing AI tools, employing them in ways that substitute rather than support critical engagement with the writing process. The concern that AI may discourage independent thinking was further confirmed by a comparison between AI-assisted and traditional writing tests, where students performed significantly better when using AI; students' scores across all five assessed criteria; clarity of arguments, relevance of evidence, language and style, depth and logic flow, and originality were nearly doubled in the AI-assisted task, suggesting that their high scores were more reflective of the tool's input than their own cognitive effort. This sharp increase indicates

that the AI-generated content inflated the results, screening the students' concrete critical thinking abilities. In this way, the second provided hypothesis was confirmed.

3. How fostering AI literacy among EFL teachers and learners can enhance these benefits on students' critical thinking in academic writing and minimize the drawbacks?

This question intends to explore how fostering AI literacy among EFL teachers and learners can amplify the benefits of AI in developing students' critical thinking skills in academic writing, by enabling more effective, reflective, and responsible use of AI tools

The results from the conducted interviews with teachers consistently emphasized that current drawbacks associated with AI use such as; reduced analytical depth, passive dependence on AI-generated content, and disengagement; are not inherent to the technology itself, but rather stem from students' uncritical or inappropriate use of it. This insight is substantiated by the performance gap observed between AI-assisted and traditional student writing. While AI-supported students achieved higher average scores in clarity of argument and relevance of evidence, their performance declined in areas demanding deeper cognitive engagement, such as depth and logic flow and especially originality. In contrast, students who wrote without AI support demonstrated limited proficiency across all criteria, with particularly low scores in originality and logic flow, suggesting difficulty in independently developing coherent and insightful arguments. Overall, these findings suggest that when students are not equipped with the skills to use AI tools critically and reflectively, they either misuse the tools, leading to surface-level writing or underperform due to lack of adequate support. Therefore, integrating AI literacy into the curriculum can empower students to engage with AI tools as collaborators in the writing process without displacing their own critical thinking. Such an approach aligns with teachers' belief that responsible, guided use of AI can enhance, rather than inhibit, academic writing competence in EFL contexts. These results confirm Hypothesis 3, which proposed that fostering AI

literacy among EFL teachers and learners may maximize the benefits of AI tools in academic writing and minimize their drawbacks by equipping learners with the skills to critically evaluate AI-generated content and integrate it effectively into their learning processes.

2.8. Recommendations and Suggestions

This section of the current research work is almost reserved for discussing what might be practical recommendation to enhance students' critical thinking in academic writing. In this sense, one may attempt the following ideas for achieving this goal:

a. For stakeholders

- AI literacy should be systematically integrated into the curriculum to equip students with essential skills for responsible and effective AI use without compromising their critical thinking or creativity.
- Curriculum development should involve interdisciplinary collaboration among experts in education, technology, ethics, and psychology to ensure AI integration enhances learning while preserving cognitive development.
- Institutions should establish clear policies on ethical AI use to guide its responsible application across academic settings and safeguard academic integrity.
- Implementing comprehensive teacher training on AI to enhance educators' understanding and effective use of AI in the classroom.

b. For teachers

- Teachers should design tasks that develop critical thinking alongside AI use, requiring students to analyze, evaluate, and reason independently rather than rely on AI-generated outputs.
- Ethical and responsible AI use should be explicitly taught in classrooms to help students understand issues like plagiarism, bias, and overreliance, and to promote critical awareness.

- Ongoing professional development should be provided for educators to ensure they are well-prepared to integrate AI tools pedagogically and ethically.

c. For students

- Students should actively engage in AI literacy programs to build the knowledge and responsibility needed for effective and ethical technology use.

- Learners should be encouraged to reflect on their use of AI tools, fostering critical thinking by analyzing how AI influences their reasoning and decision-making.

- Students should participate in collaborative, AI-enhanced projects that combine human creativity with AI support to promote innovation and problem-solving skills.

2.9. Limitations of the Study

a- Time constraints: It significantly impacted the study. The process of test correction and data analysis were time-consuming, which limited the opportunity for deeper exploration and broader reflection on the findings.

b- Generalizability: The study involves only two groups of students, which restricts the ability to generalize the results that all students share the same proficiency level or are equal influenced by AI tools in their academic writing.

c- Ethical consideration: Although students were guided on how to use AI tools ethically, it became apparent that some simply copied and pasted AI-generated text without meaningful engagement. This raises concerns the academic integrity and the effectiveness of instruction on responsible tool usage.

d- Data collection instruments: The researchers and the supervisor wished to couple the students' tests with a questionnaire to capture students' perceptions on the test experience and the impact of AI tools on their critical thinking in academic writing. However, due to time limitations and the demanding nature of test itself it was impossible to do it. Although the researchers used multiple research instruments, the absence of questionnaire limited the opportunity for

broader triangulation and more comprehensive understanding of students' perceptions.

