

**PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
Abdelhafid Boussouf University Center - Mila**



***Institute of Letters and Languages
Department of Foreign Languages
Branch: English***

**Exploring EFL Teachers' and Learners' Perceptions of the Use of AI-
Powered Personalized Learning Tools for the Development of the
Learners' Writing Skill**

A Case study of Third-Year students of English at Abdelhafid Boussouf University
Center of Mila

A Dissertation Submitted in Partial Fulfillment for the Requirement of the Master Degree in
Didactics of Foreign Languages

Presented by:

1) Teqwa Manar MERZOUKI

2) Meriem NOUIOUA

Supervisor:

Dr. Fouad BOULKROUN

Board of Examiners:

Chairwoman: Dr. Rima HADEF

Supervisor: Dr. Fouad BOULKROUN

Examiner: Dr. Yamina BENNANE

Academic Year: 2024-2025

PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA
MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH
Abdelhafid Boussouf University Center - Mila



*Institute of Letters and Languages
Department of Foreign Languages
Branch: English*

**Exploring EFL Teachers' and Learners' Perceptions of the Use of AI-
Powered Personalized Learning Tools for the Development of the
Learners' Writing Skill**

A Case Study of Third-Year Students of English at Abdelhafid Boussouf University
Center of Mila

A Dissertation Submitted in Partial Fulfillment for the Requirement of the Master Degree in
Didactics of Foreign Languages

Presented by:

1) Teqwa Manar MERZOUKI

2) Meriem NOUIOUA

Supervisor:

Dr. Fouad BOULKROUN

Board of Examiners:

Chairwoman: Dr. Rima HADEF

Supervisor: Dr. Fouad BOULKROUN

Examiner: Dr. Yamina BENNANE

Academic Year: 2024-2025

Dedication I

*First and foremost, all praise and gratitude belong to **Allah**, the Most Merciful, whose boundless grace has guided me through every step of this journey.*

*To my dearest parents, my gorgeous mother, **Amina**, and my precious father, **Riad**, who have always been my anchors, my guiding stars, and my lifelong supporters. Thank you for your endless love, sacrifices, and unwavering belief in me. I could never repay the countless ways you've carried me, from my very first day in life to this moment.*

*To my dear sister, **Koudwa**, thank you for your constant support, kindness and care. When doubt clouded my path, your encouragement kept me moving forward.*

*To my brothers, **Baraa**, **Modaker**, and **Obaida**, thank you for always being there when I needed you most. You are my forever team.*

*To my aunt, **Zineb**, you have been like a second mother to me, loving and supporting me as your own. I will carry your lessons and love with me always.*

To my grandparents, whose love never wavered and whose prayers have been my invisible wings. Your faith in me is a treasure I hold close.

To all my family, aunts, uncles, and cousins, your presence in my life is something I will always cherish.

*To my partner in this work, **Meriem**, thank you for dreaming alongside me, and for believing in this work even when the path felt unclear. I'm grateful we built every piece of this together.*

To all my friends, near and far, I appreciate your companionship and support along the way.

Lastly, to myself, for surviving days I once feared would break me, for finding strength when hope seemed distant, and for persisting until this moment. I'm truly proud of you.

Tegwa Manar

Dedication II

This dissertation is dedicated to every loving soul, every kind heart that supported me and believed in me throughout this journey.

This work indeed stands in honor of my loving family, your love has been my anchor, your support my wings. Your kind words of encouragement have illuminated my darkest moments. This achievement is as much yours as it is mine.

*To my **mother**'s kindness and my **father**'s strength. Your unconditional, endless love, unwavering support, and sacrifices have been the backbone of every success I achieved. May **Allah** protect you and grant you all the blessings.*

*To my older sister, **Razika**, my second mother, words cannot describe how thankful I am. You filled my life with the happiest moments ever. I thank you from the deepest part of my heart.*

*To my beloved sister, **Fadila**, the kindest soul who has always stood by my side, thank you for not letting me give up when every single circumstance obliged me to.*

*To my HEROES, my brothers, **Hossein**, **Hicham**, and **Ali**, you gentlemen have made this journey possible. You are the shield between me and the world. I will always be grateful to your efforts as long as my heart is beating.*

*To my sister-in-law, beautiful **Mona**, may our bond grow ever stronger.*

*To my cheerful friend **Oumaima**, thank you for being the closest, kindest friend ever.*

*To my sweet partner **Manar**, thank you for walking this path with me step by step. Your presence has turned challenges into joy.*

*To my role model and lovely **teacher** at secondary school. Your beautiful aura has always inspired me. You were my first spark of inspiration and I am truly grateful to every single thing you taught me, you will always be memorable.*

To all teachers and friends who shared with me this long path.

*With the sincerest love my heart can bear, thank you, **Meriem**.*

Acknowledgments

We would like to begin by expressing our deepest gratitude to **Allah Almighty**, whose infinite mercy and guidance have been our constant source of strength and perseverance throughout this journey. Without the blessings and patience, He granted us, none of this would have been achieved.

We are profoundly grateful to **Dr. Fouad Boulkroun**, our esteemed supervisor, for his steadfast dedication, insightful guidance, and invaluable expertise. His patience, wisdom, and constructive feedback have been key in shaping this research. We are deeply grateful.

We also extend our profound gratitude to the members of the jury, for their time, discerning evaluation, and invaluable feedback, which have greatly enhanced the quality of this work.

Our heartfelt appreciation goes to all the teachers and third-year English students at the Department of Foreign Languages at Mila University Center. Your participation and cooperation have been instrumentally indispensable to the successful completion of this research.

Finally, we truly thank everyone who has supported us throughout our academic journey.

Abstract

Enhancing the writing skill among EFL learners is problematic, especially when instruction is not tailored and does not match the learners' needs. Therefore, the integration of AI-powered technology has become vital, for it offers a personalized learning journey. The current study aims at exploring EFL learners' and teachers' perceptions of the use of AI-powered personalized learning for the development of the learners' writing skill. To achieve the purpose of this study, four research questions are raised: (1) What are EFL students' perceptions the use of AI-personalized learning tools for the enhancement of the writing skill. (2) What are the teachers' perceptions regarding the effectiveness of AI-powered personalized learning tools in the development of the writing skill? (3) To which extent do students use AI tools for improving their writing skill? (4) What are the different AI-powered tools students use to refine their writing skill? In order to answer these questions, two questionnaires were administered to a sample of 70 third-year EFL students and 15 teachers of English at Mila University Center. The findings of this study reveal that both teachers and learners have positive attitudes towards the integration of AI-powered personalized learning for the development of the writing skill. Additionally, both believe that such technology should be used as a supplement for better, effective, and successful implementation. Finally, this study concludes by presenting a number of limitations such as the small size of the sample and the exclusive focus on third year students. Additionally, some recommendations are presented for pedagogy including raising the students' awareness of the potential risks of using AI-powered personalized learning tools and designing programs that provide teachers with sufficient training for the effective implementation of such tools.

Keywords: Artificial intelligence, AI-powered personalized learning tools, the writing skill, teachers' perceptions, students' perception, English as a Foreign Language.

List of Acronyms and Symbols

AI: Artificial Intelligence

AIED: Artificial Intelligence in Education

AWE: Automated Writing Evaluation

EFL: English as a Foreign Language

ESL: English as a Second Language

GPS: Global Position System

NLP: Natural Language Processing

Q: Question

%: Percentage

List of Figures

Figure 2.1. The students' gender.....	51
Figure 2.2. Students' choice to study English at university.....	52
Figure 2.3. Students' English level.....	53
Figure 2.4. Students' perceptions of the importance of the writing skill.....	54
Figure 2.5. Students' writing abilities.....	55
Figure 2.6. Students' satisfaction with their writing level.....	56
Figure 2.7. Challenges faced by students when writing.....	57
Figure 2.8. Students' writing difficulties.....	58
Figure 2.9. Students' toughest writing stages.....	59
Figure 2.10. Students' satisfaction with the teaching of the writing skill at university.....	60
Figure 2.11. Students' experience with AI tools.....	61
Figure 2.12. Students' frequency of AI tools use.....	62
Figure 2.13. Student' use of AI tools for writing.....	63
Figure 2.14. Students' frequency of using AI tools in writing.....	64
Figure 2.15. Students' preferred AI tools for writing.....	65

Figure 2.16. Students' perception of AI helpfulness.....	66
Figure 2.17. Writing aspects improved by AI.....	67
Figure 2.18. Students' perceptions of the most beneficial AI tools for writing.....	68
Figure 2.19. Students' willingness to recommend AI tools.....	69
Figure 2.20. Teachers' academic degree.....	73
Figure 2.21. Teachers' teaching experience.....	74
Figure 2.22. Teachers' perception of the importance of the writing skill.....	75
Figure 2.23. Teachers' assessment of students' writing ability.....	76
Figure 2.24. Teachers' opinion of the difficulty of writing for students.....	77
Figure 2.25. Common challenges observed in students' writing.....	78
Figure 2.26. Teachers' insight on the most difficult writing stages.....	79
Figure 2.27. Teachers' integration of AI tools in class.....	80
Figure 2.28. Teachers' motivational assessment of AI tools.....	84
Figure 2.29. Teachers' report on student progress using AI tools.....	85

Table of Contents

Dedication.....	3
Acknowledgements.....	5
Abstract.....	6
List of Acronyms and Symbols.....	7
List of Figures.....	8
Table of Contents.....	10

General Introduction

1. Statement of the Problem.....	16
2. Aim of the Study.....	17
3. Significance of the Study.....	17
4. The Research Questions.....	17
5. Population and Sample.....	18
6. The Research Tools.....	18
7. Structure of the Dissertation	18

Chapter One: The Writing Skill and AI-Powered Personalized Learning

Introduction.....	20
-------------------	----

1.1. The Writing Skill in EFL Context

1.1.1. Definition of the writing skill.....	21
1.1.2. Significance of the writing skill in EFL learning.....	22
1.1.3. Components of the writing skill.....	23
1.1.3.1. Syntax.....	23
1.1.3.2. Word Choice.....	24
1.1.3.3. Coherence and Cohesion.....	24
1.1.3.4. Mechanics.....	25
1.1.3.5. Style and Tone.....	26
1.1.3.6. Organization and Structure.....	27
1.1.4. Approaches to Teaching Writing.....	27
1.1.4.1. The Product-based Approach.....	28
1.1.4.2. The Process-based Approach.....	29
1.1.4.3. The Genre-based Approach.....	30
1.1.5. The Process of Writing.....	31
1.1.5.1. Pre-writing.....	31
1.1.5.2. Drafting.....	32
1.1.5.3. Revising.....	33
1.1.5.4. Editing.....	34
1.1.6. Common Challenges in Writing for EFL Learners.....	34
1.1.7. Assessing Writing	36
1.1.8. The Use of AI in Writing.....	37

1.2. AI-Powered Personalized Learning

1.2.1. Definition of Artificial Intelligence.....	38
1.2.2. Types of Artificial Intelligence.....	38
1.2.2.1. Traditional AI.....	38
1.2.2.2. Generative AI.....	39
1.2.3. The Nature of AI-powered Personalized Learning.....	40
1.2.4. Traditional vs. AI-powered Personalized Learning.....	40
1.2.5. The Application of AI-powered Personalized Learning in Academic Writing.....	42
1.2.6. AI-powered Personalized Learning Tools for Writing.....	43
1.2.7. Benefits of AI-powered Personalized Learning in Writing.....	44
1.2.8. Challenges of implementing AI-powered Personalized Learning Tools.....	45
Conclusion.....	47

Chapter Two: Exploring the Use of AI in Writing : The Field Work

Introduction.....	48
2.1. The Research Aim.....	48
2.2. The Research Questions.....	48
2.3. Data Collection Tools.....	49
2.3.1. The Students' Questionnaire.....	49

2.3.1.1. Aim of the Questionnaire.....	49
2.3.1.2. Sample and Population.....	49
2.3.1.3. Administration of the Students' Questionnaire.....	50
2.3.1.4. Description of the Students' Questionnaire.....	50
2.3.1.5. Analysis of the Results.....	51
2.3.1.5.1. Background information.....	51
2.3.1.5.2. The Writing Skill.....	54
2.3.1.5.3. AI-Powered Personalized Learning and Writing.....	61
2.3.1.5.4. Recommendations and Feedback.....	69
2.3.1.6. Discussion of the Students' Questionnaire.....	71
2.3.2. The Teachers' Questionnaire.....	72
2.3.2.1. The Aim of the Questionnaire.....	72
2.3.2.2. Sample and Population.....	72
2.3.2.3. Administration of the Teachers' Questionnaire.....	72
2.3.2.4. Description of the Teachers' Questionnaire.....	73
2.3.2.5. Analysis and Discussion of the Results.....	73
2.3.2.5.1. Background Information.....	73

2.3.2.5.2. The Writing Skill.....	76
2.3.2.5.3. AI-Powered Personalized Learning and Writing.....	81
2.3.2.5.4. Recommendations and Feedback.....	83
2.3.2.6. Discussion of the Teachers' Questionnaire.....	88
2.4. Discussion of the Main Findings.....	89
2.5. Limitations and Recommendations.....	91
2.5.1. Limitations of the Study.....	91
2.5.2. Recommendations.....	92
2.5.2.1. Recommendations for Pedagogy and Research.....	92
2.5.2.2. Recommendations for EFL Teachers.....	92
2.5.2.3. Recommendations for Students.....	93
2.5.2.4. Recommendations for Curriculum Development.....	93
2.5.2.5. Recommendations for Future Research.....	94
Conclusion.....	94
General Conclusion	
References.....	97
Appendices.....	113
Appendix A: The Students' Questionnaire.....	113

Appendix B: The Teachers' Questionnaire.....	117
ملخص.....	121
Résumé.....	122

General Introduction

1. Statement of the Problem

In the context of English as a Foreign Language (EFL), developing the writing skill is indispensable. The development of the writing skill involves having a good command over different aspects including the correct use of grammar, expressing ideas logically in a smooth way, and employing a wide range of words appropriately. For EFL learners, being a proficient writer is crucial. Academically, the writing skill is considered as a priority when it comes to essays, research papers, and exams. Moreover, it helps learners to become critical thinkers who are able to organize their thoughts, analyze information, and present arguments logically. Above all, proficient writing allows for effective communication not only in the academic settings but also beyond the educational environment.

EFL learners often face significant challenges in developing their writing skill, primarily due to a significant lack in personalized feedback and well-tailored learning experiences in traditional teaching methods and their limited adaptability. This gap seems to be bridged by the introduction of AI-powered technologies. Coming with the power of natural language processing, individualized feedback, and adaptive learning experiences, AI-powered personalized learning has radically changed the whole equation of the EFL learning journey, primarily helping learners to overcome various obstacles resulting from traditional practices. Although the implementation of such technologies seems to be a promising solution concerning the development of the writing skill, students' and teachers' perceptions about their use are still insufficiently covered. Therefore, this study seeks to explore the perceptions of EFL students and teachers at Mila University Center in order to gain insight into the different aspects of using AI-powered learning tools in writing.

2. The Aim of the Study

This study aims at exploring both EFL students' and teachers' perceptions of the use of AI-powered personalized learning tools in the development of the writing skill. By investigating these perceptions, this study seeks to gain insight into the effectiveness of using AI in enhancing the skill under focus.

3. Significance of the Study

Providing a thorough exploration of how EFL students and teachers perceive the use of AI-powered personalized learning tools for the improvement of the writing skill, this study attempts to discover the intricacies of the implementation thereof. It also provides insight into the learning experiences AI-personalized learning adds to the students' learning journey, which in turns can inform instructors' and developers' future decisions concerning the use of AI technologies in EFL instruction.

4. The Research Questions

To achieve the aforementioned aim, this research seeks to answer the following questions:

1. What are EFL students' perceptions of the use of AI-powered personalized learning tools for the enhancement of the writing skill?
2. What are the teachers' perceptions thereof?
3. To what extent do students use AI-powered personalized learning tools for improving their writing skill?
4. What are the different AI-powered tools students use to refine their writing skill?

5. Population and Sample

The population selected for this study is Third-year EFL students at Mila University Center. The reasons for selecting this population in particular is that third year students, compared to first and second years, are generally expected to have more experience concerning learning the English language and developing the writing skill specifically. Moreover, as they have been developing the writing skill for two years at university, it is likely that third year students have been exposed to various AI-driven writing tools all over the past two years. Most importantly, third year students are assessed primarily through essay writing, which makes writing a skill of paramount importance to them. The population also involves 15 EFL teachers at Mila University Center. The sample size will involve 70 learners and 15 teachers, ensuring a robust representation of perspectives and practices.

6. The Research Tools

In order to gather the necessary data, two questionnaires are designed: the first questionnaire is administered to third-year EFL students at Mila University Center, while the second one is distributed to teachers in the Department of Foreign Languages at the same University Centre.

7. Structure of the Dissertation

The current study consists of two chapters. The first chapter is theoretical, consisting of two main sections. The first section, entitled the writing skill, aims at reviewing the literature related to the targeted skill. It starts with a range of definitions of the writing skill as well as its importance, main components, process, and main approaches to teaching it. The section also explores the main challenges that the writing skill imposes as well as its

assessment. The second section covers AI-powered personalized learning and the concomitant tools.

The second chapter is devoted to the methodology of the research; it contains a detailed description of the field work. In this chapter, the two questionnaires are thoroughly described, the data are analyzed, and the results are discussed, in an attempt to accomplish the aim of the study. The chapter ends with a discussion of the main findings along with an account of the limitations and recommendations, based on the research outcomes.

Chapter One: The Writing Skill and AI-Powered Personalized Learning

Introduction

The introduction of Artificial intelligence (AI) technologies has marked a major shift in traditional teaching and learning methodologies. In English as a foreign language (EFL) specifically, AI has become a transformative force as it offers unmatched opportunities to adapt instruction to the learners' individual needs. Personalization is of great importance particularly in the development of the writing skill which is considered as the most difficult skill that not only requires linguistic competence but also creativity, critical thinking, and continuous feedback. No doubt, a one-size-fits-all approach falls short in addressing the students' individual needs and strengths as their abilities, learning styles, and progress are diverse. Introduced as a new paradigm, AI-powered personalized learning offers a promising solution, providing adaptive instructional techniques to customize each learner's writing development journey.

This chapter explores the role of AI-powered personalized learning in enhancing learners' writing skill. It is divided into two main sections. The first section aims to provide a theoretical background on the writing skill. It begins by defining it and discussing its importance to EFL learners. The section also uncovers the components of the writing skill, including syntax, word choice, coherence and cohesion, mechanics, style and tone, and organization. In addition, it introduces the three main approaches to teaching the writing skill namely the product-based, the process-based, and the genre-based approaches. Moving forward, the section touches upon the phases of the writing process, in addition to the challenges faced by EFL learners. Lastly, the section concluded by discussing the assessment of the writing skill as well as introducing the use of AI in writing.

The second section aims to discuss the concepts related to AI and personalized learning, with a special focus on the writing skill. It starts with introducing the notion of AI by providing definitions and highlighting its two main types. The section then moves to exploring the nature of AI-powered personalized learning, while providing a range of definitions. Subsequently, a comparison is made between traditional personalization and the one offered by AI, making a clear distinction between the two paradigms and the features they provide. Next, the section dives into the application of AI-powered personalized learning, highlighting the tools that help personalizing the writing development process. The section brings the chapter to a close by discussing the benefits, as well as the challenges of applying AI-personalized learning as a technique to enhance EFL learners' writing skill.

1.1. The Writing Skill in EFL Contexts

1.1.1. Definition of the Writing Skill

In language learning, writing is considered one of the fundamental skills alongside listening, speaking, and reading. In the realm of academic research, scholars have viewed the writing skill from different angles, resulting in various definitions. Writing is a skill that should be taught and learned. In this vein, White (1981) stated that all physically and mentally normal people learn to speak a language; writing is not a natural activity, rather it is one that is learned and taught. Hyland (2016) defined the writing skill as a learned ability to produce meaningful, structured, and purposeful texts through the deliberate application of linguistic and cognitive strategies. Highlighting how writing demands both technical control and purposeful composition. Unlike innate talents, writing is a trainable skill that improves with practice, feedback, and exposure to models. According to Nunan (1989),

Writing is an extremely complex cognitive activity in which the writer is required to demonstrate control of a number of variables simultaneously. At the sentence

level, these include control of content, formats, sentence structure, vocabulary, punctuation, spelling, and letter formation. Beyond the sentence, the writer must be able to structure and integrate information into cohesive and coherent paragraphs and texts. (p. 36)

Holding a similar view, Bazerman (1988) noted that writing is not merely a transcription of thought but a complex interaction between the writer's intentions and the sociocultural norms of discourse communities. Additionally, in the view of Widdowson (1978), "we may say that writing is the act of making up correct sentences and transmitting them through the visual medium as marks on paper" (p. 62). All in all, writing is not merely collecting words together, but it is a systematized cognitive activity through which thinking is made visible; it reflects the depths of one's understanding and clarity of thought.

1.1.2. Significance of the Writing Skill in EFL Learning

The writing skill is considered as an indispensable requirement for EFL learners. As Ghosh et al. put it, "Writing is meant for conveying thoughts, ideas, and facts in easy and lucid language. Students have to learn the art of good writing which is essential in order to excel at both academic and professional levels" (2021, p. 27). Regarding academic activities, Bacha (2002) stated that "writing is significant in student's academic course of study as most examinations, reports and research work depend on it" (p. 164). Thus, students need to know how to write competently to successfully complete their coursework and express themselves well for higher education. This can be possible through accomplishing assignments such as essays, research papers, and tests.

In addition, Reid (1933, as cited in Gautam, 2019) argued that the writing skill possesses an invaluable importance for the sake of enabling students to understand how the distinct components of a language harmoniously act together. That is to say, students can

attain an overall linguistic proficiency by means of a proper development of the writing skill. In this context, Javed et al. (2013) argued that writing is one of the fundamental skills in English language learning; it enables students to reinforce the grammatical structure and enhance their vocabulary. Moreover, as noted by White (1986): “because writing is a way of learning, you can actually achieve deeper insights into any subject by writing out your thoughts” (p. 15). This suggests that writing as a skill contributes significantly to the overall advancement of learning endeavors. Eventually, the writing skill embeds the role of a thinking tool.

1.1.3. Components of the Writing Skill

1.1.3.1. Syntax

Syntax denotes arranging the placement of words and phrases to create well formed, and grammatically sound sentences. Oxford University Press (n.d.) defines syntax as “the arrangement of words and phrases to create well-formed sentences in a language.” Moreover, syntax regulates the phrase structure, the word order, and the connections between the various sentence components. As mentioned in Together in Literacy (2023): “Syntax is the arrangement of words and phrases that create a well-formed sentence.”. Furthermore, since syntax has a direct impact on tone and sentence clarity, mastering it is essential for producing readable and powerful writing. As Williams (2005) argued, syntax is the structural foundation of writing; without it, meaning collapses. By applying proper syntax, writers can effectively communicate their thoughts while avoiding ambiguity and confusion. Eventually, syntax analysis can influence writing by enhancing the phrases flow, readability, turning complicated sentences into fluent and interesting ones.

1.1.3.2. Word Choice

Word choice refers to the idea of choosing specific words depending on what's going to be written. However,

the definition of word choice extends far beyond the simplicity of 'choosing the right words.' Choosing the right word takes into consideration many different factors, and finding the word that packs the most punch requires both a great vocabulary and a great understanding of the nuances in English.

(Writers.com, 2023, "What is Word Choice in Writing?" section)

Moreover, word choice, or diction, is crucial for meeting clarity and achieving the communication purposes in writing. That is to say, "if you use the wrong word, you can confuse your reader or even inadvertently cause offense" (Scribophile, n.d., "What is Word Choice?" section). Selecting the appropriate words guarantees that the intended meaning is accurately delivered while avoiding ambiguity and misunderstanding. Additionally, effective word choice shapes tone and style, allowing writers to adapt their language to suit different audiences and contexts. For instance, narrative writing usually uses expressive language to engage readers emotionally, whereas academic writing mainly requires specific, direct terminology for precision, with commitment to avoid overly complex or ambiguous vocabulary that might hinder understanding; instead, it focuses on simplicity and directness.

1.1.3.3. Coherence and Cohesion

Coherence and cohesion are two main elements that play a crucial role in enhancing readability and conveying ideas effectively. To elaborate, "In English composition, coherence or cohesion describes how harmoniously different parts of a text connect to one another.

Writers show coherence when they make sense of their ideas as a whole.” (The Building Blocks of Academic Writing, 2020, “Tone and Style,” p. 5).

On one hand, cohesion indicates the logical organization of thoughts and ideas within a text, ensuring that the arguments move smoothly from one point to another. Grabe and Kaplan (1996) stated that coherence is reader-dependent, a text may be cohesive but incoherent if ideas do not develop from a logical progression. For Halliday and Hasan (1976), a coherent text is one in which the reader can perceive a consistent line of argument, supported by explicit connections between ideas.

On the other hand, cohesion complements coherence by connecting phrases and sentences through the use of linguistic devices such as transition words, pronouns, and coordinating conjunctions. Halliday and Hasan (1976) identified cohesion as the grammatical and lexical linking within a text. Together, coherence and cohesion make the written text more engaging for readers and easier to follow. Without these two elements, the written texts may appear fragmented, disconnected, or confusing for the audience, decreasing their overall effectiveness.

1.1.3.4. Mechanics

Heaton (1988) clarified that the mechanics of writing refer to the writers’ ability to use correctly conventions peculiar to the written language such as punctuation and spelling. To push further, they denote the technical aspects of writing, including grammar, punctuation, capitalization, spelling, and formatting. Writing mechanics are essential for maintaining consistency with the regular standards of the linguistic use. Truss (2003) pointed out that a good punctuation is crucial for clarity. It signals relationships between ideas and guides the reader’s interpretation. Furthermore, when mechanics are missing, reading or listening are disoriented, and may negatively affect the writer’s credibility. Thus, paying

attention to mechanics improves readability and professionalism in academic and professional contexts.

1.1.3.5. Style and Tone

Style refers to the individual traits or characteristics of a piece of writing. It is a writer's particular way of writing words that readers recognize (Del Mar College Student Writing Center, n.d., p. 1). In the same context, Pinker (2014) held that style is the effective use of words to engage the human mind. It is the unique way in which a writer tries to express ideas in relation to the subject matter or audience. The aforementioned two elements may require formal, informal, persuasive, or neutral tones. As for tone, it may be defined as:

the expression of the author's attitude. Like the tone of voice in a character, the tone of a story may communicate amusement, anger, affection, sorrow, or contempt. However, tone is more than just how a character says something. When instructors ask, 'What is the tone of the story?' they usually mean, 'What attitude does the author take toward a theme or a subject?'

(Del Mar College Student Writing Center, n.d., p. 1)

To cut it short, both style and tone depend on the writer's purpose and audience expectations. For instance, "When writing an email to a friend, for example, you may choose to use an informal or colloquial tone, whereas an essay for an English class requires an academic tone" (The Building Blocks of Academic Writing, 2020, "Tone and Style," p. 1). For further elaboration, academic writing is typically formal in tone with objective language, while creative writing is more typically conversational, and designed to be personal to the reader.

1.1.3.6. Organization and Structure

Effective organization is the process of arranging ideas in a logical manner and a well-defined structure including an introduction, body paragraphs, and a conclusion (Brown, 2004). Additionally, organization demands the use of an appropriate title, effective opening paragraphs, topic statements, use of transitional expressions, arranged materials through planning, and logical and complete conclusion. Brown also stated that organization includes the effectiveness of the introduction, the logical sequence of ideas, the conclusion, and the appropriate length of each piece. In brief, organization in writing is a crucial element that has an important role in providing the audience with an easiness to understand the written text.

Structure ensures that each section serves its purpose whether by introducing the topic clearly, elaborating on arguments systematically, or summarizing key points effectively, creating a well-organized piece of writing that allows readers to navigate the content effortlessly while maintaining engagement. Similarly, The Naval Postgraduate School's Graduate Writing Center (n.d.) mentioned:

When assessing a paper's structure, we're less concerned with the grammar or mechanics of individual sentences, but focus instead on sections, subsections, or paragraphs. [...] Writing well-structured papers requires us to be familiar with the common elements of academic writing. It is important to be able to assess the strength of introduction and conclusion, thesis statement, and topic sentences.

1.1.4. Approaches to Teaching Writing

There are various approaches to teaching writing. Three major ones are: the product-based approach, the process-based approach, and the genre-based approach. Each approach views the writing skill from a different perspective.

1.1.4.1. The Product-based Approach

The product-based approach to writing is based on the principle that “essentially, writing is seen as a product constructed from the writer’s command of the grammatical and lexical knowledge, and writing development is considered to be the result of imitating and manipulating models provided by the teacher” (Hyland, 2003, p. 3). This indicates that, this approach deals with writing as a final output, focusing on grammar and vocabulary as well as imitation of the models provided by the instructor rather than the writing process itself.

Additionally, the product-based approach refers to a practice where writing as an end product is emphasized. This practice regularly involves the use of a model text that the students are asked to imitate (Gabrielatos, 2002). In order to apply this approach, four steps are suggested by Steele (2004). Firstly, students are required to read the model and take notes on its distinctive features which are organization, the use of language, and mechanics of writing. Secondly, Students engage in structured exercises to practice the features identified in the model text. Additionally, students try to imitate the model essay by arranging predetermined ideas in accordance with the model’s structure. Finally, based on their developed linguistic repertoire, learners write the anticipated composition through deliberate application of grammatical forms and vocabulary.

Ultimately, the product-based approach to teaching writing is beneficial in various ways (Xu, 2005). To start with, the approach emphasizes the significance of providing students with a good understanding of language in texts. This assists them to clearly grasp the structure and organization of well written pieces. Secondly, as the method encourages imitation as a learning strategy, it helps students in the acquisition of knowledge. Lastly, the product approach contributes significantly in enhancing students’ use of vocabulary and sentence structure. Although the approach offers various advantages, it received criticism for

several reasons. According to Hedge (2000), it limits students' creativity and self-expression for they have little control over the content and style of their writing. In the same vein, Badger and White (2000) argued that the approach tends to neglect the importance of the audience and the communicative purpose of writing as students often write just to practise grammar rather than for a real purpose.

1.1.4.2. The Process-based Approach

Unlike the product-based approach which focuses mainly on the end product, the process-based approach as the name suggests gives great importance to the writing process. According to Harmer (2007), "the process-based approach emphasizes how the writing emerges as the result of a distinct process which advances through several stages until the writing is complete" (p. 326). In other words, this method highlights the process of how ideas are developed during writing rather than the final written product. Following this approach, students are encouraged to understand and follow different stages involved in creating a piece of writing. The process of writing includes four different sub-processes: planning, drafting, revising, and editing. According to Appelle (1986, as cited in Kroll, 1990), the process approach provides a technique to think about writing in terms of what the writer does instead of what the final product seems to be.

Additionally, according to Murray (1992, as cited in Nemouchi, 2008): "the process-oriented approach may include identified stages of the writing process such as: pre-writing and revising. Once the rough draft has been created, it is polished into subsequent drafts with the assistance of peer and teacher conferencing" (p. 16). The quote highlights the idea that in classrooms which adopt the process-based approach teachers help students start writing by using prewriting activities. That is to say, students are encouraged to write multiple drafts and make revisions in groups, promoting collaboration. In the same context, Maarof et al. (2011)

stated “teacher feedback is regarded as a main requirement for improvement in students’ essay writing” (p. 30). This indicates that the teacher’s main aim is not only to produce students who can write well, but also to help them become independent writers who understand their own writing process. Thus, students should be able to manage their own unique writing process (Flower, 1985). In order to support and achieve this goal, the classroom should offer a positive, supportive, and collaborative atmosphere where students are given enough time and freedom to develop their writing. The role of the teacher is to guide and assist students through each stage of writing. Teachers can scaffold students by helping them choose topics and organize ideas, encouraging them to write and rewrite drafts, guiding them through revisions, and supporting them to finally edit their work by focusing on vocabulary, grammar punctuation, and spelling.

1.1.4.3. The Genre-based Approach

The genre-based approach is one of the new teaching approaches to writing. This approach highlights the importance of teaching different types of texts. Hamer (1998) argued that it encourages students to primarily read and analyze examples of the genre they are expected to write. For instance, if students are learning to write business letters, they should be provided first with a sample letter. This promotes them to study its structure and the language before attempting to write their own. Badger and white (2000) stated that the genre approach views “writing as predominantly linguistic but, unlike product approaches, they emphasize that writing varies with the social context in which it is produced” (p.155). This suggests that the genre approach shares some key features with the process approach as both highlight the importance of understanding the way in which language is used in writing. However, the genre approach differs since it takes into consideration the social context of the writing task.

The genre approach offers numerous advantages. Firstly, it helps students become familiar with a range of sentence structures used across different types of writing. The goal of this approach is to help learners gain knowledge of specific genres and the communicative purposes behind them, enabling them to effectively engage with different audiences. This view is supported by Elashri (2013) who argued that students need to be exposed to various examples of one genre to develop the ability to write using that genre.

Similar to the other approaches, the genre approach has a number of drawbacks. One of its limitations lies in the possibility that the learners may struggle if they lack a strong foundation in grammar and language structure, hindering their ability to reach the target audience. Badger and White (2000) stated that: “Different genres require different kinds of knowledge and different sets of skills, and our knowledge of both the knowledge and skill involved in different genres is limited” (p. 158). In the same vein, Badger and White (2000) mentioned that the negative aspect of the genre approaches is that they view learners as largely passive and neglect the required skills to produce a text. Furthermore, as the approach focuses on the product of writing, it may overlook the importance of the writing process itself.

1.1.5. The Process of Writing

1.1.5.1. Pre-writing

Pre-writing is the first step on the writing process, and its purpose is to generate the content and structure of the writing yet to come. To elaborate,

Prewriting is anything you do before you write a draft of your document. It includes thinking, taking notes, talking to others, brainstorming, outlining, and

gathering information. [...] Although prewriting is the first activity you engage in, generating ideas is an activity that occurs throughout the writing process.

(MIT Writing and Communication Center, n.d., "The Writing Process" section).

Additionally, effective writing requires careful planning around three essential elements: purpose, audience, and content structure. (Axelrod & Cooper, 2020). Firstly, writers must clarify their purpose as it dictates the text type, language style, and information selection. Secondly, consideration of the intended audience influences both structural components (layout, paragraph organization) and linguistic choices (formal/informal register). Thirdly, writers must strategically sequence facts, ideas, or arguments for optimal flow. Prewriting, also termed planning, provides crucial benefits: it gives direction by breaking the task into manageable stages, creates measurable progress indicators, prevents overwhelming feelings about the writing process, and enhances reader comprehension through coherent organization. According to Flower and Hayes (1981), planning is the bridge between chaos and coherence. In conclusion, this foundational planning stage helps writers maintain focus on their topic while properly addressing purpose, audience expectations, and structure, for achieving successful written communication.

1.1.5.2. Drafting

The second stage of the writing process is drafting, where ideas take shape in a complete but unpolished written form. As King (2000) observes, the initial draft primarily serves as the author's means of discovering and articulating the narrative to themselves. Drafting is, actually, the first step in the process of writing any kind of texts. During this initial phase, writers compose their opening paragraphs for the first time. This draft is largely the 'rough draft' that serves only as a working document until it is reworked to fit the author's needs. The writer then sets aside the initial draft until reaching the final revision

stage. Moreover, the drafts of a writing project are usually made in stages all through the process of writing an entire text. However, some authors produce at least four or five drafts during the development of some written piece such as a book. In fact, drafting works best when authors focus primarily on content creation with an outline or diagram to help guide the structure without worrying about “mechanical problems” such as punctuation or grammar (Elbow, 1973).

1.1.5.3. Revising

Revision is the process of critically changing drafts of writing in order to improve the content, the organization, and the clarity of the text. Sommers (1980) noted that revision is not polishing, and that instead it is rethinking. The process of revising begins by carefully reviewing and analyzing the written piece like identifying missing information, improper wording or structuring, unclear ideas or examples, or weak central ideas, and then making significant changes like rewriting introductions, rearranging content, adding important or missing details, and deleting unimportant material. It also goes through several steps. As skilled writers will likely point out, the big picture aspects such as thesis development, argument flow, overall coherence come first, before sentence level issues (word choice, grammar and mechanics).

Moreover, the process of revision can take a number of iterations, with writers switching between looking at the big picture aspects and working on the detail. External feedback is crucial in later stages, when peer or editor input can help identify problem areas and help identify improvements that the author may otherwise overlook. To conclude, the overall goal of revision is to create a piece of writing that meets all of the quality criteria: logical organization, clear development, appropriate vocabulary, grammatical and mechanical precision, all working together to communicate ideas effectively

1.1.5.4. Editing

Editing is the next step in the process of completing a written work on the which the writer rewriting and try to enhance their writing at the micro level. Zinsser (2006) suggested that editing is the art of making the text say what it means to say, clearly and elegantly. Additionally, editing is a high-quality process that considers all the grammatical aspects of a piece of writing, including punctuation, grammar, spelling, technical issues with the writer's writing, and sentence clarity like eliminating unnecessary words and making the sentences more concise. Ultimately, editing helps to ensure an improved overall quality of the text as it sharpens its language and allows the writer to engage the targeted audience.

1.1.6. Common challenges in writing for EFL learners

Writing in English is considered a challenging task especially for foreign language learners. Bell and Burnaby (1984) viewed the writing skill as an extremely complex cognitive activity that requires the writer to demonstrate control of a number of variables simultaneously. In this context, Hyland (2003) stated that writing is considered one of the most difficult skills to master in the process of learning a foreign language. It requires not only accurate language structure and use but also the potential of communicating ideas effectively. Perceived as a complex cognitive activity, writing involves memory, critical thinking, and strong language skills to express thoughts in a clear organized way.

Research on the challenges of writing in English as a foreign language has revealed a number of difficulties that learners commonly face when attempting to improve their writing skills. Alzahrani et al. (2021) found that EFL learners often struggle with mechanics, vocabulary usage, and text organization. Other studies have emphasized that EFL learners frequently encounter difficulties in generating ideas, structuring their thoughts, and converting them into logically organized written texts (Srouf et al., 2021). Additionally,

research comparing process-based and product-based approaches to writing instruction consider writing as the most difficult language skill for EFL students to master as it requires cognitive, metacognitive, and affective engagement at different levels (Kadmiry, 2021). As Heaton (1975) states, “the writing skills are complex and sometimes difficult to teach, requiring mastery not only of grammatical and rhetorical devices but also of conceptual and judgmental elements”. For him, the writing is complex and difficult skill to learn, as it requires not only grammatical competence but also the integration of diverse cognitive and conceptual abilities. These include:

- mechanical skills: the ability to use correctly those conventions peculiar to the written language-e.g., punctuation, spelling;

- treatment of content: the ability to think creatively and develop thoughts, excluding all irrelevant information

- stylistic skills: the ability to manipulate sentences and paragraphs, and use language effectively;

- judgmental skills: the ability to write in an appropriate manner for a particular purpose with a particular audience in mind, together with an ability to select, organize and order relevant information.

(Heaton, 1975, p. 135)

Pushing further, Weir (1988) outlined some challenges that EFL and ESL learners encounter in learning writing. These include: frequent grammatical errors, lack of variety in grammatical structures used, and the inappropriate use of vocabulary. Additionally, learners are hindered by spelling, punctuation, clear self-expression, and insufficient understanding of the topic, besides minor issues such as poor handwriting and overall untidiness.

1.1.7. Assessing Writing

Assessing the students' writing is a cornerstone of effective writing instruction that requires consistent observation, analysis, and reflection. Assessment is not simply a question of evaluating finished product, it's an understanding of how students write, what they do in writing, and where they need to be guided to grow. Strickland & Strickland (2000), write: "Assessment gets to the heart of teaching and lets us decide how and when to offer support to writers" (p. 66). In other words, the heart of writing assessment is the authority to know what a student knows and can do independently, and what a student requires assistance with. When assessing students' writing, teachers mainly look for how students structure their writing, what type of details they utilize, and how they construct meaning for their readers. For example, some students may be well-organized but struggle to maintain academic tone in their writing; others may use rich descriptions but need help with grammatical rules.

Additionally, listening carefully and asking reflective questions can enable teachers to determine students' understanding of the writing craft and proficiency in employing specific techniques. As emphasized by Black and Wiliam (1998), formative assessment is most effective when teachers engage in active listening and targeted questioning to uncover student thinking. Moreover, assessment allows teachers to provide immediate, focused feedback that addresses misconceptions and introduces new strategies at the time when students are most ready to learn and apply them. Hattie (2012) underscored this, noting that educational studies emphasize that feedback has the greatest impact when it is timely, specific, and directly tied to learning objectives.

Furthermore, the most effective writing assessment is a regular and ongoing one, embedded in the daily rhythm of the classroom. Shepard (2000) argued that when assessment is deeply integrated into instruction, it shifts from being a passive measurement to an active

force that enhances learning. Teachers can take notes on observations and analysis of work, allowing them to track progress over time and make changes in instruction accordingly. This aligns with the view that writing assessment should be a continuous process, where teachers adjust their methods based on real-time student needs (Calkins, 1994). When assessment is embedded in classroom practice in this way, it becomes not only an indicator of learning but a force that shapes and enriches the learning process itself.

Finally, writing assessment is a matter of understanding students as autonomous writers and using what is known about them to steer them toward growing competence and confidence. Effective assessment requires teachers to recognize students as independent writers and tailor instruction to build both their skills and self-assurance (Graves, 1983). It demands teachers to become observers, sensitive examiners, and responsive instructors capable of meeting special needs and whole-class goals, in order to create a writing class in which instruction is narrowly aimed, feedback productive, and every student receives the direction they need to grow as a writer. As Johnston (2004) suggested, assessment should not just inform teaching, it should actively reshape it to address both individual and collective growth

1.1.8. The use of AI in writing

EFL writers often experience language problems and struggle to write in English. According to research, computer writing support helps in improving writing skills in English (Nobles & Paganucci, 2015). Artificial intelligence-based writing software, in particular, have the potential to assist their users in their writing tasks (Barrot, 2020; Coenen et al., 2021) and improve their writing ability, while cultivating their independent learning (Pokrivcakova, 2019; Nazari et al., 2021). However, most writing support is geared toward the editing and revising phase, like offering similarity reports and grammar correction

(Winans, 2021). How AI programs provide learners with personalized help to pursue their writing tasks remains a question that warrants attention.

1.2. AI-Powered Personalized Learning

1.2.1. Definition of Artificial Intelligence

McCarthy (1997), defines Artificial intelligence (AI) as: “the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence.” It involves designing a computer, a computer-controlled robot, or a software that have human-like intelligence. Similarly, Russell and Norvig (2021) defined AI as the simulation of human intelligence by computers and machines in an attempt to perform tasks such as learning, reasoning, and problem solving. Indeed, the technology of AI is achieved by studying the way in which the human brain thinks, how humans learn, how they make decisions, and how they solve problems. The results of such studies are used as a foundation of developing intelligent software and systems.

1.2.2. Types of Artificial Intelligence

There are two main types of AI: traditional AI and generative AI. To see how they are different, one must examine what each does and how both are transforming our world.

1.2.2.1. Traditional AI

Traditional AI, also termed Narrow AI or Weak AI, is a form of artificial intelligence designed to perform specific tasks using preprogrammed rules and algorithms. As Marr (2023) suggested, “Traditional AI, often called Narrow or Weak AI, focuses on performing a specific task intelligently. It refers to systems designed to respond to a particular set of inputs.

These systems have the capability to learn from data and make decisions or predictions based on that data.” Russell and Norvig (2021) explained that traditional AI systems are similar to specialist experts; they can do certain tasks well and they have learned to do so. In fact, they are able to examine information, detect patterns, and even forecast, but all within highly limited parameters. For instance, the AI that powers the email spam filter or the automobile's GPS uses rigid rules and algorithms to get the job done. Other examples of narrow AI include voice assistants, image recognition systems, and recommendation algorithms. These models are effective at categorizing data, charting directions, or detecting fraud but are unable to do anything outside of their parameters.

1.2.2.2. Generative AI

Generative AI is a leap forward in the history of AI. It is a subset of AI that focuses on creating new content by learning patterns from existing data, ensuring that the output closely resembles real-world examples. Unlike traditional AI that primarily focuses on recognizing patterns or making predictions, generative AI models are designed to produce novel and realistic outputs based on the patterns and the structures learned from training data. Bommasani et al. (2021) argued that generative AI is unlike its predecessor that only examines data, in that it can create new content whether it be essay writing, music composition, or realistic image generation. This incredible capacity is a byproduct of large language models trained on vast amounts of data, allowing them to make predictions and generate human-like responses.

With these exciting prospects, however, come actual challenges. The ability of generative AI to generate good content has been a problem concerning originality and authenticity. One may wonder how teachers would know if a student has written his essay himself or using AI. How do humans rely on content generated by such systems when they, at

times, give credible but false answers? These are the kinds of questions educators and policymakers are attempting to come to terms with as this technology proliferates.

1.2.3. The Nature of AI-powered personalized learning

In this era, Artificial Intelligence (AI) has revolutionized various sectors, and education is no exception. One of the most notable contributions that AI has brought to the educational field is the development of AI-powered personalized learning. Personalized learning can be defined as an approach which focuses on tailoring educational experiences to meet the specific needs, strengths, and interests of each student. Although it has traditionally been a goal in education, the challenges and the resource demands have limited its implementation. However, the introduction of AI has changed this reality, making it increasingly achievable to deploy personalized learning at scale (Khan & Jian, 2023). AI-based personalized learning is the use of AI technologies aiming to introduce customized educational experiences adapted to the needs, preferences, and abilities of every learner (Parvez, 2024). Employing sophisticated algorithms, AI-driven learning platforms continuously tailor the content, pace, and difficulty level according to each learner's individual needs and progress. Essentially, students' interactions with the educational content get analyzed and accordingly the algorithms adjust the difficulty and pace of the instructional materials based on the individual performance of each student, providing real-time feedback (OpsMatter, 2024).