2.10. Conclusion

The present chapter dealt with the analysis and the interpretation of the quantitative and qualitative data that were obtained from the structured interview and test. The investigation was applied based on a studied sample of two groups from L3 EFL students. The researchers organized then analyzed and interpreted the gathered data for the purpose of answering the hypotheses of the research questions by either confirmation or rejection.

The final results shed light on the negative effects resulting from the use of AI tools in academic writing. Moreover, a set of recommendations and suggestions was presented for stakeholders, EFL learners as well as teachers in order to promote AI literacy among EFL students. Finally, this chapter mentioned some limitations faced by the investigators while conducting this study.

GENERAL CONCLUSION

General Conclusion

The continuous advancement of AI is prompting leaders across various fields to seek effective methods of regulation. Academic writing is no exception, as it increasingly depends on AI for a wide range of tasks. This growing reliance on AI in academic writing directly influences students' critical thinking skills, particularly in EFL contexts. However, the increasing use of AI in academic writing may give rise to various challenges related to students' cognitive development and academic integrity, highlighting the importance of equipping learners with the necessary skills to engage with these technologies responsibly within educational setting. In other words, this study tried to investigate the impact of AI tools on students' critical thinking in academic writing, emphasizing the potential challenges and highlighting the necessary literacy for this impact.

The present dissertation was divided into two chapters. The first chapter dealt with the theoretical aspect of the study. This was achieved by a comprehensive review of literature, including the explanation of the main topic ; the impact of AI on EFL students' critical thinking in academic writing, and its central themes including definitions as well as relationships between each part of the topic. The researchers mentioned some challenges of using AI tools in academic writing such as lack of critical thinking and concerns about plagiarism and originality, giving importance to AI literacy for EFL teachers and particularly students' academic writing. The second chapter centers the practical aspect of the study. A triangular methodology was employed. First, a structured interview with teachers of CWP module, and a test addressed to third year English students. Two instruments were used for the purpose of gathering qualitative and quantitative data, to assure reliability and validity. The core of this chapter was the discussion of the main finding which revealed that while AI tools can enhance EFL students' academic writing performance, their misuse may hinder critical thinking skills development. The results also emphasized the importance of AI literacy as a mitigating factor. Then, this chapter was concluded by a collection of the necessary recommendations yielded from this

investigation, and a number of limitations encountered during the whole process.

The researchers carried out this work with an experimental case study followed by designing three research questions connected with three main hypotheses. The investigators implemented a structured interview to answer the first hypothesis that was confirmed and proved through the analysis of the findings. It was grounded in the assumption that AI tools may have a potentially positive influence on academic writing, while concurrently posing risk to students' independent thinking and creativity. It focused on teachers' perceptions on the impact of AI tools on students' critical thinking in academic writing. The second hypothesis, related by the structured interview, the traditional and AI-assisted tests, was confirmed following the examination of teachers' responses during the interviews, as well as through the analysis of students' academic writing performance in the two tests. The last hypothesis, which posited that fostering AI literacy among EFL teachers and learners could maximize the benefits of AI tools in academic writing while minimizing their drawbacks, was confirmed through teachers' responses emphasizing the importance of integrating AI literacy into the educational curriculum. It was further supported by the outcomes of the AI-assisted writing tests, in which students were guided by teachers on how to use the tools appropriately before writing.

Last but not least, this research allows to a certain extent to shed light on the impact of AI tools on students' critical thinking in academic writing, aimed to investigate the appropriate recommendations for the effective use of AI technologies in academic writing, with the goal of enhancing their positive contributions, reducing their negative impacts, and ultimately improving students' critical thinking skills.

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APPENDICES

Appendices

Appendix A: Teachers' interview

Dear teachers,

this semi-structured interview aims to gather insights into teachers' perceptions about the impacts of AI (Artificial Intelligence) tools on students' critical thinking in their academic writing. Using the framework of Paul and Elder, which emphasizes that good critical thinking requires having a set of intellectual standards (such as clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness) will help gaining a further understanding about how these skills are influenced by AI.