1.2.4. Traditional vs. AI-powered Personalized Learning

Personalized learning is a learner-centered strategy that aims at adopting the curriculum and the instructional techniques to align with the unique abilities, interests, and goals of each learner. It emphasizes responsive, and high-quality teaching that caters to diverse learning preferences, fostering students' self-confidence, skill development, and

autonomy. By addressing the individual needs of students, personalized learning not only supports academic excellence but also contributes to educational equity and social justice. According to Pane et al. (2017), “Personalized learning prioritizes a clear understanding of the needs and goals of each individual student and the tailoring of instruction to address those needs and goals” (p. 6). This suggests that personalized learning places the learner at the center of education by first identifying their unique requirements and aspirations

AI has dominated the field of education as it revolutionized the traditional teaching and learning methodologies. As Ayeni et al. (2024) put it, “Personalized learning, a cornerstone of AI in education, is a pedagogical approach that tailors instructional content, pace and assessment to meet the specific needs of each learner” (p. 262). As an area of information technology, AI-powered personalized learning can boost the educational process, making it more flexible and aligned with the modern needs. For instance, AI can customize the learning materials and tasks based on the knowledge, the level and the learning style of each student. AI systems are able to track the students’ performance, analyze their progress, and suggest the most beneficial ways for them to learn. In addition, AI can monitor their performance, assess it, and provide teachers with detailed insights into each student’s strengths and weaknesses. These virtues reduce the burden on teachers, allowing them to prioritize the provision of quality instruction and constructive feedback (Agatova et al., 2025)

The ability to address different learning styles and individual needs is one of the notable features of personalized learning driven with AI. Traditional methodologies may struggle to tailor instruction to the varied ways in which students learn. However, AI-powered personalized learning platforms can provide various instructional modalities such as visual, auditory, and kinesthetic approaches. This differentiation guarantees that each student can have access to a content that aligns with their learning style, which in turn promotes a more inclusive, effective instructional process (Ayeni, et al., 2024).

Of note, traditionally, feedback is given at stages where it can no longer inform the learner's progress. In this context, Hyland and Hyland (2006) stated that feedback is often provided when the writing task is completed, when students have mentally shifted focus from the writing process. The temporal gap between task completion and feedback reception reduces opportunities for uptake and limits the feedback's pedagogical value. AI, however, provides real-time feedback. This key feature enables students to quickly identify their strengths and weaknesses and adjust the learning techniques accordingly. Not counting exceptional cases, students learn more and better with instant feedback (Yang & Wen, 2023).

1.2.5. The application of AI-powered personalized learning in academic writing

Recently, AI has increasingly been integrated into a huge number of human activities, significantly affecting many aspects of modern life (Kaplan & Haenlein, 2019). AI has proved to be highly effective in resolving complex problems in various domains, and education is one of them. For instance, with the advancements in natural language processing (NLP), it has been feasible to create intelligent chatbots and digital assistants that are able to understand and generate human-like language along with providing multiple correct answers to any kind of questions. Beyond that, the growing interest in the use of AI applications specifically targeting education has generated a specific branch of research referred to as Artificial Intelligence in Education (AIED) (Chen et al., 2020). AIED deals with the application of AI technologies to stimulate the human cognitive capacities like reasoning, judgment, prediction, and decision-making to enhance the teaching and learning processes (Hwang et al., 2020). Furthermore, providing individualized, or say personalized, learning support based on students' performance, interests, and characteristics is one of the primary objectives of AIED (Hwang et al., 2020).

Applying AI-powered personalized learning in education and language classes, including EFL settings, has incredibly revolutionized the teaching of writing by being more sensitive to the individual learner's needs, offering instant feedback, and helping the learner to acquire the different language skills including writing at a personalized pace. In addition to that, AI-driven applications such as automated writing evaluation (AWE) programs are able to check the students' grammar, coherence, and stylistic choices, offering personalized suggestions that are likely to enhance their writing abilities (Zawacki-Richter et al., 2019). Such systems apply NLP to identify patterned errors, predict learning gaps, and recommend targeted exercises by effectively mimicking the guidance of a human teacher (Wilson & Czik, 2021). Moreover, adaptive learning platforms use machine learning algorithms to adapt writing prompts to the student's proficiency level, such that the tasks are always challenging but manageable (Luckin et al., 2016).

However, while critics (e.g., Biesta, 2019; Selwyn, 2020) argue that AI lacks the nuanced intuition of human instructors, proponents (e.g., Luckin, 2018; Xu et al., 2021) demonstrate its potential to democratize writing instruction through scalable, personalized feedback - particularly in resource-limited educational contexts. Lastly, the place of AI in writing instruction is not to replace teachers but to complement them so that they can better fulfill varied learning needs and spend more time on higher-order skills such as critical thinking and creativity (Warschauer, 2020).

1.2.6. AI-powered personalized learning tools for writing

AI-powered personalized learning tools for writing are revolutionizing the education systems and EFL writing classes in a fundamental way by delivering individualized and adaptive support that meets the unique learning needs of students. These consist of applications such as ChatGPT, Grammarly, Quilbot, and Paperpal, which use advanced

machine learning and NLP to provide immediate feedback, correct grammar and vocabulary, and provide suggestions in terms of organization and coherence, thus enabling students to refine their writing skills with unprecedented speed and accuracy (Tsiriotakis et al., 2020). These tools achieve personalization by analyzing user inputs, writing patterns, and error histories to tailor feedback. For example, Grammarly adapts suggestions based on a user's proficiency level and goals (Dizon, 2021). Further example, ChatGPT customizes responses through iterative interaction, simulating one-on-one tutoring (Hwang et al., 2023).

Furthermore, some researchers have shown that writing instruction with the assistance of AI helps not only in enhancing the students' proficiency in various academic writing tasks but also enhances their motivation and self-regulation; this is so since it allows them to write at their own pace with tailored feedback that meets their own writing style and proficiency level (Tsiriotakis et al., 2020). Moreover, adaptive AI writing tools are designed to learn from the users' feedback and increasingly offer more and more personalized, relevant, and improved suggestions over time, which not only facilitates the process of revision but also builds originality and creativity ("Free AI Writing Tool," 2024).

However, some experts warn that AI should help, not replace, human thinking to keep learning honest. Warschauer (2020) argued that students must carefully check AI work to make sure it's trustworthy. Teachers also need to show students how to use AI tools correctly.

1.2.7. Benefits of AI-powered Personalized Learning in Writing

AI plays a pivotal role in customizing the learning experiences to suit the learners' preferences, abilities, and needs as it gathers data on students' performance and accordingly offers personalized learning activities and resources. In writing, AI helps adjusting the

learning materials to each student's distinctive style, which in turn helps them develop their voice as well as improve their technical skill.

There are numerous benefits of AI-personalized writing assistance. AI-driven writing assistance can provide real-time and related feedback (Vorobyava et al., 2025). This allows students to make instant improvements. Secondly, AI-powered educational tools can offer personalized learning, adaptive feedback, and interactive experiences that help students not only enhance computational thinking but also boost their self-efficacy by fostering confidence in solving complex problems (Huang & Qiao, 2024; Chai et al., 2021). Thirdly, AI can optimize learning paths tailored to each student's cognitive and behavioral patterns by analyzing educational big data, including learning histories, logs, and various students' submitted work (Kim, 2023). Moreover, research suggests that AI-driven personalized learning significantly increases students' engagement as well as academic performance (Aviran and Blonder, 2023). For instance, studies indicate that students believe AI chatbots can increase intrinsic motivation by meeting their needs for competence and relatedness (Silitonga et al., 2023).

Lastly, and most importantly, personalized AI-powered tools can adapt to the different learning styles. This helps making instruction more inclusive and accessible. In this vein, Klačnja-Milićević and Ivanović, 2021, reported that adaptive learning systems can be tailored to each learners' individual needs, focusing more on specific topics and reinforcing learning materials that have not been mastered properly. Similarly, in their study, Nguyen et al. (2023 cited in Hussain, 2024) explored how AI technologies cater to varied learners' demographics, particularly individuals with disabilities. The study highlights advancements like speech-to-text and text-to-speech features, which enhance accessibility in educational settings.

1.2.8. Challenges of Implementing AI-powered Personalized Learning Tools

By personalizing learning experiences and delivering real-time feedback, AI is revolutionizing the educational landscape, encouraging a more inclusive and effective learning environment (Kamalov et al., 2023). However, the integration of such technology is accompanied challenges and ethical considerations (Ayeni et al. (2024). Although the transformative potential of AI in personalized learning (PL) bring to in education, the integration of this paradigm presents significant challenges and concerns that require critical attention (Kamalov et al., 2023; Zawacki-Richte et al., 2019; Vorobyeva et al., 2025). Firstly, one of the major concerns about generative AI for personalizing instruction is the risk of over-reliance. While AI can same time and assist with tasks like writing and research, excessive reliance may weaken the learners' critical thinking, effort, and sense of accomplishment in learning (Canales Luna, 2024). Similarly, there a concern “that excessive exposure to such tools may deprive users of the opportunity to develop their writing skills, including skills that are often co-developed with writing such as critical thinking” (Kim & Tan, 2023, p. 1).

Secondly, the success of AI-driven personalized learning depends on gathering and analyzing large amounts of student data, including personal information (like names and demographics), academic performance (such as grades and test scores), and behavioral data (like engagement patterns or online activity) (Katiyar et al., 2024, Moquin, 2024). This raises legitimate concerns about the security and privacy of student data (Katiyar et al., 2024). Balancing the use of AI for personalized learning and protecting personal privacy demands strong data security measures, reliable storage practices, and clear communication regarding how data is used (Butt, et al., 2022, Khosravi, et al., 2022, Malhotra, et al., 2021).

Moreover, AI systems are only as good as the data they were trained on. If the data is biased or incomplete, the AI will amplify or even increase the biases present. This is especially problematic in education, where biased algorithms can influence student assessments and learning outcomes (Ayeni et al., 2024). To prevent this, developers must employ representative and diverse datasets, continuously monitor AI systems, and adjust algorithms to make them fair (Katiyar et al., 2024). Furthermore, While AI can enhance access to education, it can widen existing disparities. AI education relies on stable internet and digital resources, which not everyone possesses (Saima, 2024). To prevent widening the gap, policymakers and institutions must close the digital divide so that everyone, regardless of socioeconomic status, can benefit from AI in education.

Finally, another major challenge about the implication of AI is digital literacy gap among students and teachers. Effective use of AI in education demands a fundamental understanding of the digital tools and data literacy, which many students from unprivileged backgrounds lack (Pangrazio & Sefton-Green, 2022). Likewise, teachers need sufficient instruction to utilize AI-driven systems efficiently (Maio et al., 2021).

Conclusion

Writing is widely considered as the most fundamental skill in language learning. Despite its importance, this skill imposes many difficulties. The latter makes the process of completing the writing tasks daunting and intimidating for many learners. AI-powered personalized learning emerged as a promising solution to overcome these challenges. By providing a variety of features including customized writing prompts, real-time feedback, and unique learning pathways, AI-powered tools assist students to build grammar, vocabulary and other crucial skills. Moreover, it encourages active engagement, promotes autonomy, boosts learners' confidence, and contributes to overall academic achievements.

Chapter Two: Exploring the Use of AI in Writing: The Field Work

Introduction

Moving to chapter two, the current study continues to unfold as it attempts to explore how EFL students and teachers at Mila University Center perceive the use of AI-powered personalized learning for the improvement of the writing skill. Whereas the first chapter aimed at reviewing the related literature as regards both the writing skill and AI-powered personalized learning, this chapter focuses on expounding the main elements pertaining to the practical part of the research, which uses questionnaire as data collections tools. As such, the chapter consists of two sections: the first is dedicated to the students' questionnaire while the second deals with the teachers. Each section presents a thorough description, analysis, and discussion of the two questionnaires.

2.1. The Research Aim

This study aims at exploring both students' and teachers' perceptions of the use of AI-powered personalized learning for the development of the writing skill. By investigating these perceptions, this study seeks to gain insight into the effectiveness of using AI in enhancing the targeted skill.

2.2. The Research Questions

To achieve the set aim, the research seeks to answer the following questions:

1. What are EFL students' perceptions of the use of AI-powered personalized learning tools for the enhancement of the writing skill?
2. What are the teachers' perceptions thereof?

3. To what extent do students use AI-powered personalized learning tools for improving their writing skill?
4. What are the different AI-powered tools students use to refine their writing skill?

2.3. Data Collection Tools

This study employs two questionnaires administered to both teachers and students at Mila University Center. By means of them, the necessary data is collected in order to achieve the research aim.

2.3.1. The Student's Questionnaire

2.3.1.1. Aim of the Questionnaire

The primary aim of the questionnaire at hand is to gain insights into how third-year LMD students at Mila University Center perceive the use of AI-powered personalized learning for developing the writing skill. Collecting data directly from the target sample is valuable as it contributes to answering the research questions and, consequently, to achieving the overall research aims.

2.3.1.2. Sample and Population

The selected population of the current study is Third-year EFL students at Mila University Center; the questionnaire was administered to a sample of 70 students out of 149. The reasons for selecting this population in particular is that third year students, compared to first and second years, are generally expected to have more experience concerning learning the English language and developing the writing skill specifically. Moreover, as they have been developing the writing skill for two years at university, it is likely that third year students have been exposed to various AI-driven writing tools all over the past two years.

Most importantly, third year students are assessed primarily through essay writing, which makes writing a skill of paramount importance to them.

2.3.1.3. Administration of the Students' Questionnaire

As mentioned before, the students' questionnaire was distributed to 70 third-year students at Mila University Center. The administration of the questionnaire was in-person, conducted over four days.

2.3.1.4. Description of the Students' Questionnaire

The students' questionnaire is composed of twenty-two questions and divided into four main sections. The first section, "Background information", consists of three close-ended questions. As the label indicates, this section attempts to collect data related to the students' backgrounds. This includes information about their gender, English level, and whether the decision to study English at university was made voluntary or imposed.

The second section is devoted to the writing skill. It contains eight questions. This section seeks to gain insights into the students' perceptions of the writing skill, including their level, the importance of this skill to them, and the difficulties and challenges the development of this skill might impose.

Additionally, the third section includes eight questions. The section includes close-ended question as well as semi-close-ended questions. It is dedicated to gather data pertinent to AI-powered personalized learning. This includes exploring how third-year students view AI-powered personalized learning and how they improve the writing skill with the assistance of AI-powered personalized learning tools.

Finally, the fourth section which is composed of one close-ended question and two open-ended ones aims at obtaining recommendations and feedback from students with regard

to their experience of using AI-powered personalized learning tools for the development of the writing skill.

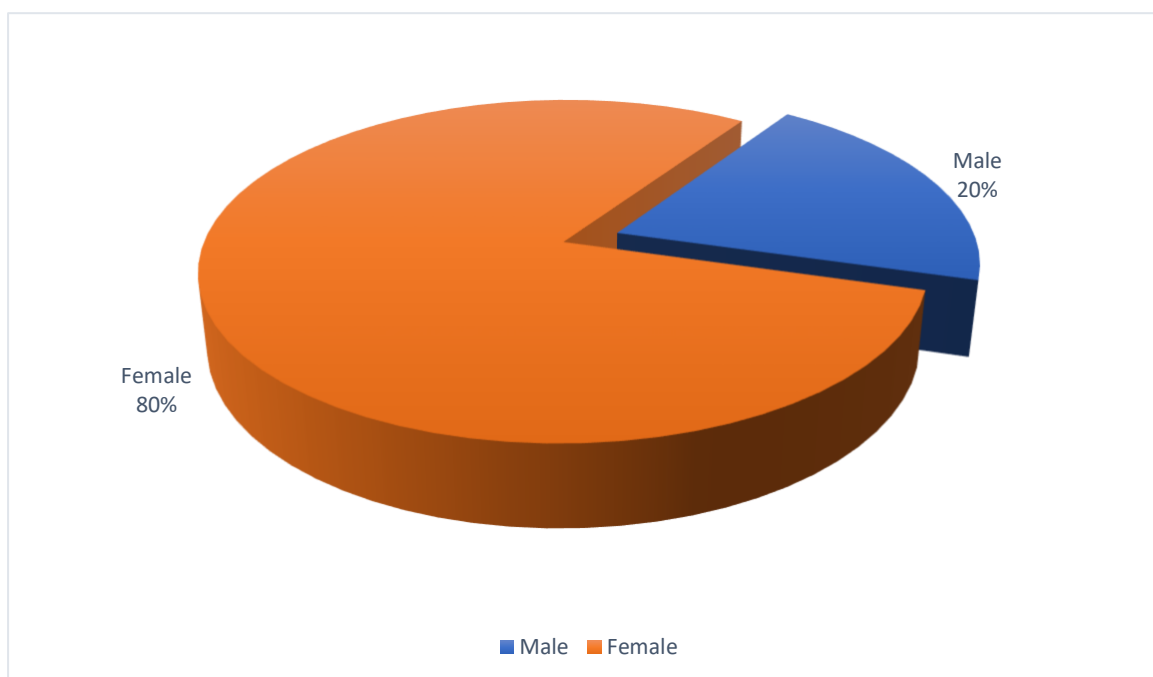
2.3.1.5. Analysis of the Results

2.3.1.5.1. Background information

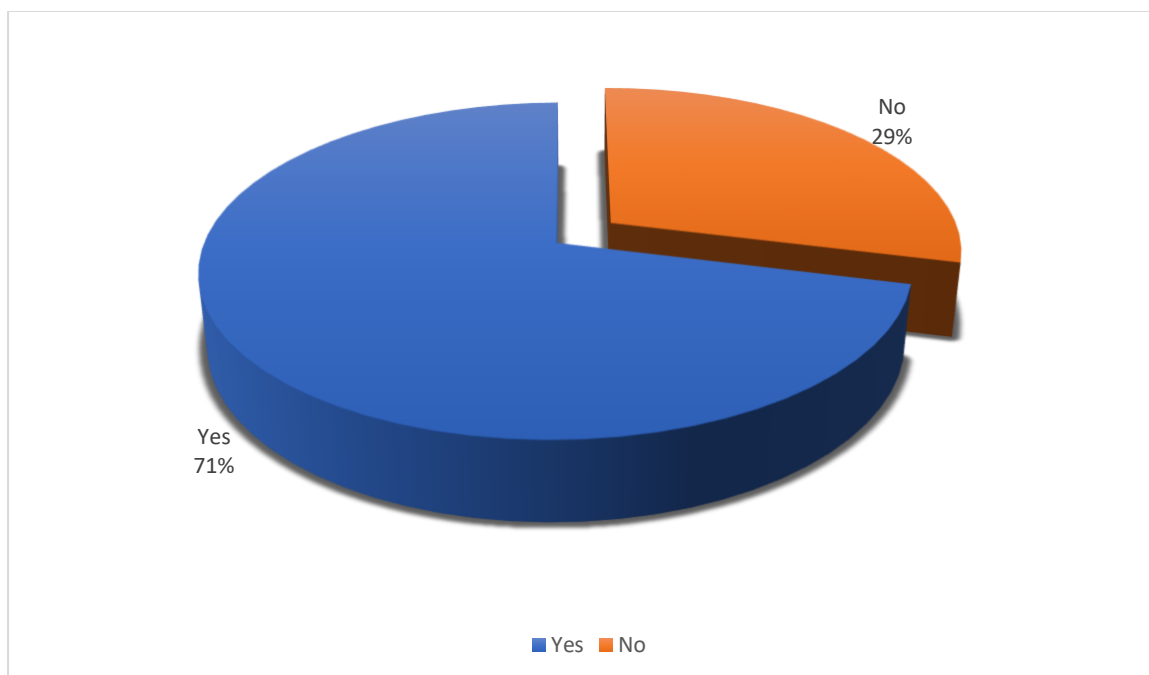
This section aims to collect demographic information from the participants. While such data does not directly contribute to the primary objectives of the current study, it provides contextual background that may be interesting to curious readers.

Q1: What is your gender?

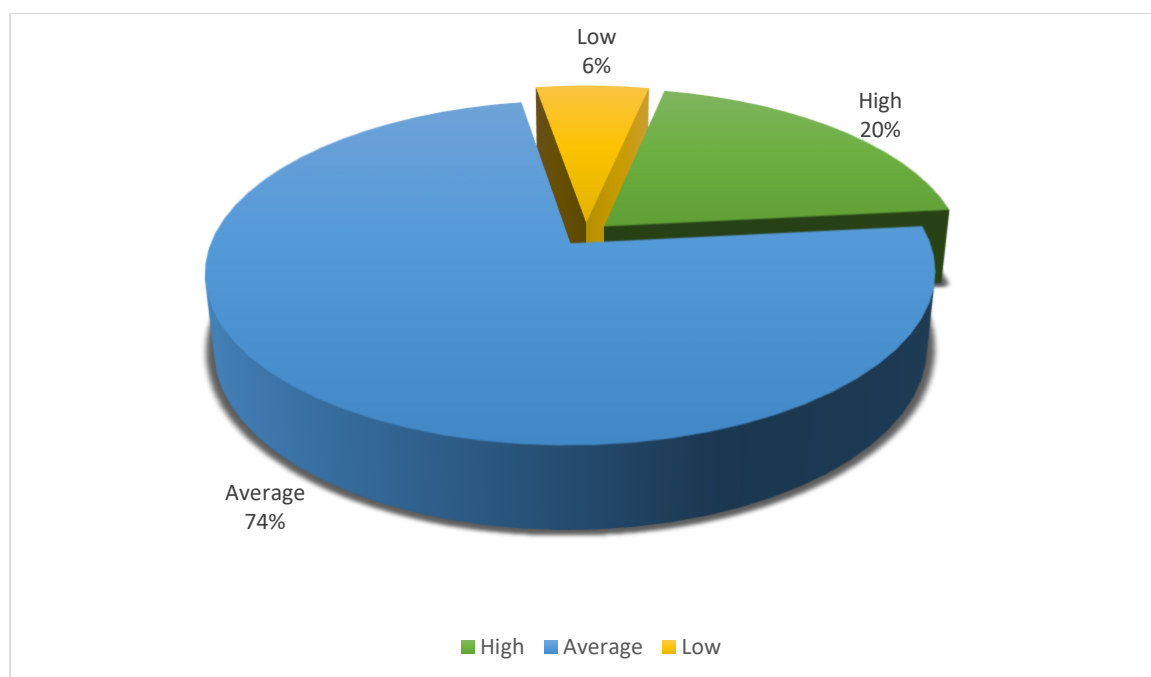
Figure 2.1. The students' gender



This question is intended to identify the gender of the respondents. As shown in the pie chart, 80% of the respondents are females while the 20% remaining percentage represents male students.

Q2: Was it your choice to study English at university?***Figure 2.2. Students' choice***

As Figure 2.2 displays, 71% of the students voluntarily chose to study English at university. On the other hand, the remaining 29% did not choose to study it. Interestingly, many students opted for studying English as a primary choice. This can be attributed, among others, to the growing global demand for English proficiency; many students have become aware that English is considered a key asset for communication, pursuing higher education, and securing better job opportunities. It might be conjectured that voluntary choice is likely to relate to students' learning practices.

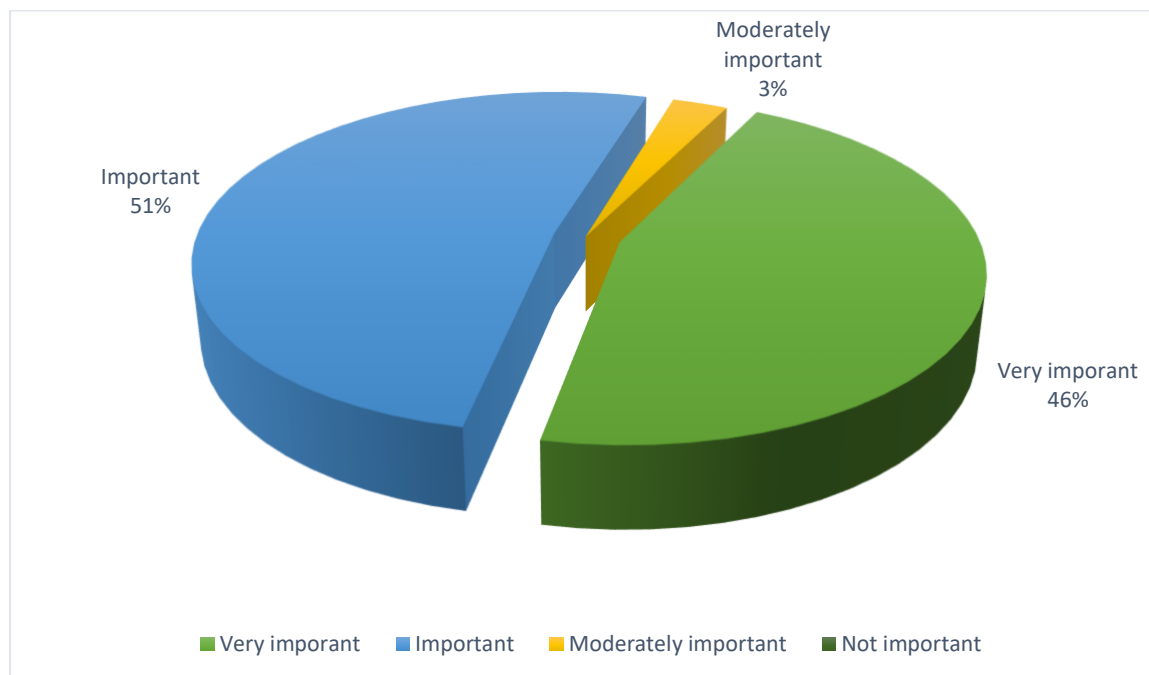
Q3: How do you rate your level in English?***Figure 2.3. Students' English level***

The objective of this question is to collect data about the students' perceived English level. The results presented in Figure 2.3 reveal that 74% of the respondents have an average level. Twenty percent consider their level as high while the remaining 6% rate themselves low in level. This distribution can be justified by the lack of exposure to the language, even in formal educational settings, which is often constrained by time and curriculum requirements. Thus, formal education may have helped students achieve a functional level of competence, but this is not necessarily advanced. Additionally, students might be conservative in regard of the evaluation of their level, especially in an academic context where high standards influence their self-assessment. This means that that students may underestimate their true abilities when evaluating their own skills, especially in academic settings where high expectations and rigorous standards can affect the way they perceive themselves.

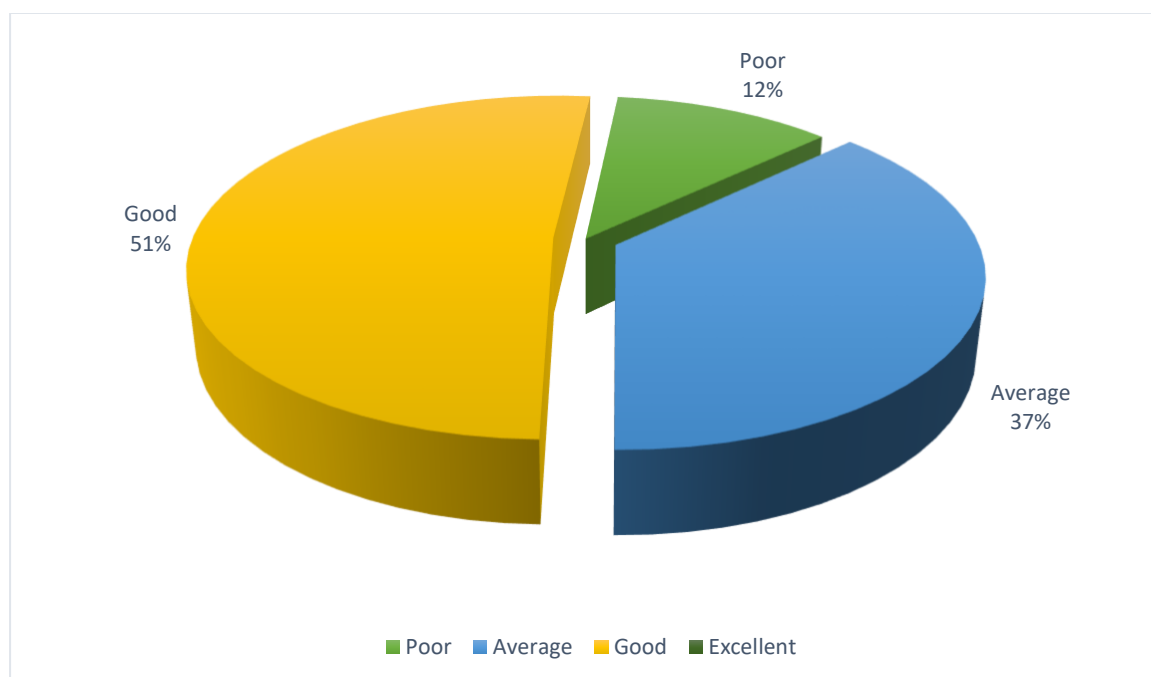
2.3.1.5.2. The Writing Skill

Q4: Is the writing skill important to you?

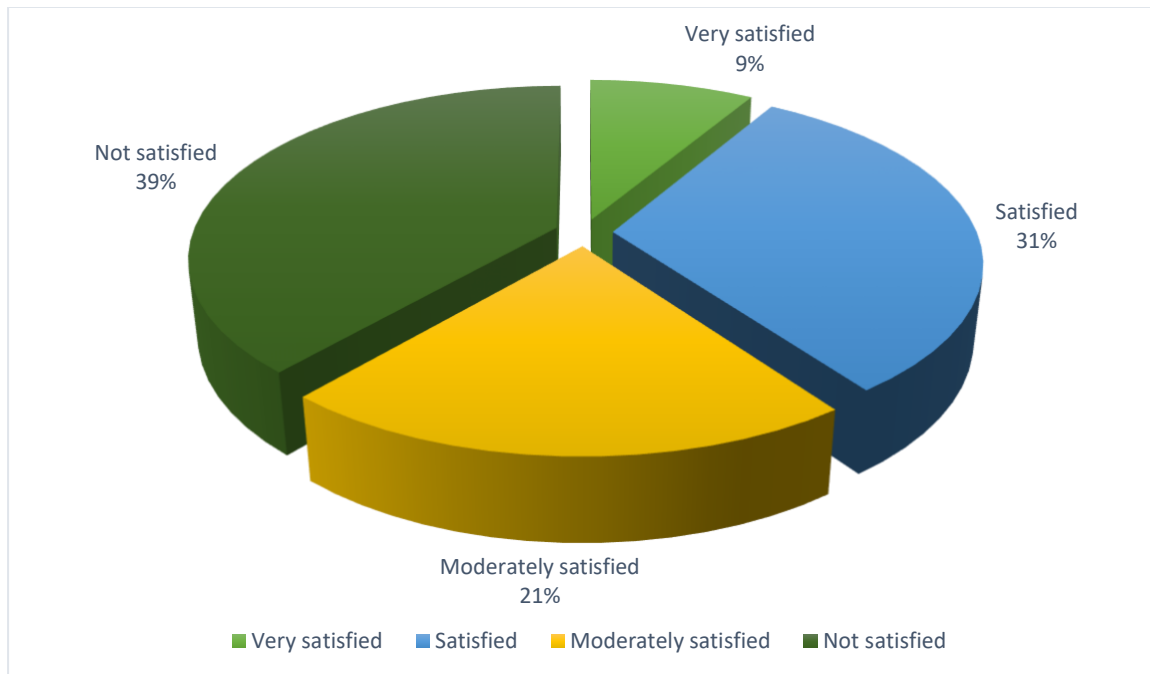
Figure 2.4. Students' perceptions of the importance of the writing skill



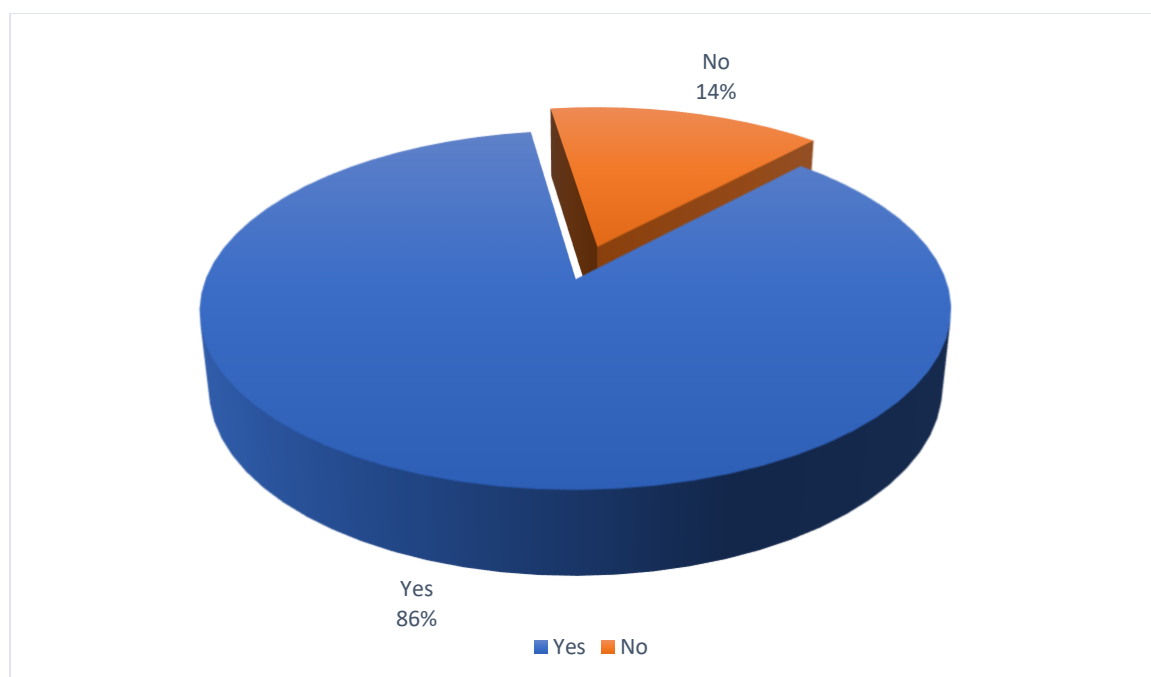
This question is meant to know the students' perceptions about the importance of learning the writing skill. The results shown in Figure 2.4 indicate that 51% of the participants consider writing as an important skill, while 46% said it is a very important skill. The rest, 3%, indicated that the writing skill is moderately important for them. These results provide insights into the student's awareness of the importance of mastering the writing skill in order to be proficient in the target language.

Q5: How do you describe your writing ability?***Figure 2.5. Students' writing abilities***

According to the data demonstrated in the Figure 2.5, 51% of the sample reported having a good level of writing, which indicates that a significant number of the sample are confident in their ability to write. Additionally, 37% of them stated that their ability to write in English is average, and the remaining 12% reported a poor writing ability. These results emphasize the difference between the writing abilities of EFL third year students; identifying the very nature of those difficulties may help students what AI tool to use and how, and recognizing those individual differences teachers may help to develop the learners' writing skill.

Q6: Are you satisfied with your writing level?***Figure 2.6. Students' satisfaction with their writing level***

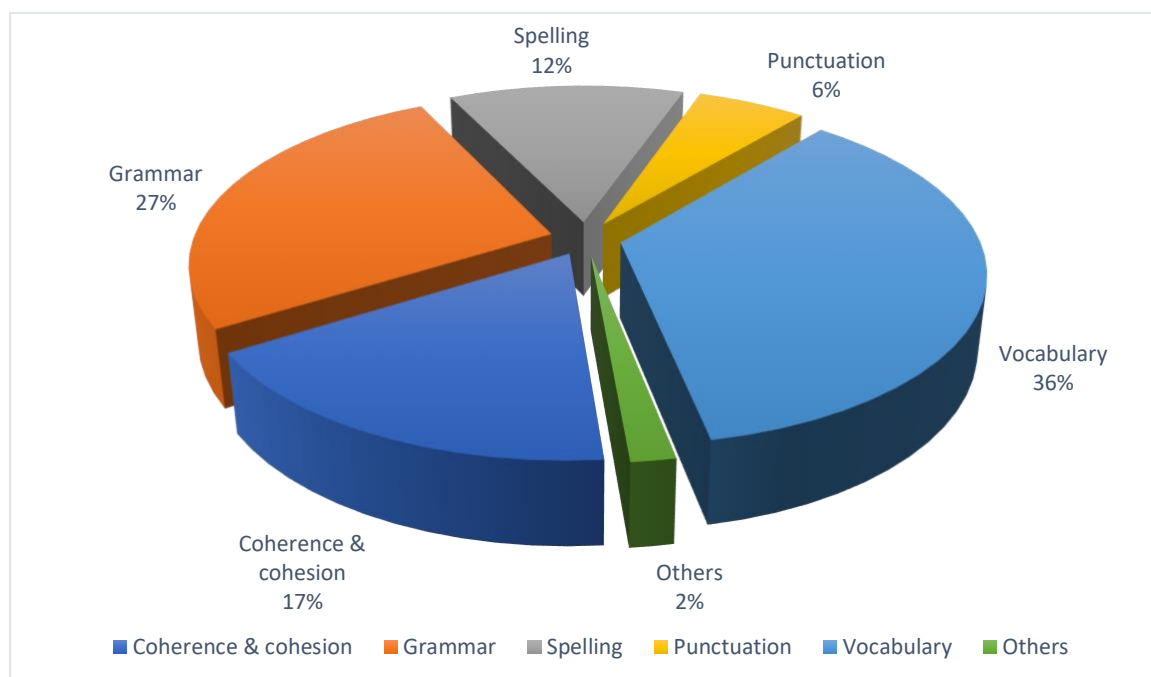
Based on the obtained results, it is evident that an important proportion of the respondents, accounting for 39% of the sample, are not satisfied with their writing level. However, 31% of them expressed satisfaction. Additionally, 21% of the participants stated that they are moderately satisfied with their writing level, and the remaining 9% stated that they are satisfied therewith. The significant percentage of students expressing dissatisfaction suggests that the majority of students need to work more on developing their writing skill.

Q7: Do you face any challenges while writing?***Figure 2.7. Challenges faced by students when writing***

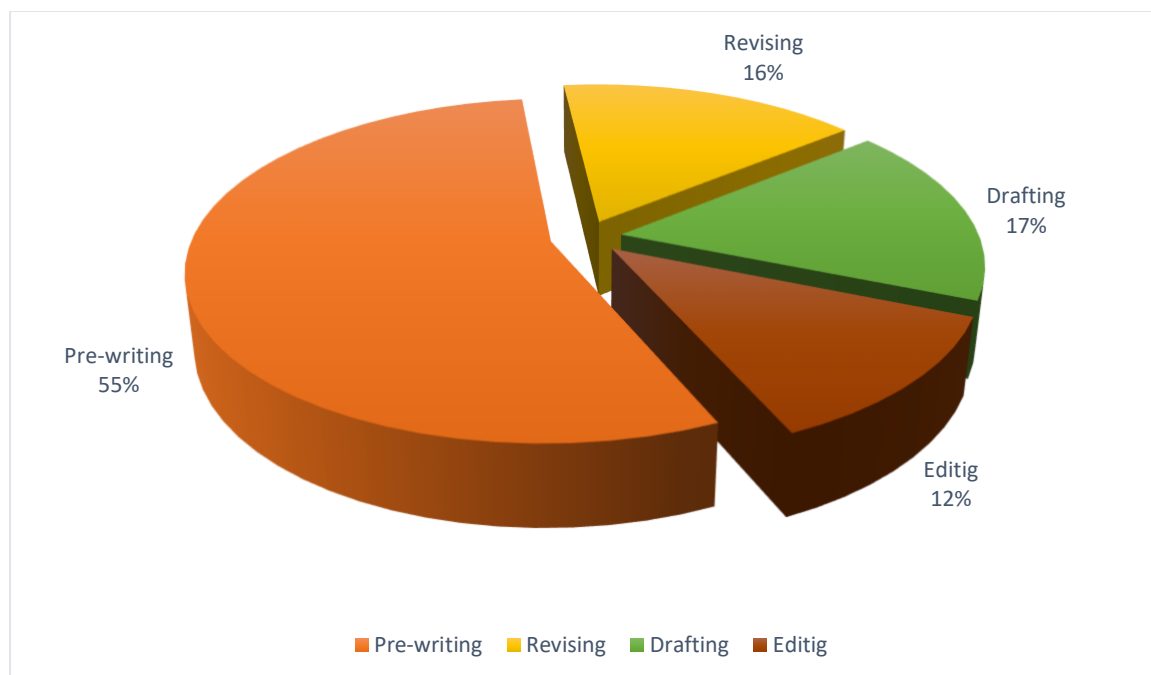
This question aims to find out whether third year students of English perceive writing as a challenging task. Figure 2.7 demonstrates that the majority of the respondents (86%) face challenges. However, 14% of them find writing to be an easy task. The outcomes suggest that even students who consider their writing ability “good” (51%) do encounter difficulties, possibly due to the complexity of academic writing or insufficient practice.

Q8: If yes, what aspects of writing are most challenging for you?

Figure 2.8. Students' writing difficulties



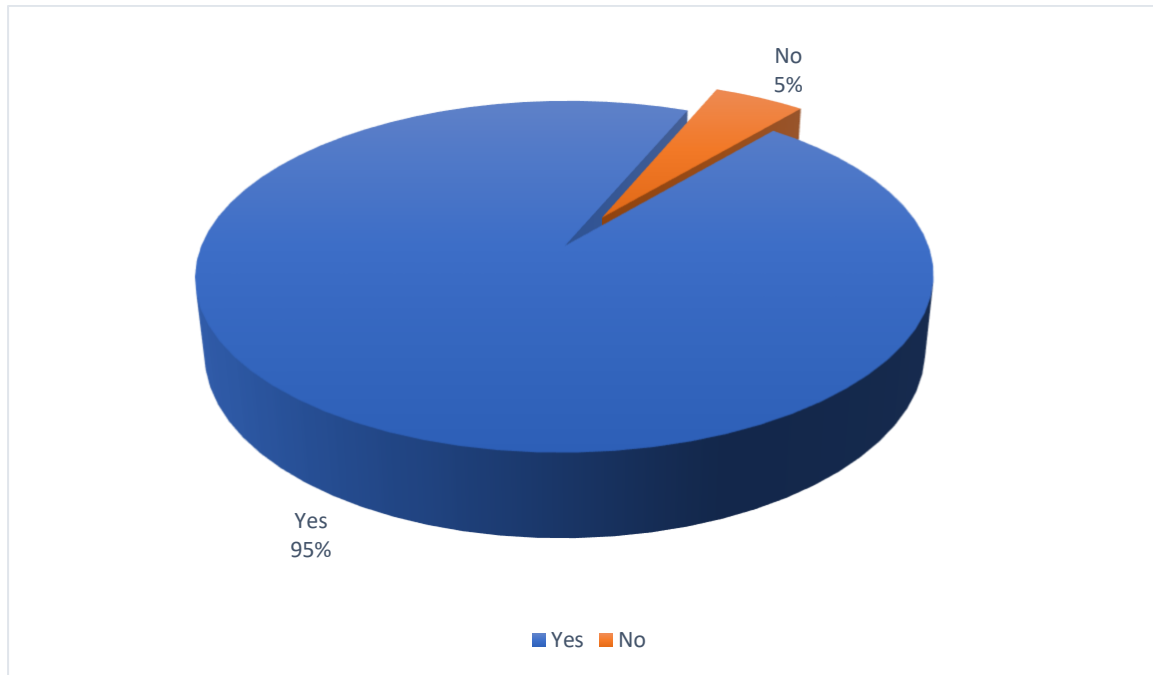
The purpose of this question is to uncover the challenges that third year students of English encounter in their writing activities. As displayed in Figure 2.8, vocabulary emerges as the most significant challenge, with 36% of students identifying it as their primary difficulty. Grammar follows at 27% while coherence and cohesion prove a challenge for 17% of the respondents. Spelling difficulties were reported by 12% and punctuation problems were reported by 6% of the students. The rest, 2%, cited other issues mainly related to not having enough knowledge about the topic they write about. These results reveal that lexical and structural elements of language (vocabulary and grammar) pose greater obstacles than organizational aspects for most students.

Q9: What are the most difficult stages in writing for you?***Figure 2.9. Students' toughest writing stages***

The data demonstrate that 55% of the respondents have difficulty with the first stage of the writing process, which is pre-writing, then the drafting stage with a percentage of 17%. Revising comes next with 16%, and lastly editing with 12%. These results suggest that students struggle mostly with brainstorming, organizing ideas, and planning their written work before beginning to draft and write, notwithstanding the other challenges.

Q10: Is the way of teaching the writing skill at university satisfying for you?

Figure 2.10. Student's satisfaction with the way of teaching the writing skill



Based on the results obtained from Figure 2.10, it is evident that the overwhelming majority of the respondents, accounting for 95% of the entire sample, expressed satisfaction with the way they are taught the writing skill. Conversely, 5% responded in the negative, indicating an absence of satisfaction. These findings highlight that the current instructional method is effective for the majority of the students.