Your time and willingness to participate in this interview are truly appreciated.

1/How long have you been teaching writing?

2/In the recent few years that are characterized by the use of AI tools among students, did you notice any changes in the way students approach writing tasks?(and how?)

3/How often do you encourage or discourage the use of AI tools in accomplishing writing assignments? Could you provide specific examples or situations that explain the reasons behind your stance?

4/In your opinion, how do AI tools influence students' ability to think critically while writing? Do they enhance or hinder critical thinking? Why?

5/In your experience, do AI tools impact students' ability to maintain accuracy in their academic writing?

Please justify your answer from the following options.

- a) AI tools significantly improve students' accuracy in writing by providing correct grammar and spelling suggestions.
- b) AI tools often lead students to overlook mistakes, which can decrease the overall accuracy of their writing.
- c) AI tools have no effect on students' accuracy in academic writing.

6/Do you believe AI tools influence the relevance of the ideas students present in their academic writing? Please explain how?

a) AI tools enhance the relevance of ideas by helping students stay focused on their main points.

b) AI tools distract students from staying relevant, leading them to include off-topic or unnecessary information.

c) AI tools have no effect on the relevance of ideas in academic writing.

7/In your view, how do AI tools affect students' fairness in presenting multiple sides of an argument?

Please explain.

a) AI tools help students present multiple perspectives fairly and without bias.

b) AI tools may lead students to present only one-sided arguments, lacking fairness.

c) AI tools have no effect on fairness in students' writing.

8/ In your opinion, are students using AI tools appropriately, or they are ill-using them in ways that hinder their critical thinking development?

If yes (appropriately), please illustrate.

If no, could you tell what are the best AI practices to develop students' critical thinking?

9/ Have you ever taught your students how to use AI tools effectively to avoid potential drawbacks?(why?)

10/ Do you think integrating AI literacy into the curriculum would benefit students? If yes, what topics or skills should be prioritized?

Appendix B: Students' Essays

The researchers reviewed approximately 136 essays. Due to space constraints, it is not possible to include all of them here; however, the following are the essays from which excerpts were cited as examples in the study.

Student (8)

Connecting with others worldwide is now as simple as a few taps on a screen. Social media platforms like Facebook, Instagram, and Twitter have reshaped communication, making it faster, more accessible, and more engaging. These platforms are essential for personal connections, business networking, and social movements.

Social media has improved communication by making it instant, strengthening relationships, and fostering global connectivity.

Social media allows people to communicate instantly, eliminating delays seen in traditional communication methods. Platforms like Facebook Messenger and Twitter DMs enable real-time conversations, while Instagram and Facebook Live offer face-to-face interactions regardless of distance. A study by the Pew Research Center found that 81% of social media users feel more connected to their friends and family due to instant communication. Additionally, businesses benefit from quick responses through platforms like Twitter, where companies address customer concerns in real-time. The speed and accessibility of social media keep people connected at all times.

These platforms also help maintain relationships and expand networks. Features like Facebook's friend suggestions, Instagram's direct messaging, and LinkedIn's professional networking make staying connected easier. Businesses use social media to engage with customers, strengthening brand loyalty and customer relationships. For instance, a LinkedIn survey revealed that 61% of professionals believe social media has helped them expand their career opportunities. Similarly, Instagram reports that 90% of users follow at least one

business, indicating the strong connection between companies and consumers through social platforms.

Beyond personal and professional connections, social media promotes global awareness and community building. Twitter hashtags and Facebook groups bring people together around shared interests and causes. Whether raising awareness for social issues or fostering discussions on global topics, these platforms create a sense of unity across cultures. Movements like #MeToo and #BlackLivesMatter gained global traction through Twitter, encouraging millions to participate in discussions on social justice. Similarly, Facebook groups dedicated to mental health support allow people from different backgrounds to share experiences and provide encouragement. These examples show how social media fosters meaningful conversations and unites people worldwide.

Social media has transformed communication by making it faster, more inclusive, and globally connected. It strengthens relationships, enhances networking, and fosters discussions that bridge geographical and cultural gaps. As digital interactions continue to evolve, social media remains a powerful tool for connecting the world.