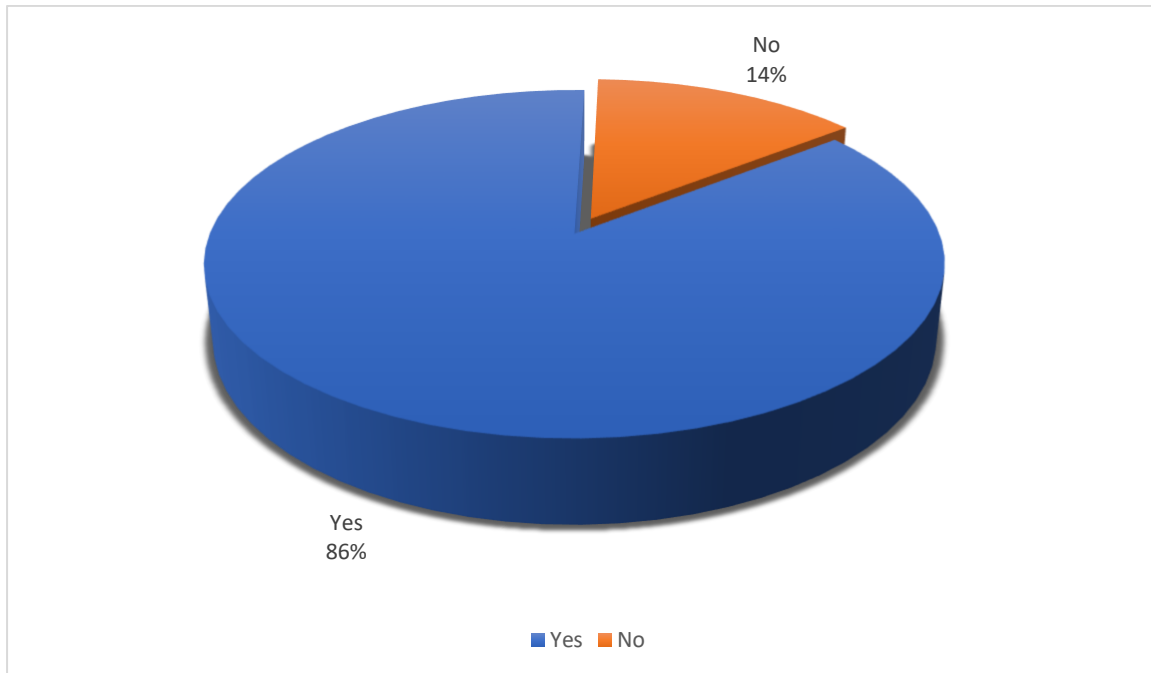
Q11: If no, why not?

The 5% of the students who claimed to be dissatisfied with the way they are taught writing at university explained their dissatisfaction with the lack of personalized feedback, and the lack of motivation towards writing-related tasks.

2.3.1.5.3. AI-Powered Personalized Learning and Writing

Q12: Have you used any AI-powered tools to personalize your learning?

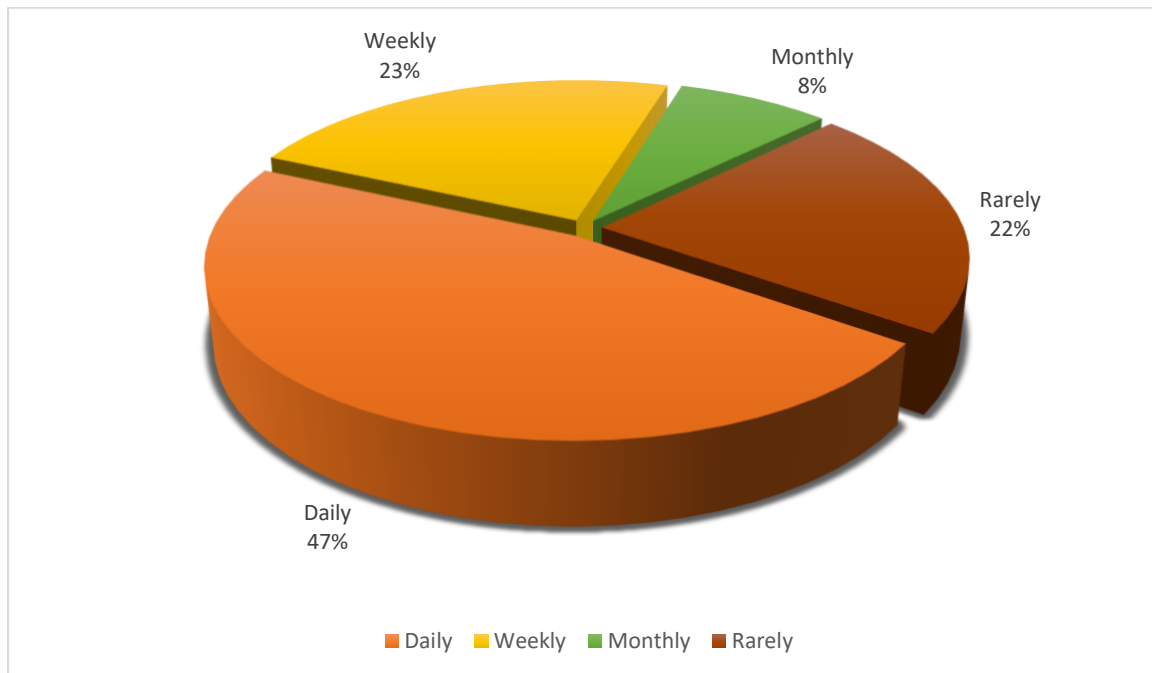
Figure 2.11. Student's experience with AI personalized learning tools



According to Figure 2.11, a large proportion of the respondents (86%) reported using AI-powered tools to personalize their learning. The remaining portion of 14% represents students who have not used such tools. This distribution indicates that students are aware of, and actively integrating, AI technology into their learning process. Additionally, such high usage can be justified by the increasing availability of AI-driven platforms.

Q13: If yes, how often do you use AI-powered tools to personalize your learning?

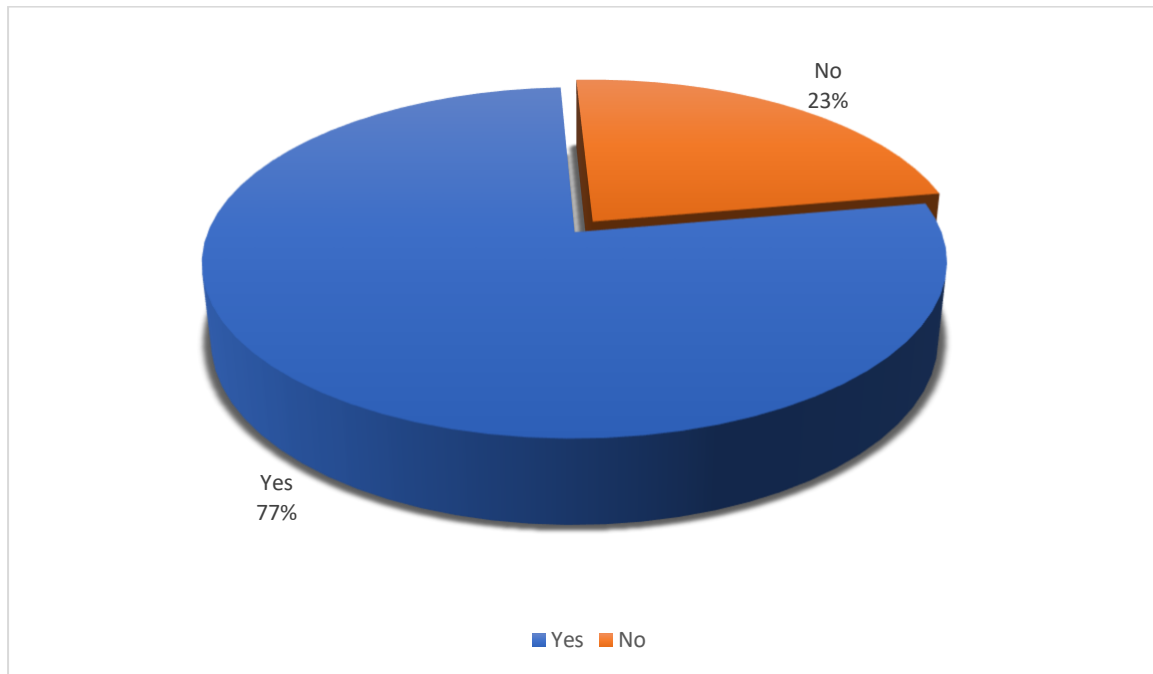
Figure 2.12. Student's frequency of AI tools use



Students who stated that they have used AI-powered tools for the personalization of their learning were further asked to indicate how frequently they used these tools. The results show that 47% of the respondents mentioned that they use them daily; twenty-three percent reported using them weekly; eight percent use the tools monthly; the remaining 22% of the participants indicated using them rarely. The results suggest that most of the participants rely on AI-powered tools as a regular element of their learning process.

Q14: Have you used any AI-powered personalized learning tools to improve your writing?

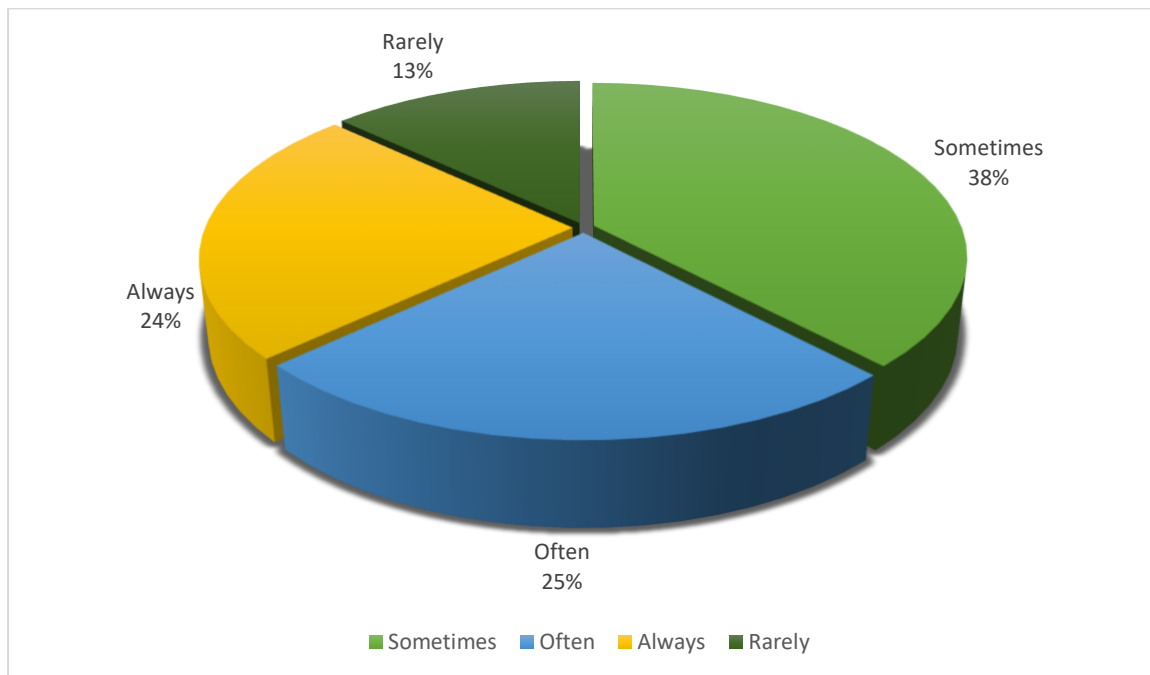
Figure 2.13. Student's use of AI tools for personalizing writing



This question seeks to investigate the students' use of AI-powered personalized learning tools for improving their writing. The majority of the respondents (77%) reported that they have used these tools for writing improvement while 23% indicated not having integrated the said tools. Overall, the results suggest that students do use AI-powered tools for personalizing their writing. This also may reflect that AI learning tools have become a helpful source for writing tasks.

Q15: If yes, how often do you use AI-powered personalized learning tools for writing tasks?

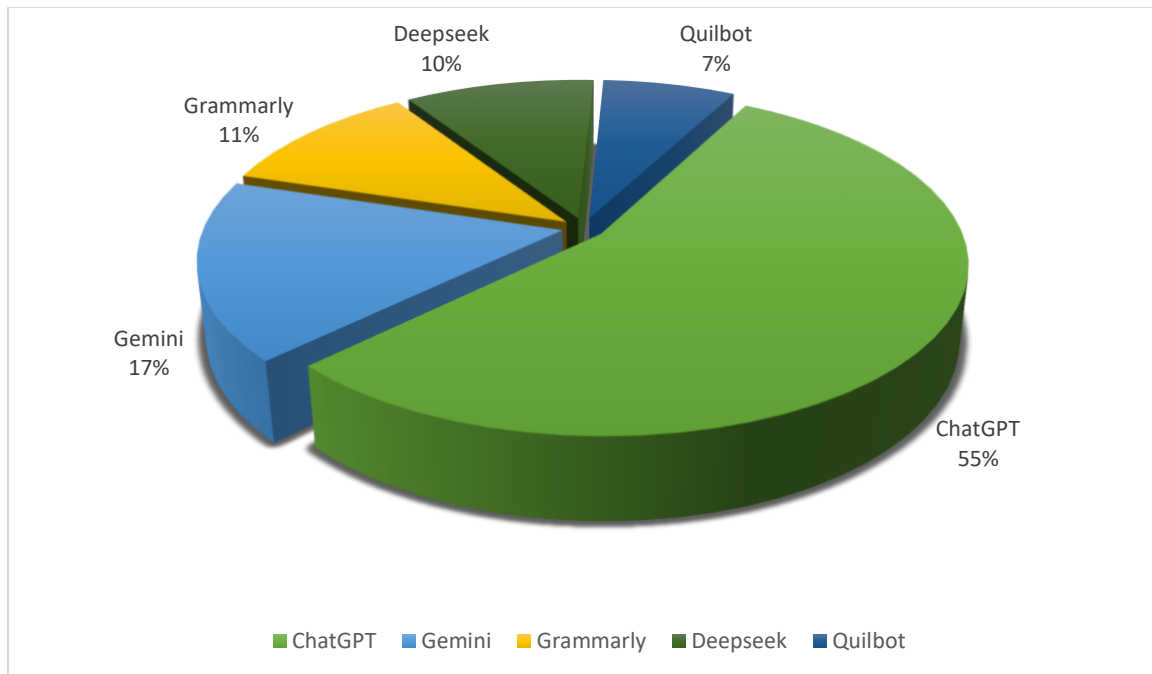
Figure 2.14. Students' frequency of using AI tools in writing



Building on the previous question, this item explores the frequency with which students integrate such learning technologies in the writing tasks. Thirty-eight of the participants responded that they sometimes use such tools for writing tasks. Furthermore, 25% reported that they often make use of such tools. Additionally, 24% stated that they always rely on them, while the remaining 13% use them rarely. These responses may reflect the students' awareness of how AI-powered tools can assist them in the process of personalizing their writing.

Q16: Which specific AI-powered tool(s) have you used to improve your writing skill?

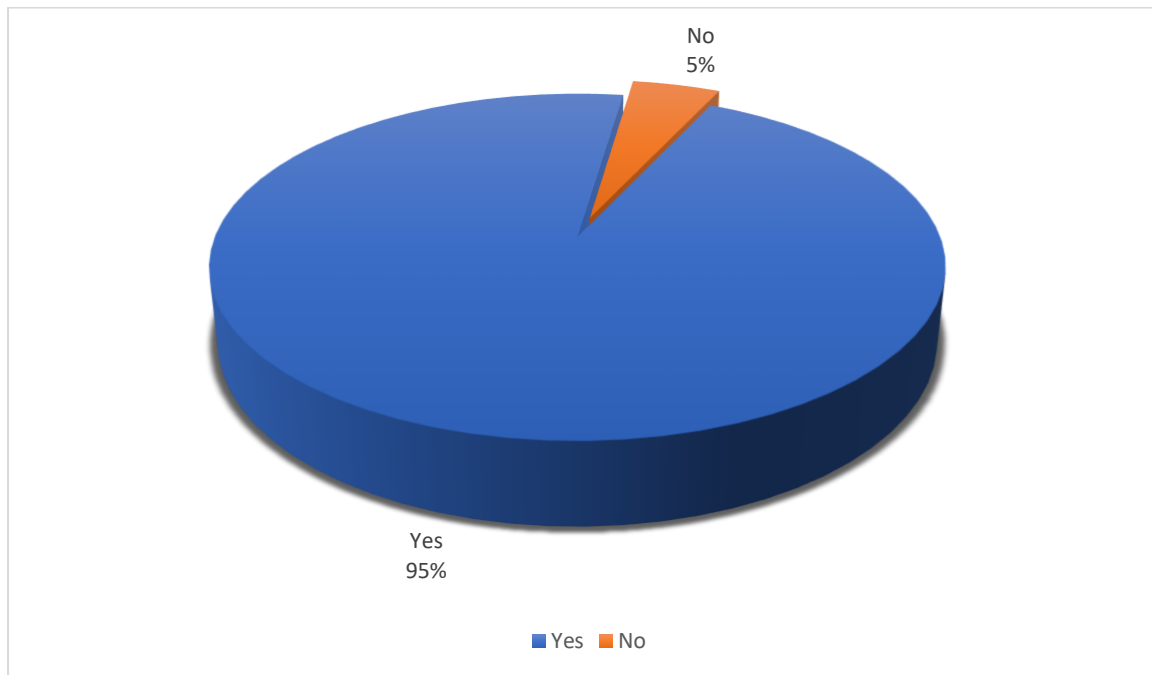
Figure 2.15. Student's preferred AI tools for writing



Providing a list of AI-driven platforms, this item aims at identifying the most commonly used applications by students for personalizing the writing skill. Interestingly, ChatGPT was the most selected one, with 55% of the participants indicating that they have used it. In comparison, Gemini was selected by 17%, followed by Grammarly (11%), Deepseek (10%), and Quilbot (7%). Some students suggested three other tools in addition to the ones provided, including Meta AI, Perplexity, and Sider AI. Primarily, the results point out to a variation in the use of AI-powered tools for writing among students. In addition, the results reveal that, though they are not specific platforms for writing, ChatGPT and Gemini are the most used ones by students in comparison to Grammarly, Quilbot, and Deepseek. This is perhaps due to the students' familiarity with these tools especially that they are the most well-known ones and that they are used for different purposes.

Q17: Do you find AI-powered personalized learning tools helpful in improving your writing?

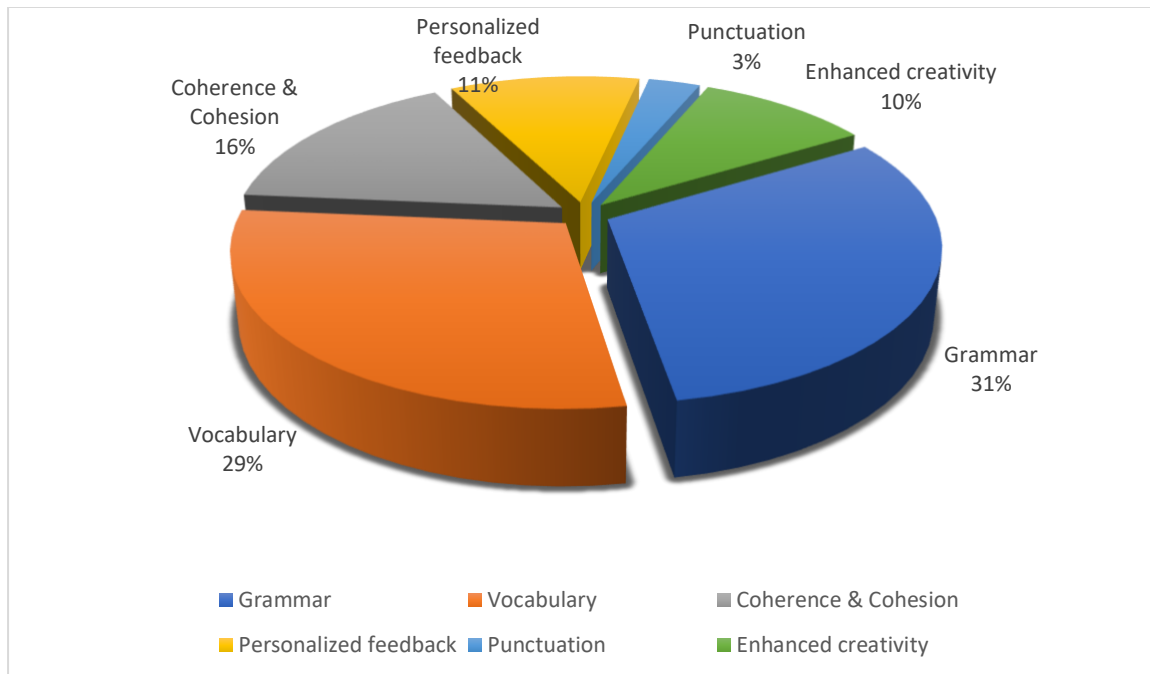
Figure 2.16. Student's perception of AI helpfulness



This question attempts to understand the way students perceive the usefulness of AI-powered personalized learning tools for writing improvement. The responses show that 66%, which is equivalent to 46 participants out of a total of 70, perceive the use of AI tools as helpful for enhancing the writing skill. In contrast, 34% of the respondents expressed a negative perception, suggesting that they do not find such tools beneficial. The results denote that there is an increasing integration of AI-powered tools in the writing tasks. This may be attributed to the ability of such tools to provide real-time feedback, suggest alternative phrasing, correct grammar and syntax errors, and help with ideas organization. On the other hand, those who find the use of such tools unhelpful may reflect lack of interest in, or familiarity with, such technologies, or just a learning preference.

Q18: Which aspects of writing have these tools helped you with the most?