Student (14)

Nowadays, social media become the mirror that reflect a version of our reality and the golden ticket to reside in the heart of modern technology. Many of these media operate completely free, as they enable users to share and interact with content without any financial compensation. These platforms are characterized by great diversity, some of them specialize in various fields as Facebook and Instagram, while others specialize in one type of content as Twitter. Despite minor differences, I believe that they share the ultimate goal of communication as they shaped the way people interact with each other, and I support this view for a variety of reasons.

A lot of people think the same way I do. First, social networks break geographical barriers since they give individuals the chance to globally

communicate despite long distances and cultural differences. Besides, social media provide a convenient way to maintain and strengthen relationships with family and friends who live far away, and also build new connections with foreigners. Additionally, they guarantee the freedom of opinion expression by allowing users of all ages to find their voices, and create accounts that reach a broader audience than traditional settings. This opportunity can help people boost their confidence, develop new communication skills, and rapidly share meaningful or positive messages with others. So, social media reduce the gap between human beings and the outside world.

The last but not the least, these platforms mark a shift in professional, social, and cultural principles. Many businesses of all types, grow and see the light through social media permit companies to establish their brands and promote their products, culminate a loyal audience, and improve costumers' journey to gain their trust. These media represent a suitable base for learning and education, anyone can be a student, as there are no boundaries to learning with the abundance of online courses and content today. They serve as an excellent platform for students to connect with mentors, discover training programs, and acquire new skills to advance toward their career aspirations. Moreover, they open the door for us to learn about other cultures due to the pictures, videos, and texts, published by people from different areas of the world.

However, some people think differently, believing that social media are more of a waste of time rather than they are beneficial. On one hand, social networks pose significant privacy and security risks, such as data breaches and unauthorized access to sensitive details. Furthermore, they are designed to be captivating, which lead to addictive habits that may harm relationships, reduce productivity, and negatively impact mental well-being. On the other hand, these few shortcomings cannot deny the fact that social media facilitate the creation of online communities centered around shared interests, promoting collaboration and mutual support. In addition to this, they raise users' awareness and offer them an endless stream of entertainment.

To sum up, I am totally convinced that social media, particularly, Facebook, Instagram, and Twitter, have taken over the throne of technology and alternate communication methods thanks to their multiple services. They destroy the wall of isolation and enhance individuals' consciousness of global events and current affairs. They turn into the driving force of the majority of human processes and activities. So, it is safe to say that their good impact is strongly fuelled by their proper use.

Student (11)

A Platform is a space or tool that allows people to interact, share, or do something. It can be a website, application, or service that provides access to information, resources, or connections. Think of it like a playground where people can come together to achieve a specific goal or purpose.

I firstly believe that, the rise of social media platforms like Facebook, Instagram, and Twitter has revolutionized the way people communicate and interact, ultimately leading to a more connected and inclusive global community by enabling people to connect with others who share similar interests, providing a platform for people to share their creativity and talents, and enabling people to access news and information from around the world.

Social media has also enabled people to connect with others who share similar interests and passions. This has led to the creation of online communities around shared interests, such as music, art, or sports. For example, Instagram has over 1 billion active users, with many users connecting with others through hashtags and online groups related to their interests.

Another way social media has impacted communication is by providing a platform for people to share their creativity and talents. Social media platforms like YouTube, TikTok, and Instagram have given people the opportunity to share their music, art, dance, and other creative endeavors with a global audience. For instance, YouTube has over 2 billion monthly active users, with

many users sharing their creative content and connecting with others who share similar interests.

Social media has also enabled people to access news and information from around the world. Social media platforms like Twitter and Facebook have become important sources of news and information, with many people relying on social media to stay up-to-date on current events. For example, Twitter has over 330 million monthly active users, with many users following news organizations and journalists to stay informed about current events.

In conclusion, social media has revolutionized communication and interaction, making the world a more connected and inclusive place. By connecting people with similar interests, showcasing creativity and talent, and sharing global news, social media has brought people closer together

Student (6)

Social media has transformed the way people communicate and interact, making the world more connected than ever before. Platforms like Facebook, Instagram, and Twitter have reshaped human interaction by introducing instant messaging, multimedia sharing, and real-time updates. These platforms influence personal, professional, and societal communication. Social media platforms have significantly altered communication and interaction by promoting instant connectivity, changing social behaviors, and influencing information exchange.

The emergence of social media has facilitated instant and global communication, allowing people to connect regardless of time and location. Traditional means of communication, such as letters and phone calls, have been largely replaced by instant messaging and video calls. This shift has made interactions more immediate and convenient. A 2022 study by Pew Research Center found that over 70% of people use social media daily to stay in touch with friends and family, highlighting its role in global connectivity.