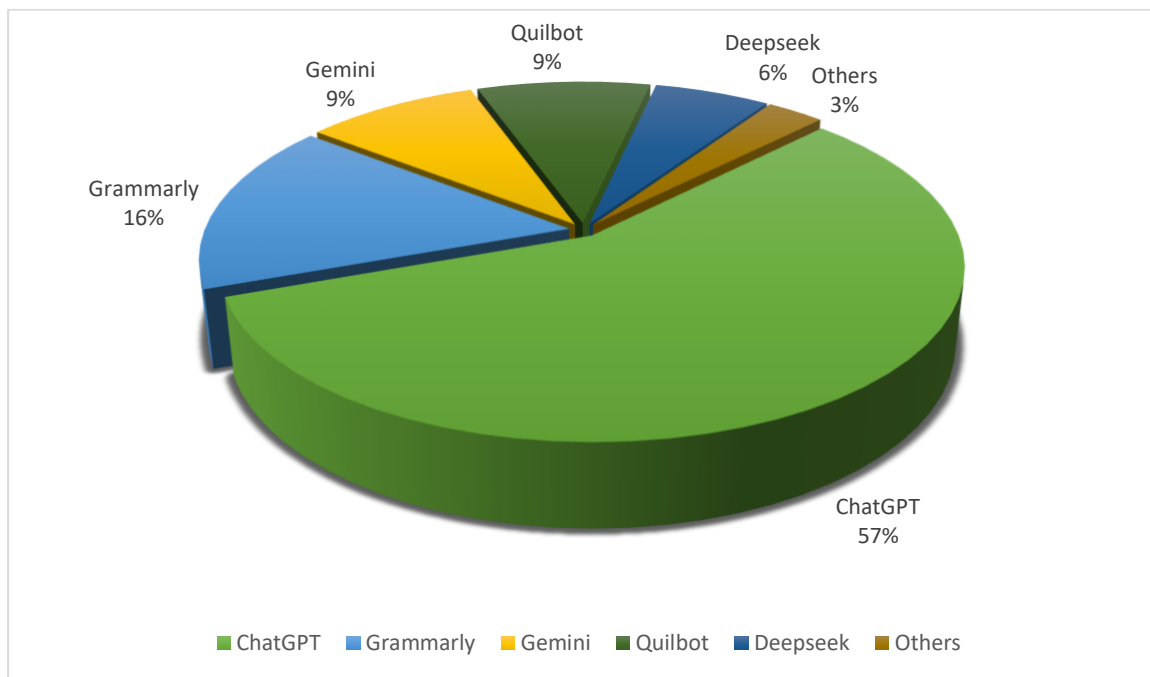
Figure 2.17. Student's writing aspects improved by AI



Following the investigation of students' perceptions with regard to the usefulness of AI-powered personalized learning tools, this question seeks to explore the specific aspects of writing in which these tools have been beneficial. Given the results, AI tools help students mostly with grammar and vocabulary which were selected by 31% and 29%, respectively. Next, 16% of the participants reported that the tools are advantageous for establishing coherence and cohesion. Additionally, 11% believe that these tools are of use as they provide personalized feedback. Ten percent recognized the effectiveness of AI-driven tools for enhancing creativity while only 3% perceived their usefulness for punctuation. This distribution demonstrates that students may struggle the most with grammar and vocabulary when completing their writing tasks, so they rely the most on AI tools to assist them in overcoming such difficulties.

Q19: What AI-powered personalized learning tools do you think are the most beneficial for improving the writing skill?

Figure 2.18. Student's perceptions on the most beneficial AI tools for writing

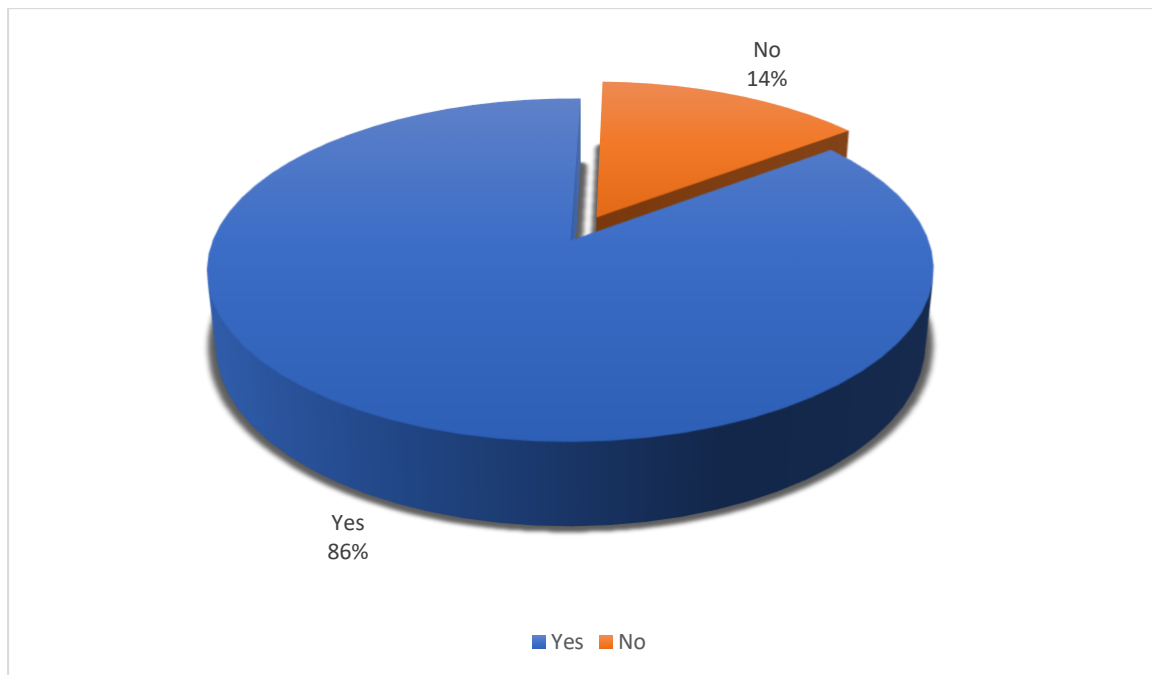


This question attempts to identify which AI-powered personalized learning tools students think are the most effective for improving the writing skill. According to Figure 18, most of the participants (57%) deemed ChatGPT to be the most useful tool. Following this, Grammarly was selected by 16% of the respondents, while Gemini and Quilbot each received 9% of the responses. Lastly, Deepseek is considered as the least useful one as it was selected by 6% of the respondents. In addition to the tools provided, 3% of the participants suggested the usefulness of My AI and Sider AI. A large number of respondents view ChatGPT as the most beneficial tool for writing improvement. This result is likely due to the interactive nature and popularity of this platform.

2.3.1.5.4. Recommendations and Feedback

Q20: Based on your experience, do you recommend the use of AI-powered personalized learning tools for the improvement of the writing skill?

Figure 2.19. Students' willingness to recommend AI tools



The vast majority of the participants (86%) are willing to recommend using AI-powered tools to improve their writing, while a smaller percentage (14%) are not. This positive response suggests that most students find value in these tools, likely appreciating features like instant feedback, personalized exercises, and the ability to practice independently. Those who said "no" might be wary about the efficacy of AI technologies or favor more conventional teaching techniques.

Q21: Suggest the most beneficial way for using these tools to improve the writing skill.

This question seeks to identify students' suggestions for the most effective ways to use AI-powered personalized learning tools for enhancing the writing skill. A total of 33

students provided a variety of suggestions, which can be summarized into the following themes. Firstly, 24% of the respondents recommended using AI-powered tools to receive feedback on written work. This means completing the writing task and then submitting it to the tool which is prompted to provide correction for grammatical, lexical, and structural errors. Secondly, 17% of the students believe that the best way to take advantage of these tools is to rely on them for getting the essential elements for writing. This may include asking AI to provide vocabulary and information. For example, students stated that the tools are helpful for brainstorming or reading about the topic before starting the writing process. Lastly, 6% proposed using the platforms to generate model texts. These models can be used as examples that help students' structure, tone, and content which they can then imitate in writing their own work.

Q22: Please, feel free to share any additional thoughts or comments about your experience with AI-powered personalized learning tools.

The last question is an open-ended question, given to students to provide further suggestions concerning their experiences with AI-powered tools. This question was answered by 39% of the participants and the main suggestions are:

- Nine percent of the participants reported that AI tools are useful but should be used moderately to avoid harming creativity and causing over-reliance.
- Another 9% suggested that AI tools enhance personalized learning and writing by delivering tailored feedback and guidance, in addition to improving efficiency and engagement while maintaining originality.
- Seven percent of the participants stated that AI tools enhance learning by making it faster, easier, and more enjoyable.

- ▶ Six percent of the participants explained that AI tools are highly beneficial for learning, particularly in improving writing skills, expanding vocabulary, and overall academic growth.
- ▶ Five percent of the participants said that AI tools are useful because they provide extra information and help with learning, writing, and exam preparation.
- ▶ Three percent of the participants suggested that practice and personal effort are key to improving skills. AI tools can help by giving ideas or starting points, but the best work comes from reworking those ideas.

2.3.1.6. Discussion of the Results

The purpose behind the students' questionnaire is to explore the participants' perceptions of the use of AI-powered personalized learning tools in enhancing the writing skill. The analysis of the data reveals different findings. The most important findings from this survey are highlighted in the discussion yet to unfold.

The results reveal that third-year students perceive writing as an important skill. Based on the findings, it is evident that the students have a good level concerning the writing skill; however, a relatively large amount of them are not really satisfied with this level. Additionally, most of the participants face challenges while writing. These difficulties are faced mainly in both the aspects and the process of writing; when it comes to the aspects, coherence and cohesion as well as grammar are considered the most difficult ones, while pre-writing is the toughest step in the process of writing.

The data also shows that most of the learners are familiar with using AI-powered tools. Most of them use these tools on a daily basis to personalize their learning. This also applies when it comes to the writing skill as many reported that they sometimes use these tools for writing improvement. Clearly, students use a wide range of AI-powered tools, yet

the most preferred one appears to be ChatGPT. Furthermore, from the data, it is clear that the majority of students do perceive the use of AI tools as being helpful for writing tasks, as they assist them mainly in grammar and vocabulary.

To push further, the use of AI is recommended by the majority of third-year students as they find it advantageous for improving the writing skill. The participants have suggested a variety of ways for the best use of these tools for writing enhancements. Among these, they recommended using AI as a guide and feedback provider throughout the writing process and not the doer of the writing task.

2.3.2. The Teachers' Questionnaire

2.3.2.1. Aim of the Questionnaire

The primary aim of the questionnaire at hand is to gain insights into how EFL teachers perceive the use of AI-powered personalized learning for developing the writing skill. Collecting data directly from the target sample is valuable as it contributes to answering the research questions and, consequently, to achieving the overall research aims.

2.3.2.2. Sample and Population

The questionnaire was conducted with EFL teachers at Mila University Center. A sample of 15 teachers was selected for the study to contribute their opinion of the role of AI.

2.3.2.3. Administration of the Teachers' Questionnaire

As mentioned before, the teachers' questionnaire were distributed to 15 EFL teachers at Mila University Center. The administration of the questionnaire was in person and conducted over seven days.

2.3.2.4. Description of the Teachers' Questionnaire

The teachers' questionnaire is composed of twenty questions and divided into four main sections. The first section, "Background information", consists of two close-ended questions. It attempts to collect data related to the teachers' backgrounds. This includes information about their academic degree, and how long they have been teaching English as a foreign language.

The second section is devoted to the writing skill. It contains five questions. This section seeks to gain insights into the teachers' perceptions of their students' level in the writing skill, the importance of this skill, and the difficulties they observed in their learners' writing.

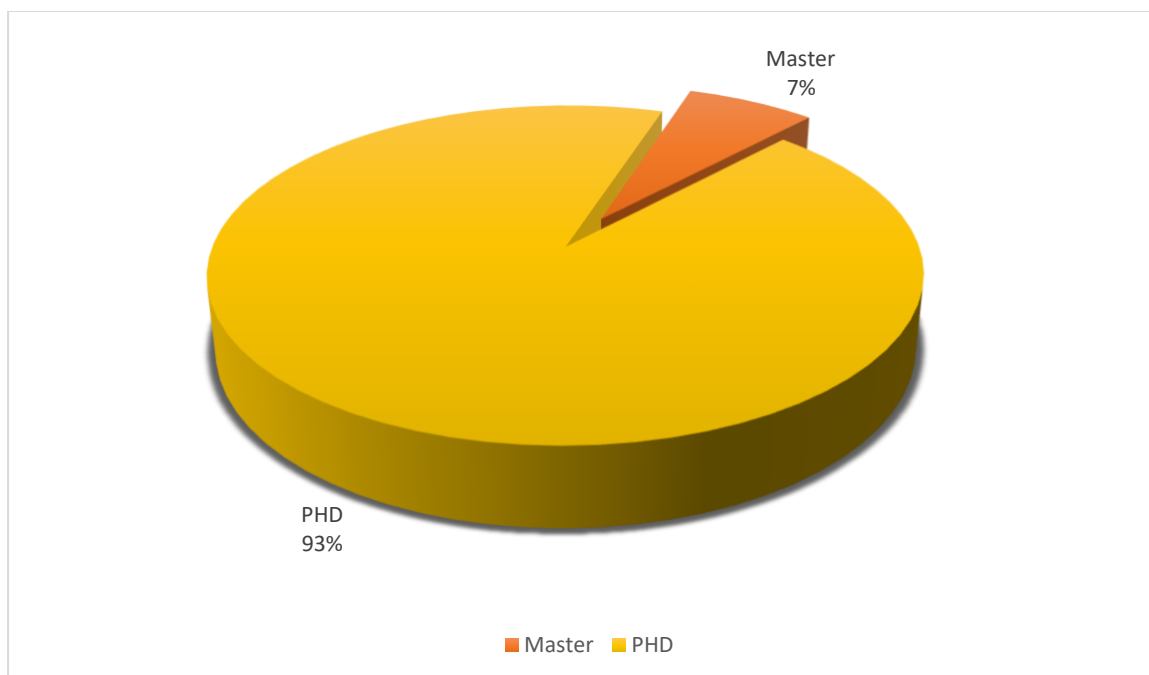
Additionally, the third section includes four questions. It consists of close-ended as well as open-ended questions. It is dedicated to exploring how EFL teachers at Mila University Centre view AI-powered personalized learning and how they improve the writing skill of their students with the assistance of AI-powered personalized learning tools.

Finally, the fourth section is composed of two close-ended question and seven open-ended ones. It aims at obtaining recommendations and feedback from teachers regarding their experience with using AI-powered tools for the development of the learners' writing skill.

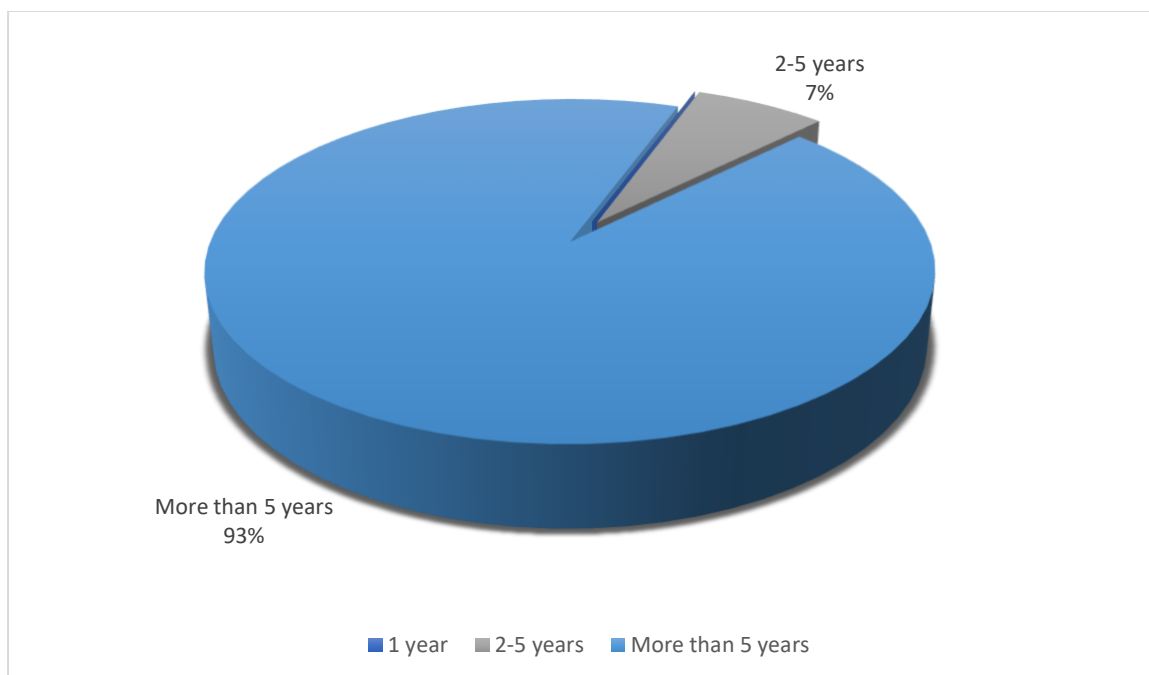
2.3.2.5. Analysis of the Results

2.3.2.5.1. Background information

This section aims to collect demographic information from the participants. While such data does not directly contribute to the primary objective of the current study, it provides contextual background that may be interesting to a good number of readers.

Q01: What is your academic degree?***Figure 2.20. Teachers' Academic Degree***

We can notice from the Figure 2.20 above that the majority of the respondents have a Doctorate degree (PhD) with a percentage of 93%. The remaining 7% have a Master degree. This promises valuable information and answers to the questionnaire.

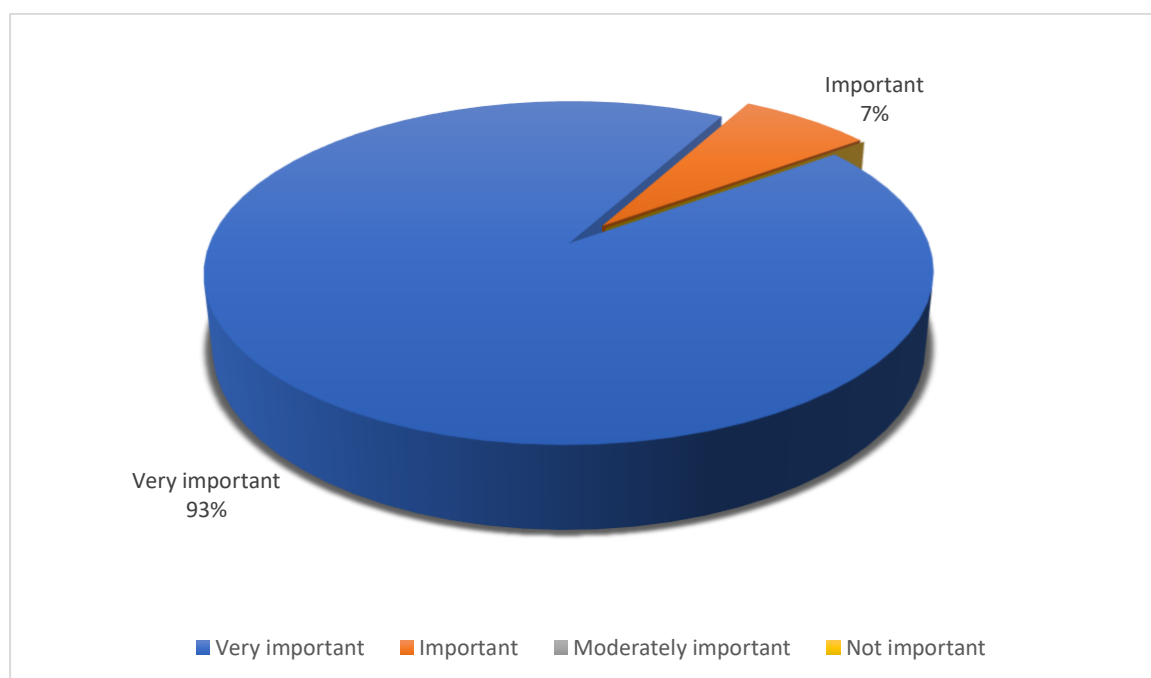
Q02: How long have you been teaching English?***Figure 2.21. Teaching Experience***

Based on the data demonstrated in Figure 2.22, 93% of the participants have been teaching English for more than five years. The remaining 7% said that they have been teaching for less than five years (2-5 years). Overall, this shows that the group of participants included many EFL teachers with different levels of experience, from two years to over five years.

2.3.2.5.2. The Writing Skill

Q03: To what extent do you think the writing skill is important for achieving academic success in EFL classes?

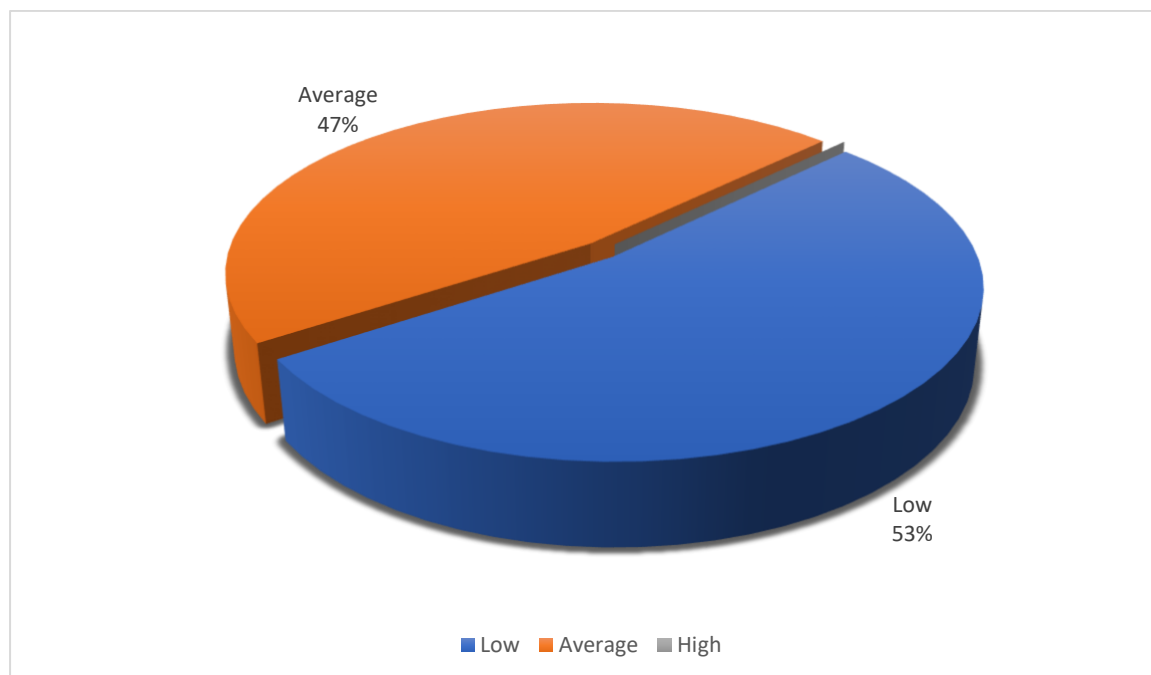
Figure 2.22. Importance of the Writing Skill



The aim behind this question is to probe teachers' perceptions regarding the importance of the writing skill for the achievement of academic success. Given the data presented, it is clear that the overwhelming majority of teachers, translating into 93% of the total, consider the writing skill to be highly important for accomplishing academic success. The remaining 7% also acknowledged its importance, though not to the same extent. The results demonstrate that 100 % of the teachers view the writing skill as a crucial component for academic success in EFL classes. This strong agreement highlights critical role writing plays in academic achievement.

Q04: How would you rate your students' current level of writing ability?