Social media has also influenced human behavior, reshaping social interactions and self-expression. These platforms have created new ways for people to present themselves, interact with others, and form online communities. Social norms have evolved to include digital etiquette and online engagement. Instagram and Facebook encourage curated self-representation, where users often share highlight reels of their lives. A study by the American Psychological Association suggests that this can affect self-esteem and mental health.

Social media plays a crucial role in information dissemination, influencing public opinion and shaping discourse on global issues. While social media allows for the rapid spread of news, it also raises concerns about misinformation and echo chambers. Twitter has become a primary source of breaking news, with journalists and organizations using it to provide real-time updates. However, studies show that false information spreads six times faster than factual news.

In conclusion, social media platforms have revolutionized communication by enabling instant connectivity, altering social behaviors, and changing the way information is shared. These platforms have enhanced global interactions, introduced new social norms, and reshaped news consumption. While social media offers numerous benefits, it also presents challenges that society must navigate carefully to maintain healthy and meaningful communication.

Student (19)

Social media has revolutionized the way we communicate, bringing people closer together and fostering a sense of global community. While concerns about misinformation and privacy exist, the positive impact of social media on communication cannot be denied. This essay will explore the benefits of social media in facilitating instant connections, promoting diverse perspectives, and empowering individuals to share their voices.

One of the most significant advantages of social media is its ability to bridge geographical distances and connect people instantly. Platforms like Facebook, Twitter, and Instagram allow individuals to share updates, thoughts,

and experiences in real time, fostering a sense of immediacy and engagement. This instant connection has transformed the way we maintain relationships, allowing us to stay informed about friends and family members regardless of their location. Moreover, social media platforms provide a space for people to connect with like-minded individuals, forming online communities and fostering a sense of belonging.

Another crucial benefit of social media is its potential to promote diverse perspectives and challenge existing narratives. The accessibility of social media platforms allows individuals to share their unique experiences and viewpoints, creating a space for dialogue and understanding. This open exchange of ideas can challenge societal biases, promote critical thinking, and foster a more inclusive and tolerant society. Social media can act as a platform for marginalized voices to be heard, amplifying their perspectives and contributing to a more nuanced understanding of the world.

In conclusion, social media has undeniably transformed the landscape of communication, offering numerous benefits that outweigh its potential drawbacks. The ability to connect instantly, share diverse perspectives, and empower individuals to share their voices are invaluable contributions of social media to modern society. While navigating the challenges of misinformation and privacy is essential, embracing the positive aspects of social media can foster a more connected, informed, and inclusive world.

Student (32)

AI tools became popular nowadays ,users divided into two groups ,some see it useful and others not. For me i found it effective and very useful. So this essay will discuss the two opinions around the ai tools and how it affects education and the TEFL in specific.

People who believe that AIs helpful see that according to several advantages they get from it. So AI can give you multiple information from diverse sources in short amount of time. Example you can provide long and full

documents and the ai application can summarize it for you keeping the most important information. And it can give you an images and creates for you specific picture according to the information and details you gave.

In the other hand people who are not satisfied from AI tools and believe that's it reshaped and affected education (TEFL in specific) in a bad way by making people lazy and does not believe in their own ideas. Also people who rely on it in their assessment of writing found sometimes that's their words are out of topic.

In conclusion AI tools can make you done your work in short period of time with less effort and good advanced vocabulary with zero mistakes. But it can make you feel lazy and not enough. And for me i believe that this application and tools are useful but we have to control ourselves while using them.

Appendix C : Students' Evaluation

Table of Evaluation of Group 5 with AI Assistance

Criteria	Clarity of arguments	Relevance of evidence	Depth and logic flow	Language and style	originality
Student 1	4,5	4,5	4,5	4,5	4
Student 2	2	2	2	2	2
Student 3	4	4	4	3,5	3,5
Student 4	4,5	4,5	4,5	4,5	4
Student 5	5	5	4	4	4
Student 6	5	5	5	5	4
Student 7	3	3	2,5	2,5	2
Student 8	5	5	5	5	4
Student 9	3	3	2,5	3	2,5
Student 10	4	4	4	4	3
Student 11	3	3	3	2	3
Student 12	5	5	5	5	5
Student 13	5	4	4	4	4
Student 14	5	5	5	5	5
Student 15	3,5	3,5	3,5	3,5	3
Student 16	5	5	5	4	4
Student 17	5	5	5	5	4