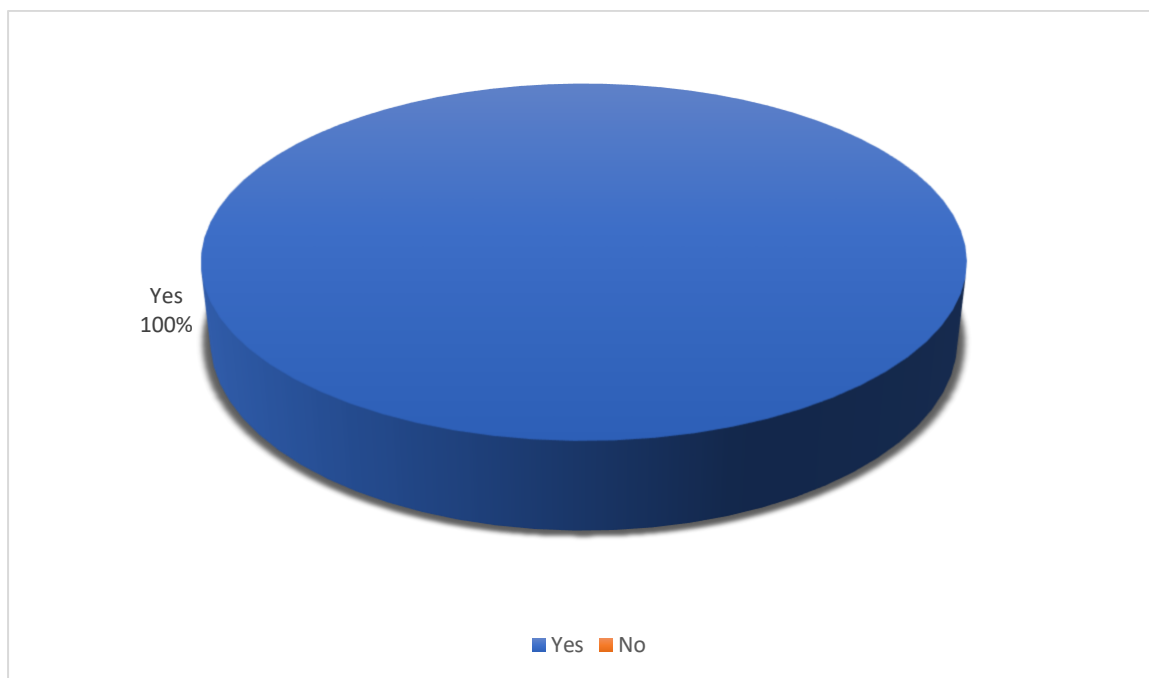
Figure 2.23. Teacher's Perception of Students' Writing Ability



This question was designed to gauge teachers' perceptions of the level of students in writing. Notably, 53% of the respondents reported that their students have a low level of writing, while 47% assessed their students' writing as being at an average level. Rating students' writing level as low and average indicates that this skill constitutes a challenge for many EFL students. This is possibly due to limited practice, insufficient feedback, or difficulties with some aspects of the language such as grammar and vocabulary, as hinted to in the analysis of the students' questionnaire.

Q05: Do you think that writing is a difficult task for your EFL students?

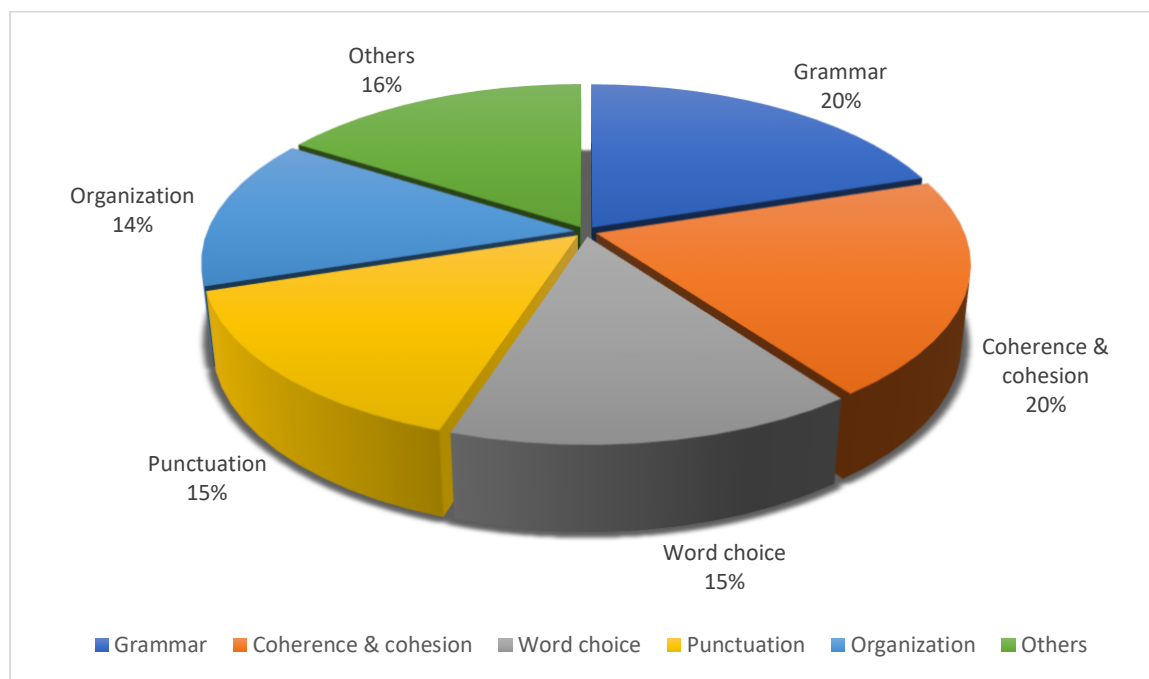
Figure 2.24. Teacher's Opinion of the Difficulty of Writing for Students



In light of the analyzed data, all of the participants (100%) consider the writing skill as a challenging task for EFL students. This implies that the teachers are fully aware and indeed recognize the fact that developing the writing skill is not an easy task, but rather one that requires consistent effort, practice, and support.

Q06: If yes, what are the most common challenges you observe in your students' writing?

Figure 2.25. Common Challenges Observed in Students' Writing



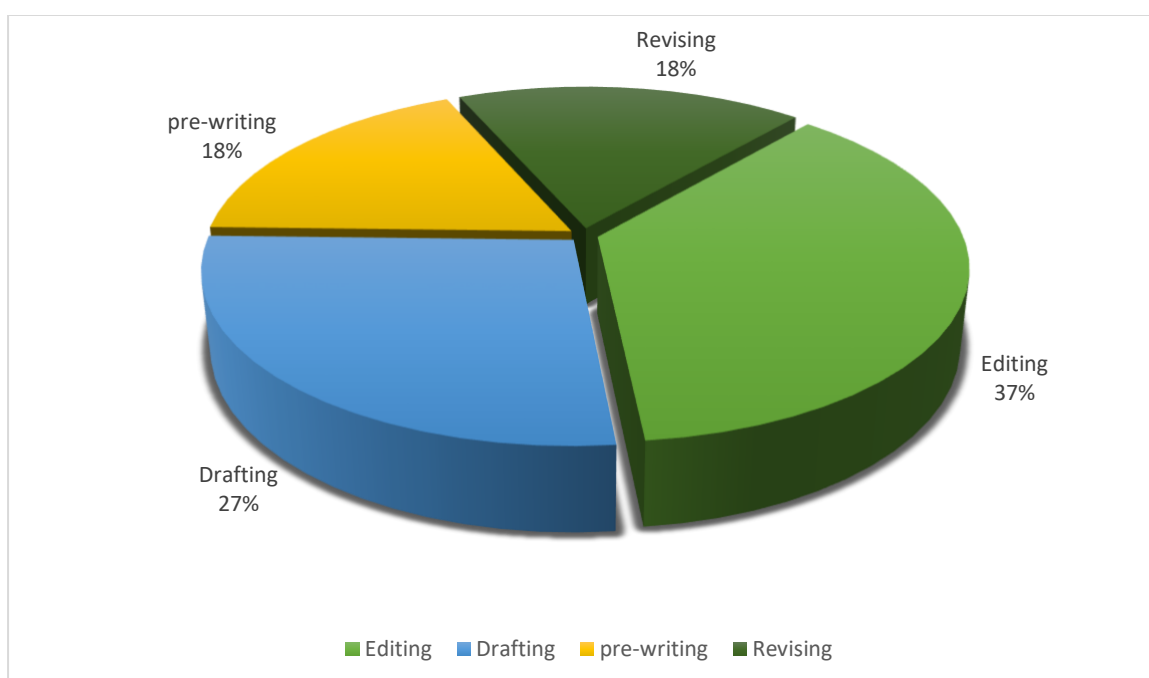
This question aims at uncovering the most common writing challenges students' face from the teachers' perspectives. The results demonstrate that grammar (20%) as well as coherence and cohesion (20%) are the most challenging areas for students. Furthermore, each of word choice and punctuation received similar response proportions (15%), while organization was selected by 14% of the participants. Based on the results, it is evident that teachers have observed a wide range of challenges in students' writing, with grammar and coherence/cohesion being the most frequently identified difficulties. In this same item, 16% of the respondents mentioned other challenges that can be summarized in the following points:

1. The influence of the mother tongue: students usually tend to literally translate sentences from the mother tongue to the target language.

2. Lack of information about the writing topic: students sometimes do not have adequate information to sufficiently address the topic. Consequently, their work lacks supporting ideas, details, and examples.
3. Problems in organizing ideas.
4. Problems of spelling.
5. The use of non-academic language.
6. Lack of vocabulary.

Q07: Which part of the writing stages do your students find difficult?

Figure 2.26. Teacher's Opinion of the Most Difficult Writing Stages



As demonstrated in the figure above, a large proportion of teachers, representing 37% of the total number, consider editing as the most challenging stage of the writing process for students. In addition to that, a relatively high percentage of the respondents (27%) reported that drafting is the most difficult stage. The remaining 36% of the responses are divided

between pre-writing (18%) and revising (18%). Based on the data presented, it is clear that all the stages of the writing process pose challenges for students. However, as it is noticeable, both editing and drafting are the most challenging stages. This can be attributed to the requirements the two stages impose. On the one hand, drafting requires students to generate and organize their ideas into a coherent structure. At this stage, many students may struggle with the lack of vocabulary, rich information, variety in sentence structure, grammar knowledge, or confidence which can make it difficult to express their ideas successfully. On the other hand, editing requires students to have a critical review ability regarding their work. That is to say, this stage requires language awareness and accuracy, which many students have not fully developed. Additionally, students may lack the necessary strategies to effectively identify and correct their own pieces of writing.

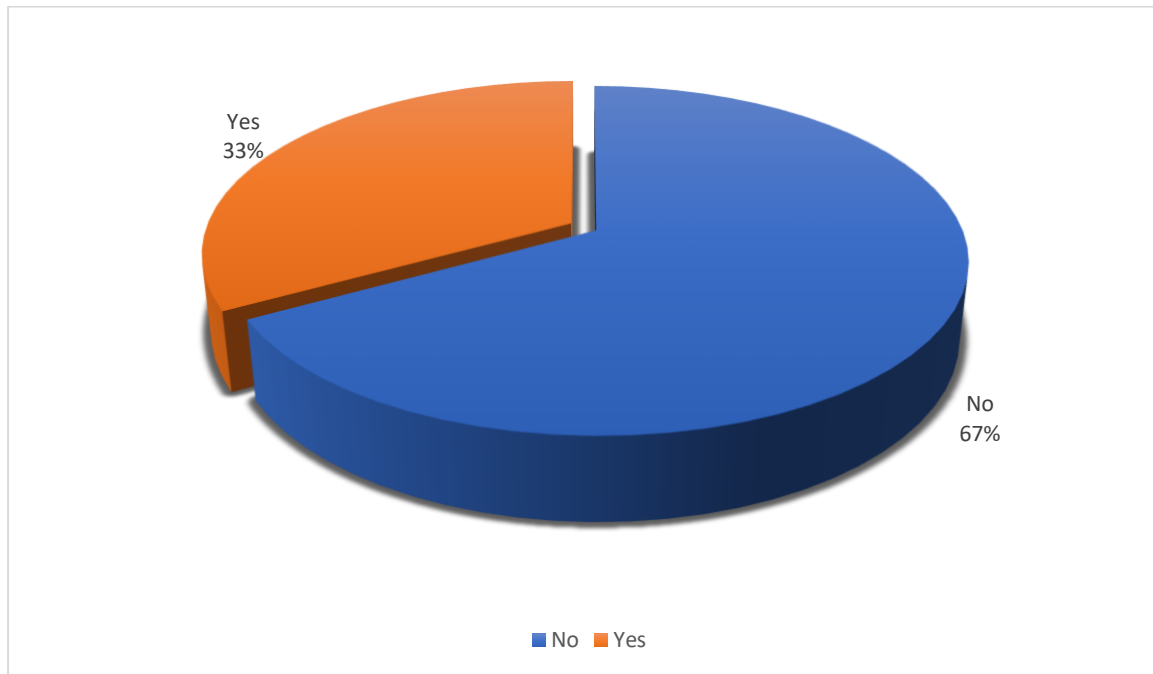
2.3.2.5.3. AI-Powered Personalized Learning and Writing

Q08: What is your attitude towards using AI-powered personalized learning tools in EFL classes? Please, justify.

This question is open-ended seeking to identify the teachers' attitudes towards using AI-powered personalized learning tools in EFL classes. The respondents contributed two different points of view. On the one hand, 53% of the sample explained having a positive attitude towards the use of AI tools in their classes since they can help students to generate new ideas, check for learning errors, and be guided for understanding complicated instructions. On the other hand, 47% reported that the only way for these tools to be beneficial in EFL classes is to use them moderately with the guidance of the teacher, but not as a replacement to human instructors.

Q09: Have you integrated AI-powered personalized learning tools into your English classes?

Figure 2.27. Teachers' Integration of AI Tools in Class



This question seeks to investigate the teachers' integration of AI-powered personalized learning tools in their English classes. As demonstrated in above, the majority of the participants (67%) have not integrated AI tools in their classes, while only 33% of them have. These results indicate that most of the respondents may not be keen on the idea of using AI tools, when a good number of them have already adopted these tools in their classrooms.

Q10: If yes, which AI tools have you integrated?

This question is open-ended aiming at exploring which AI-based tools teachers have used in their English classes. The majority of them reported using ChatGPT, while a number of them reported using other tools like Grammarly, Quilbot, perplexity, and Wordtune. These results suggest that a good number of teachers are comfortable with integrating AI tools in their English classes.

Q11: How do you use AI tools in your English classes to improve writing among students?

This open-ended question aims at having insight on how teachers use AI-powered tools to improve the writing skill among their students. Only 33% of the sample answered this question; the majority of them reported advising learners to do their writing assignments individually and then ask AI-powered tools like ChatGPT or Quilbot to check for grammar and spelling errors, correct them, and then provide them with personalized feedback. The rest of the respondents reported advising their students to use some AI tools to paraphrase, summarize, and check for references when doing a written assignment, in addition to using some AI-powered dictionaries to enrich their vocabulary.

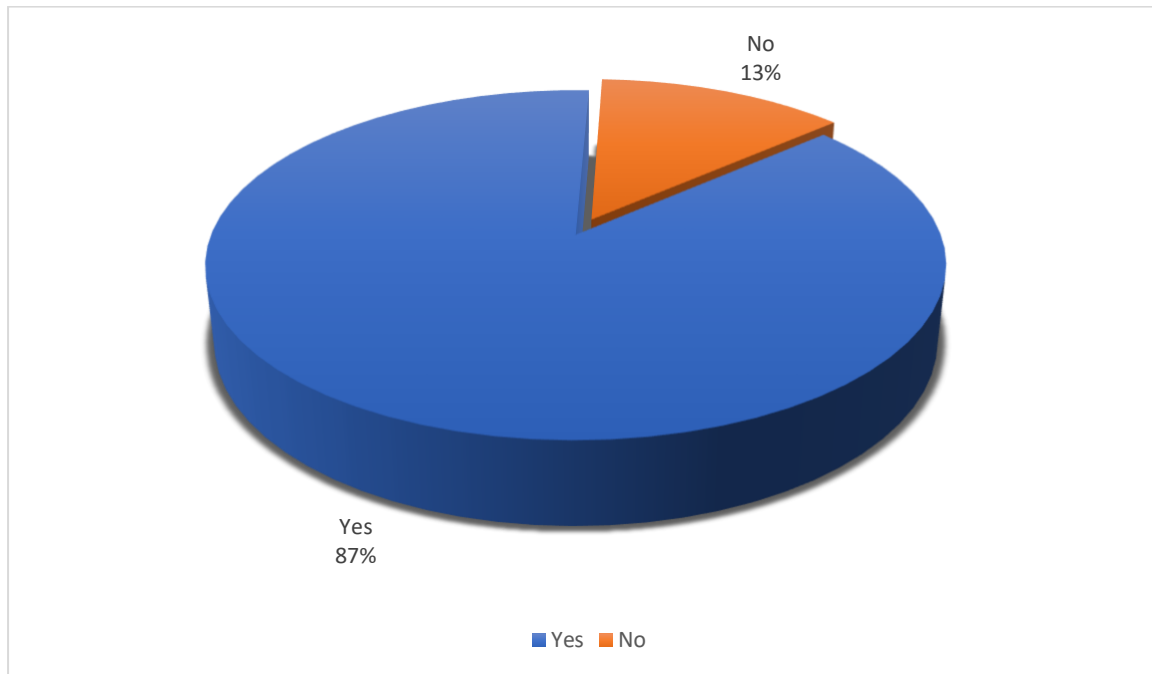
2.3.2.5.4. Recommendations and Feedback

Q12: In your opinion, what are the main benefits of using AI-powered personalized learning tools for improving the writing skill?

The aim behind this open-ended question is to have some insights on the teachers' perceptions about the main benefits of using AI-powered personalized learning tools for improving the writing skill. Twenty percent of the sample did not answer this question, while 80% provided some insight. The majority of the answers explained that the benefits of using these tools to improve writing lies in their ability to personalize the learning experience, provide answers, correct grammar, vocabulary, and spelling errors, help with personalized feedback, thus helping students to develop their writing abilities. Other teachers stated that these tools are beneficial because of their ability to guide and inspire the learners by suggesting and generating new ideas which help to enhance the quality of their work.

Q13: As a teacher, do you find teaching writing using AI-powered personalized learning tools more motivating and engaging for students compared to traditional methods?

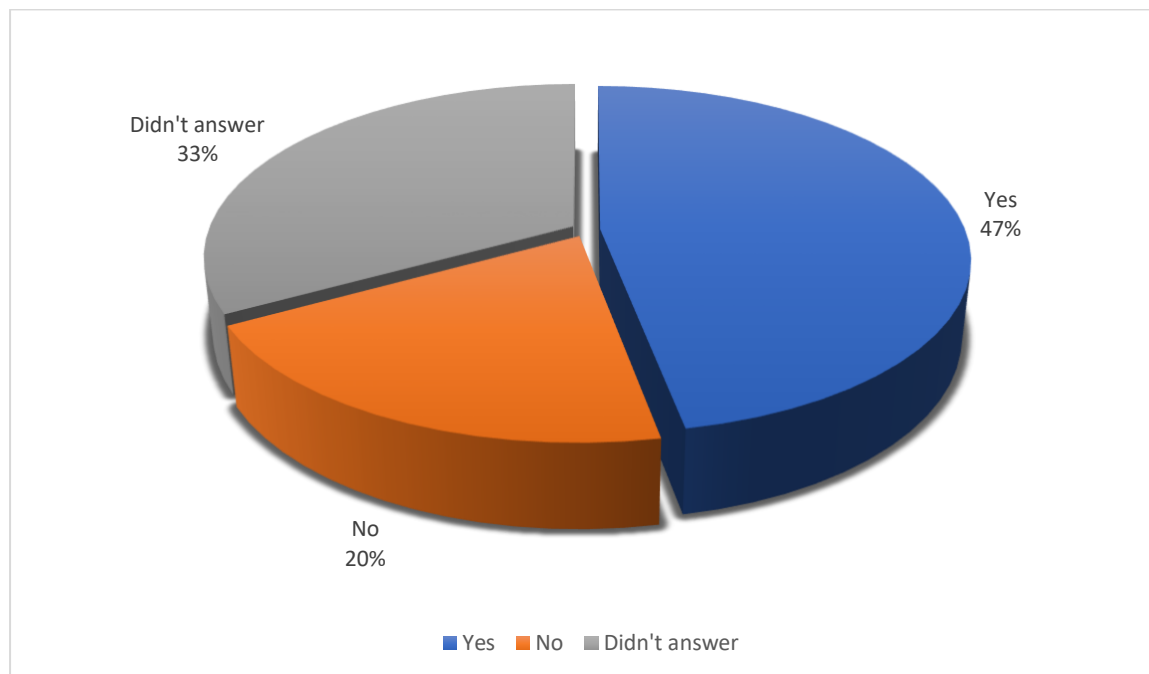
Figure 2.28. AI tools and Learner Engagement



This question attempts to assess the teachers' perceptions of how AI-powered personalized learning tools impact student motivation and engagement in writing instruction, in comparison to traditional teaching methods. As shown in the figure above, the majority of teachers (87%) find teaching writing using AI-powered personalized learning tools more motivating and engaging for students compared to traditional methods, while the remaining 13% see the opposite. These results indicate that the majority of teachers are more likely to use these AI tools to create a more engaging learning environment for the improvement of their students' writing.

Q14: If you used AI-powered tools that can personalize learning, have you noticed any improvement in the students' writing?

Figure 2.29. Teachers' Opinion on Students' Writing Progress Using AI Tools



A large number of respondents (47%) reported noticing improvement in their students' writing after using AI-powered personalized learning tools, while only 20% answered with 'No'. The remaining 33% did not answer the question. These results show that a good number of teachers confirm the effectiveness of using AI-powered personalized learning tools in improving the writing skill for the learners.

Q15: What are the different difficulties and challenges that you faced as a teacher when integrating AI-powered tools in teaching writing?

This question attempts to identify the different difficulties and challenges that teachers faced when integrating AI-powered tools in teaching writing. A significant number of teachers reported facing challenges related to authenticity, plagiarism and accuracy issues when AI is used. An equivalent number of teachers explained that among the main problems

that they face while integrating AI is convincing their students to use these tools appropriately without over-relying on them in order not to affect their creativity. The remaining teachers reported problems related to network issues when using these tools in class. This is an important issue which exacerbates the digital divide. These results indicate that there is still a number of challenges teachers should work on before a sound integration of AI-powered tools. Working on these issues would enable them as well as their students to use AI in the appropriate way and to achieve the best results regarding the learners' writing skill.

Q16: In your opinion, what is the best way to use AI-powered personalized learning tools for improving writing?

The purpose of this question is to get insight into the teachers' perceptions on the best way of using AI-powered personalized learning tools for improving the writing skill. The majority of teachers explained that the best way of using these tools is to use them as a guide. They added that students should be advised to use these tools only when it comes to difficult writing tasks, so that they avoid becoming over-dependent. Other teachers believe that efforts should be made to increase awareness among students of the ethical considerations of using these tools.