Student 18	4	4	4	3,5	4
Student 19	5	5	5	5	5
Student 20	4	4	4	4	3,5
Student 21	5	5	5	4	4
Student 22	3	4	3	2	3
Student 23	4	5	4	4	4
Student 24	4	4	3	3	3
Student 25	4	4	4	4	4
Student 26	4	4	4	4	3,5
Student 27	3	3	2	2	2
Student 28	4	4	3	3	3
Student 29	3,5	3,5	3,5	3,5	3
Student 30	4	4,5	4,5	4	4
Student 31	4	4	3	3	3
Student 32	4	4	4,5	4,5	4
Student 33	4	4	4	4	4
Student 34	4	5	4	4	3

Table of Evaluation of Group 5 without AI Assistance

Criteria	Clarity of arguments	Relevance of evidence	Depth and logic flow	Language and style	originality
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Student1	3,5	3	3	3,5	2,5
Student 2	1	0,75	1	1,5	1
Student 3	1	0,75	0,75	1	1
Student 4	3	2	2	1	2
Student 5	2	2	2	2	2,5
Student 6	3	2,5	2	3	2
Student 7	2	1	1,5	0,75	1
Student 8	3,5	3	3	3	3
Student 9	2,5	2,5	3	3	1,5
Student 10	2,5	2	2,5	2,5	1,5
Student 11	3	2,5	2,75	3	1,5
Student 12	3,5	3	2,75	3	2,5
Student 13	2	1,5	2	1	1
Student 14	3,5	3,5	3	3	2,5
Student 15	2,5	2,5	2,5	2	1,5
Student 16	2	2	2	1,5	1
Student 17	2	2	2	1,5	1
Student 18	2,5	2	2	2	1,5
Student 19	3	2,5	2,75	2,5	2,75
Student 20	2,5	2	2,5	2	2

Student 21	2	2	1,75	2	1,5
Student 22	2,5	2	2	2	2,5
Student 23	3	2,5	2,5	2,5	2
Student 24	3	2,5	2,75	3	2
Student 25	2	2	2,25	2	2
Student 26	1	1	1,75	1,5	1,5
Student 27	2,5	3	2	2,5	2
Student 28	2,75	2,5	2	2	2,5
Student 29	2	2	1,5	2	2,5
Student 30	2,5	1,5	1,75	1	1
Student 31	2	2	2	2,5	1,5
Student 32	3	2	2	2,5	1
Student 33	3	2,5	2,5	2,5	1,5
Student 34	2,75	2,5	2,5	2	1,75

Table of Evaluation of group 6 with AI Assistance

Criteria	Clarity of arguments	Relevance of evidence	Depth and logic flow	Language and style	originality
Student 1	3	3	3	3,5	3
Student 2	4	3,75	4	4	4
Student 3	4	4	3,75	4	4

Student 4	3,5	3	3	3,5	3
Student 5	3,5	3	3,5	3,75	3
Student 6	4,75	4	4	4,5	5
Student 7	3	3,5	3	3,5	3
Student 8	3	3,5	3	3,5	3
Student 9	3	3,5	3	3,5	3
Student 10	3	3	3	3	3
Student 11	3,5	3	3,5	3	3
Student 12	3,75	3,75	3,5	4,5	4
Student 13	3	3	3,5	3,75	3
Student 14	3	3	3,5	3,75	3,5
Student 15	4,75	4,75	4	4,75	5
Student 16	3	3	3,5	4	3
Student 17	3	3	3,5	3,75	3,75
Student 18	4	4	3,75	4	4
Student 19	4	3,5	3,75	3	3,5
Student 20	4,5	4,5	4	4,75	5
Student 21	3	3	3	3	3
Student 22	4,5	4,5	4,5	4,75	5
Student 23	4,5	4,75	4,5	4,75	5

Student 24	4	4	4,5	4,5	4,75
Student 25	3,75	3,75	3,5	4	4
Student 26	4,5	4,5	4	4,75	5
Student 27	4,5	4,5	4	4,75	4,75
Student 28	3	3	3,5	3,5	3,75
Student 29	3	3	3,5	3,75	3,75
Student 30	3,5	3,5	3	3,75	3,5
Student 31	3	3	3	3,75	3,5
Student 32	4	4,5	4	4,5	4,5
Student 33	4	4,5	4,5	4,75	4,5
Student 34	3	3	3	3,5	3

Table of Evaluation of group 6 without AI Assistance

Criteria	Clarity of arguments	Relevance of evidence	Depth and logic flow	Language and style	originality
Student 1	2	1,75	1,75	1,75	1,75
Student 2	1	1	2	2	1,75
Student 3	3	3	3	3	3,5
Student 4	2,5	2	2	2	2
Student 5	1,5	1,5	1	1,5	1
Student 6	1,5	1	1	1	1

Student 7	1	1	1	1	1
Student 8	1	1	1	1	1
Student 9	1,5	1,5	1	1	1,5
Student 10	1,5	1	1,5	1,5	1
Student 11	3	3	3,75	3,5	3
Student 12	0,5	0,5	1	1	0,5
Student 13	1	1	1	1,5	1
Student 14	1	0,5	1	0,5	0,5
Student 15	3,5	3	3,5	4	3,5
Student 16	2	1,5	1	1,5	1,5
Student 17	0	0	0	0	0
Student 18	1	0,75	0,75	1,5	0,75
Student 19	1	0,5	1	0,5	0,75
Student 20	0	0	0,5	1	0
Student 21	3	3	3	3,5	3
Student 22	0,5	0,5	1	0,75	1
Student 23	1	1	1,5	1,75	1
Student 24	1,5	2	2,5	2	2
Student 25	3,5	3,75	3	4	3,5
Student 26	1	1,5	1	2	1,75

Student 27	1	1,5	2	1,5	1,75
Student 28	1	1	1,5	2	1,75
Student 29	0	0	0	0	0
Student 30	0,5	0	0,5	1	0,75
Student 31	1	0,75	1	1,5	1
Student 32	0,5	0,5	0,5	1	0,5
Student 33	0,5	0,5	1	1	0,75
Student 34	2	1,75	1,75	1,75	1,75

تناولت هذه الدراسة تأثير وسائل الذكاء الاصطناعي على التفكير النقدي لدى طلاب اللغة الإنجليزية كلغة أجنبية في الكتابة الأكاديمية بجامعة تلمسان. ومن خلال المقابلات ونوعين من الاختبارات، توصل الباحثون إلى أن الذكاء الاصطناعي يمكن أن يكون له دور إيجابي أو سلبي في تنمية التفكير النقدي، وذلك حسب طريقة استخدامه. وقد أظهرت النتائج أن الاستخدام غير الواعي لتلك الأدوات قد يؤدي إلى ضعف في التفكير النقدي والإبداع لدى الطلاب. وبناءً على ذلك، يقترح البحث في ختامه مجموعة من التوصيات للحد من هذه الآثار السلبية وتعزيز دمج الذكاء الاصطناعي بشكل أكثر فاعلية ووعي في المجال الأكاديمي.

الكلمات المفتاحية: التفكير النقدي، الذكاء الاصطناعي، الكتابة الأكاديمية، اللغة الإنجليزية كلغة أجنبية.

Summary

This study investigates the impact of Artificial Intelligence tools on EFL students' critical thinking in academic writing among at Tlemcen University. Using an interview and two types of tests, the researchers found that AI can both support and/or hinder students' critical thinking in academic writing, depending largely on how it is utilized. The findings highlighted that AI use can negatively affect EFL students by diminishing their critical thinking abilities and creativity in writing. Accordingly, specific recommendations are proposed at the end of the dissertation to mitigate these adverse effects and promote more thoughtful and effective integration of AI tools.

Keywords: Academic Writing, Artificial Intelligence (AI), Critical thinking, EFL students

Résumé

Cette étude a examiné l'impact des outils d'intelligence artificielle sur la pensée critique des étudiants en Anglais (ALE) dans le cadre de la rédaction académique à l'Université de Tlemcen. À travers des entretiens et deux types de tests, les chercheurs ont constaté que l'IA peut à la fois favoriser et/ou empêcher le développement de la pensée critique, selon la manière dont elle est utilisée. Les résultats ont montré que l'usage non réfléchi de ces outils peut nuire à la créativité et aux capacités critiques des étudiants. En réponse à cela, des recommandations concrètes sont proposées à la fin du travail afin de limiter ces effets négatifs et encourager une utilisation plus consciente et efficace de l'IA dans le contexte académique.

Mots-clés : ALE, Intelligence artificielle (IA), Pensée critique, rédaction académique