Q17: What advice would you offer to other teachers on effective integration of AI-powered personalized learning tools into their teaching practices?

When asked to suggest some advice for other teachers regarding the effective integration of AI tools in teaching practices, the participants offered a range of ideas based on their experience. A large number of teachers recommended to use those tools as a supplement and to advise students to use them in the same way. That is to say, such tools should be considered as a means for learning not the end itself, and AI-generated content should be

evaluated and double-checked before it is used. To elaborate, participants highlighted the importance of the human touch, saying that teachers should raise students' awareness to avoid excessive reliance as it can negatively affect their creativity.

Additionally, teachers suggested asking students to hide their phones before writing tasks. This procedure is believed to reduce students' excessive reliance on phones, which disrupts both their writing and classroom learning. Finally, the respondents proposed that both teachers and learners should receive training on how to use AI-powered personalized learning tools. It was recommended that teachers provide students with guidance on how to effectively exploit those tools so that the ethical issues and concerns can be minimized to a certain extent.

Q18: What are the main concerns and ethical issues of implementing AI in EFL classes?

The objective of this question is to explore teachers' perspectives on the ethical issues and challenges associated with using AI in EFL classes. Based on the answers provided by the teachers, four main concerns emerged including plagiarism, cheating, over reliance, and bias. It is notable that a good proportion of the teachers (40%) expressed concern about plagiarism. Additionally, cheating (20%) was reported as one of the challenges of such implementation. The same portion of teachers (20%) also mentioned that the use of AI may induce over-reliance as well as potential bias in AI-generated content. The data indicate that teachers are aware of the possible risks AI tools may pose in EFL classes. Moreover, it might be well conjectured that the drawbacks of AI may outperform the advantages if it is implemented without using it cautiously.

Q19: How can Artificial Intelligence be used ethically in the field of teaching writing?

This question seeks to understand the teachers' opinion of the potential ethical ways for implementing AI in the teaching of the writing skill. For the majority of the respondents,

avoiding over-reliance is one possible way for a safe integration of AI-powered learning tools. To clarify, the respondents emphasized the idea that AI-powered learning tools should be for guidance. For others, it is believed that these tools should be used under teachers' supervision. This means that teachers should follow up during tasks and provide learners with tips on how to utilize such tools positively.

Q20: Please feel free to share any additional thoughts or comments about your experience with AI-powered personalized learning tools.

Regarding this item, the participants were invited to add any information or comment drawing on their experience with AI. The respondents who answered this question consist 33% which is equivalent to 6 teachers. Some respondents highlighted the importance of integrating this technology in EFL classes, particularly for enhancing students' writing. Other participants underscored the necessity of drawing attention to the limitations and drawbacks that can be caused by the integration of such tools. Finally, teachers mentioned some obstacles that may hinder the integration of AI-powered tools such as network issues, lack of training in digital skills, and the problem of large classes.

2.3.2.6. Discussion of the Teachers' Questionnaire

For reminder purposes, the aim of the teachers' questionnaire was to explore their perceptions towards using AI-powered personalized learning tools in enhancing the students' writing skill. The analysis shows that the majority of the participants hold a PhD degree and they have taught English from two to more than five years, which indicates that they are relatively experienced, and they are able to provide significant insights concerning the current research. Based on the analysis, the results indicate that the writing skill is of a great importance for all teachers; still, it is also considered the most challenging skill for third-year students who have a number of difficulties in different areas of writing such as

coherence/cohesion and grammar. The teachers' responses demonstrate that a large group of students struggle in different stages of the writing process, especially drafting and editing.

Additionally, the data indicate the majority of the participants perceive AI-powered personalized tools as beneficial in improving the learners' writing skill and more engaging for students compared to the traditional methods even though a number of them were not able to integrate these tools in their classes.

Finally, the data reveal their various challenges and concerns regarding the implementation of AI tools such as over-reliance, cheating, bias, and plagiarism. They suggested some of the best ways for an effective use of these tools in order to overcome the related ethical concerns, and consequently achieve the desired results at the level of students' writing; these include using them as a guide and a supplement. The participants also advised teachers to supervise students when they use these tools. It was also recommended that students use AI only in case of utmost necessity and to solve the complicated writing tasks.

2.4. Discussion of the Main Findings

The current study addresses the challenge of enhancing the writing skill among third-year EFL learners at Mila University Center. It investigates the perceptions of both teachers and learners regarding the role of AI-powered personalized learning for the development of the writing skill. The findings derived from both the teachers' and the learners' questionnaires offer valuable perspectives into the current practices and perceptions regarding the use of AI tools.

When exploring the learners' perceptions, the study revealed widespread adoption of AI tools, the majority of students reported using of AI tools regularly. ChatGPT, in particular, has emerged as the most favored platform, primarily for grammar correction, vocabulary enhancement, and generating ideas. Although a good number of students reported finding

such tools beneficial for their writing, many also recognize possible drawbacks, including reduced creativity and the risk of becoming overly dependent on technological assistance. This suggests a rational attitude among learners, who value AI for providing helpful feedback, examples, and models, but still appreciate the need for active engagement and the teacher guidance in the writing process.

Additionally, the results revealed that the teachers overwhelmingly identified writing as an essential learning skill, in addition to pointing out ongoing difficulties with grammar, coherence, and structure faced by students. While the vast majority of the teachers considered AI-based tools more interactive than conventional learning resources, a small number of them have integrated these tools into their teaching. This reluctance is largely due to fears surrounding academic honesty, dangers of over-reliance on technology, and general ethical concerns. Teachers mostly approved the introduction of artificial intelligence as a supportive element, highlighting the importance of control and the teacher's guidance for a proper usage without weakening the primary teaching role of the teacher.

When comparing teachers' and learners' perceptions, both groups acknowledged the potential of AI-powered tools to address the writing challenges through personalized support and immediate feedback. However, a significant disagreement appeared in the implementation readiness, students actively embraced these tools for independent learning, while teachers advocated for more structured, supervised integration. This contrast underscores the generational gap in technology adoption and highlights the need for institutional frameworks that bridge this gap. Both groups ultimately agreed on the importance of moderate, purposeful use of AI tools to complement rather than replace traditional writing instruction. Additionally, for students, the most beneficial AI-powered personalized learning tools for improving writing are ChatGPT, Gemini, and Grammarly.

Similarly, teachers think that ChaGPT can be used by students for getting personalized feedback on grammar and spelling.

Finally, to answer the main question, it is evident that both students and teachers have positive perceptions towards the use of AI-powered personalized learning tools. Despite the noticeable reluctance on the part of the teachers, the integration of such tools is preferable providing that the related ethical concerns are taken into account.

2.5. Limitations and Recommendations

2.5.1. Limitations of the Study:

This research has encountered some limitations including:

1. Many teachers have not implemented AI-powered personalized learning in their teaching practices. Therefore, they were not able to answer many questions that might add valuable insights on the topic under investigation.
2. A number of students answered the questionnaire carelessly. They were just selecting answers randomly. In fact, this was obvious as the answers they provided were inconsistent.
3. Additionally, there was a noticeable reluctance in answering many open-ended questions on the part of both teachers and learners.
4. Another limitation of the current study is the small sample size which may limit the generalizability of the findings.
5. A further limitation is the exclusive focus on third-year students. This may restrict the applicability of the findings to other proficiency levels.
6. Moreover, this study exclusively focuses on the writing skill.

7. Finally, this study used a qualitative approach. While the latter provides detailed insights, it does not allow for statistical testing of the findings

2.5.2. Recommendations:

2.5.2.1. Recommendations for Pedagogy and Research:

The exploration of the teachers' and the learners' perceptions of the use of AI tools for the enhancements of writing can inform the teaching and learning practices. Based on the findings and the limitations of the current research, a number of recommendations can be provided for teachers, learners, and further research.

2.5.2.2. Recommendations for EFL Teachers

It is recommended for teachers:

1. As the majority of teachers and learners have positive perceptions concerning AI-powered personalized learning, it is recommended for teachers to adapt the integration of such tools in their teaching practices. Many students have reported some dissatisfaction related to the traditional ways of instruction including mainly boredom, lack of personalized feedback and practice. To address these issues teachers are advised to use AI tools during the practice stage; that is to say, the teacher can ask students to write their own composition and then with his guidance they submit their work to the AI tools and get personalized feedback. Based on this, they can refine the work along with the evaluation of the teacher.
2. Teachers should also raise students' awareness about the risks that might be imposed by AI tools. These include over-reliance, plagiarism, false facts, and privacy concerns.
3. In addition to raising the students' awareness, the teacher should have sufficient knowledge about these risks and how to minimize them so that he can avoid them and help his students overcome the aforementioned issues.

2.5.2.3. Recommendations for Students

For students a number of recommendations is presented as follows:

1. Students should not rely completely on AI tools when completing the writing tasks. For a better and effective use, AI tools should be utilized for overcoming the challenges that may emerge during the writing process. This means that they are meant to provide students with the necessary information for learning and not the end-product.
2. Students are also recommended to use AI-personalized learning tools for getting feedback related to grammar and vocabulary. Regarding the writing process, the use of such tools can be effective in the drafting stage as they can provide tips on the ideas to be included or focused on, and how to organize them. In the revising stage, AI tools may provide students with the necessary feedback on the aspects that can be improved in their written work.
3. Students are also encouraged to critically evaluate the content provided by AI tools as these tools are subject to bias and inaccuracy.

2.5.2.4. Recommendations for Curriculum Development

Curriculum developers are advised to:

1. Programs should be designed to train teachers on how to incorporate AI tools into their teaching practices effectively and how to possibly address related ethical concerns such as plagiarism, over-reliance, and bias. Additionally, teachers need guidance on how to supervise students' while using AI-powered personalized learning tools to ensure productivity and effectiveness.
2. Students should be trained on how to use AI tools ethically, avoiding over-dependence while taking advantage of them for enhancing their writing skill. For this purpose, institutions and curricula should focus on promoting students' digital literacy to help them critically assess AI-generated content and develop unique writing skills.

2.5.2.5. Recommendations for Future Research

For future research, it is recommended to investigate the effectiveness of AI-powered personalized learning in enhancing the other skills, as well as other language aspects. Moreover, extending future research to include diverse learner populations and various educational contexts would be insightful in order to gain a deeper understanding of the impact of AI-powered tools. Furthermore, researchers are invited to explore the ethical issues and possible challenges related to these adaptive learning systems; this is essential to ensure that all students are fairly and effectively supported.

Finally, future research should adopt a mixed method to ensure the findings are more reliable.

Conclusion

To sum up, this chapter attempted to explore the perceptions of third-year EFL students as well as teachers at Mila University Center concerning the use of AI-powered personalized learning tools in enhancing writing. The data were collected using two questionnaires. The findings revealed significant challenges faced by students. These include difficulties in grammar, vocabulary, pre-writing, and drafting. The findings denote teachers' observation of the persistent obstacles in the students' writing. Additionally, both teachers and students acknowledged the potential of AI-powered tools, such as ChatGPT and Grammarly, to address the aforementioned challenges; this can be possible through real-time feedback, error correction, and model text generation.

Teachers underscored the dual-edged nature of AI implementation, recognizing its capacity to personalize learning and increase learner engagement while drawing attention to the drawbacks it can cause, such as over-reliance, plagiarism, and other ethical concerns.

Students, however, demonstrated a positive attitude towards the use of AI tools, highlighting the need for a balanced usage. Furthermore, this research emphasizes the importance of fostering digital literacy and providing both teachers and learners with training to navigate the integration of AI effectively. Finally, recommendations include using AI tools as a source of feedback and guidance, establishing clear ethical frameworks, and encouraging students to rely more on themselves when completing the writing tasks. By addressing these considerations, institutions can take advantage of AI technology to enhance the writing skill and extend the advantage to other skills as well.

General Conclusion

As it has prevailed the educational field, there is an increasing call for investigating the use of AI technology in EFL contexts. This study aimed at exploring the perceptions of both EFL teachers and students concerning the use of AI-powered personalized learning tools for enhancing the writing skill. In order to achieve the aforementioned aim, a questionnaire was administered to third-year students at Mila University Center and another to teachers.

The analysis of the two questionnaires revealed valuable insight into the topic under investigation. Firstly, both teachers and students have positive perceptions about the use of AI-powered personalized learning. Moreover, both recognize the benefits of such learning tools and their ability to help enhancing the writing skill. Furthermore, the study highlighted the ethical concerns accompanied with the integration of AI-powered personalized learning. Finally, the analysis advanced some recommendations for an effective use of AI, aiming at mitigating the challenges these tools may cause.

Despite the valuable findings the current study revealed, it faced some limitations. Based on the findings and limitations, some recommendations for students, teachers, curriculum developers, and future research were suggested.

All in all, the exploration of teachers' and students' perceptions about the use of AI-powered personalized learning has provided insightful information that can inform the current instructional practices. To improve the writing skill, AI-powered personalized learning tools should be used for scaffolding in challenging aspects of the writing process. Additionally, to maximize the effectiveness of such tools, teachers and learners should receive appropriate training on how to implement them and possibly avoid the related ethical concerns.

References

- Adaptive US. (2025). What is AI-powered personalized learning and how to implement it. Retrieved April 15, 2025, from <https://www.adaptiveus.com/blog/ai-powered-personalized-learning/>
- Agatova, O., & Latipova, L. (2025). Exploring AI-powered personalized learning in universities. *International Journal of Evaluation and Research in Education (IJERE)*, 14(2), 837–848. <https://doi.org/10.11591/ijere.v14i2.29899>
- Alfadda, H. A., Mahdi, H. S., & Alkhamash, H. F. (2023). Enhancing academic writing skills and motivation: Assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students. *Frontiers in Psychology*, 14, 1260843. <https://doi.org/10.3389/fpsyg.2023.1260843>
- Aliouchouche, F. (2017). Developing the writing skills through reading and writing workshop strategy: The case of first year LMD students at University of Bejaia [Unpublished master's thesis]. University of Mohamed Lamine Debaghine Sétif.
- Alzahrani, F., Alghamdi, E., & Qutob, M. (2021). An insight into female EFL learners' difficulties and needs in writing: The case of secondary high schools in Saudi Arabia. *Arab World English Journal*, 2, 343–359. <https://doi.org/10.24093/awej/mec2.25>
- Anderson, M., & Anderson, K. (1998). *Text types in English*. Macmillan Education Australia.
- Avagyan, L. (n.d.). Different types of writing. American University of Armenia. Retrieved March 22, 2025, from <https://studentsuccess.aua.am>

- Aviran E, Blonder R (2023) The influence of learning with an online, personalized environment on students' attitudes, beliefs, and outcomes. *J Sci Educ Technol* 32(5):722–742. <https://doi.org/10.1007/s10956-023-10060-1>
- Axelrod, R. B., & Cooper, C. R. (2020). *The St. Martin's guide to writing* (12th ed.). Bedford/St. Martin's.
- Ayeni, O. O., Al Hamad, N. M., Chisom, O. N., Osawaru, B., & Adewusi, O. E. (2024). AI in education: A review of personalized learning and educational technology. *GSC Advanced Research and Reviews*, 18(2), 261–271. <https://doi.org/10.30574/gscrr.2024.18.2.0062>
- Bacha, N. N. (2002). Developing learners' academic writing skills in higher education: A study for educational reform. *Language and Education*, 16(3), 161–177. https://www.researchgate.net/publication/228914644_Developing_Learners'_Academic_Writing_Skills_in_Higher_Education_A_Study_for_Educational_Reform
- Badger, R., & White, G. (2000). A process genre approach to teaching writing. *ELT Journal*, 54(2), 153–160.
- Baghzou, S. (2021). Approaches to teaching writing in EFL context. *Journal of Arabic Language Sciences and Literature*, 7(1), 2802–2812.
- Barrot, J. S. (2020). Integrating technology into ESL/EFL writing through Grammarly. *RELC Journal*. Advance online publication. <https://doi.org/10.1177/0033688220966632>
- Bazerman, C. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science*. University of Wisconsin Press.
- Bell, J., & Burnaby, B. (1984). *A handbook for ESL literacy*. OISE Press.

- Biesta, G. (2019). "Should Teaching Be Replaced by AI? The Limits of Artificial Intelligence in Education." *Educational Philosophy and Theory*, 51(8), 757–766.
<https://doi.org/10.1080/00131857.2018.1541765>
- Black, P., & Wiliam, D. (1998). *Inside the black box: Raising standards through classroom assessment*. King's College London.
- Bommasani, R., Hudson, D. A., Adeli, E., et al. (2021). On the opportunities and risks of foundation models. arXiv preprint. <https://doi.org/10.48550/arXiv.2108.07258>
- Brown, A. (2007). *Teaching and learning communication, language and literacy*. Paul Chapman Publishing.
- Butt, U. J., Davelis, A., Abbod, M., Eghan, C., & Agbo, H. M. (2022). Improving Learning Experience and Privacy in Education Using the Power of Big Data and Artificial Intelligence. In *Integrated Business Models in the Digital Age: Principles and Practices of Technology Empowered Strategies* (pp. 371-424). Cham: Springer International Publishing.
- Calkins, L. M. (1994). *The art of teaching writing*. Heinemann.
- Canales Luna, J. (2024, August 12). AI in education. *DataCamp*. Retrieved April 14, 2025, from <https://www.datacamp.com/blog/ai-in-education>
- Cents For Sense. (2025, April 16). Is artificial intelligence the future of education? *TalkMarkets*. Retrieved April 12, 2025, from <https://talkmarkets.com/contributor/cents-for-sense/blog/is-artificial-intelligence-the-future-of-education?post=492711>

- Chai, C. S., Lin, P.-Y., Jong, M. S.-Y., Dai, Y., Chiu, T. K. F., & Qin, J. (2021). Perceptions of and Behavioral Intentions towards Learning Artificial Intelligence in Primary School Students. *Educational Technology & Society*, 24(3), 89-101. <https://www.jstor.org/stable/27032858>
- Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Explore*, 8, 75264–75278. <https://doi.org/10.1109/ACCESS.2020.2988510>
- Coenen, A., Davis, L., Ippolito, D., et al. (2021). Wordcraft: A human-AI collaborative editor for story writing. arXiv preprint arXiv:2107.07430
- Del Mar College Student Writing Center. (n.d.). Tone and style in literature. https://delmar.edu/offices/swc/_resources/Literature/tone-and-style.pdf
- Demme Learning. (2023, August 2). Why writing is important? Retrieved March 19, 2025, from <https://demmelearning.com/blog/why-is-writing-important/>
- Dizon, G. (2021). Using Grammarly to improve writing accuracy. *CALL Journal*.
- Elashri, I. I. (2013). The effect of the genre-based approach to teaching writing on the EFL Al-Azhar secondary students' writing skills and their attitudes towards writing. Mansoura University. <https://eric.ed.gov/?id=ED539137>
- Elbow, P. (1973). *Writing without teachers* (2nd ed.). Oxford University Press. <https://doi.org/10.1093/oso/9780195120165.001.0001>
- Evaniak, J. (2025, January 9). Opportunities and challenges using AI in personalized online education. *eLearning Industry*. Retrieved April 13, 2025, from <https://elearningindustry.com/opportunities-and-challenges-using-ai-in-personalized-online-education>

- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365–387.
- Gabrielatos, C. (2002). EFL writing: Product and process. https://www.researchgate.net/publication/234624105_EFL_Writing_Product_and_Process
- Gautam, P. (2019). Writing skill: An instructional overview. *Nepal Journals Online*. <https://www.nepjol.info/index.php/jong/article/view/26605>
- Ghosh, A., Gayen, P., & Sen, S. (2021). Developing writing skill in English of secondary school students: A process approach. *International Journal of Multidisciplinary Research and Development*, 8(4), 42–45. https://www.researchgate.net/publication/369481048_Developing_writing_skill_in_english_of_secondary_school_students_A_process_approach
- Grabe, W., & Kaplan, R. B. (1996). *Theory and practice of writing*. Longman.
- Graves, D. H. (1983). *Writing: Teachers and children at work*. Heinemann.
- Halliday, M. A. K., & Hasan, R. (1976). *Cohesion in English*. Longman.
- Harmer, J. (1998). *How to Teach English*. Longman.
- Harmer, J. (2007). *The Practice of English Language Teaching* (4th ed.). Person Longman.
- Hattie, J. (2012). Visible learning for teachers: Maximizing impact on learning. Routledge. <https://doi.org/10.4324/9780203181522>
- Heaton, J. B. (1975). *Writing English language tests*. Longman Group.
- Heaton, J. B. (1988). *Writing English language tests* (2nd ed.). Longman Group.

- Hedge, T. (2000). *Teaching and learning in the language classroom*. Oxford University Press.
- Helen. (2024, July 31). Personalized learning: How AI adapts to individual writing styles. *BusinessCheshire*. Retrieved April 13, 2025, from <https://www.businesscheshire.co.uk/2024/07/31/personalized-learning-how-ai-adapts-to-individual-writing-styles/>
- Hussain, S. M., Satti, S. M. J., Khan, Z., & Um-e-Safia. (2024). AI-powered personalized learning: Advancing language education in the digital era. *Journal of Social Signs Review*, 2(4), 730–731. <https://socialsignsreview.com/index.php/12/article/view/71/65>
- Huang, X., & Qiao, C. (2024). Enhancing Computational Thinking Skills Through Artificial Intelligence Education at a STEAM High School. *Science & Education*, 33(2), 383–403. <https://doi.org/10.1007/s11191-022-00392-6>
- Hwang, G.-J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, 1, Article 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Hyland, K. (2003). *Second Language Writing*. Cambridge: Cambridge University Press.
- Hyland, K., & Hyland, F. (2006). *Feedback in second language writing: Contexts and issues*. Cambridge University Press.
- Hyland, K. (2016). *Teaching and researching writing* (3rd ed.). Routledge.
- Javed, M., Juan, W. X., & Nazli, S. (2013). A study of students' assessment in writing skills of the English language. *International Journal of Instruction*, 6(2), 129–144.
- Johnston, P. H. (2004). *Choice words: How our language affects children's learning*. Stenhouse.

- Kadmiry, M. (2021). The comparison between the process-oriented approach and the product-oriented approach in teaching writing: The case of Moroccan EFL students in preparatory classes for the grandes ecoles. *Arab World English Journal*, 12(1), 198–214. <https://doi.org/10.24093/awej/vol12no1.14>
- Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability*, 15(15), 12451. <https://doi.org/10.3390/su151512451>
- Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons*, 62(1), 15–25. <https://doi.org/10.1016/j.bushor.2018.08.004>
- Katiyar, N., Awasthi, V. K., Pratap, R., Mishra, K., Shukla, N., Singh, R., & Tiwari, M. (2024). AI-driven personalized learning systems: Enhancing educational effectiveness. *Educational Administration: Theory and Practice*, 30(5), 11514–11524. <https://kuey.net/>
- Khan, J. M., & Jian, O. (n.d.). Personalized learning through AI. University of North Florida. *ResearchGate*.
https://www.researchgate.net/publication/376814707_Personalized_learning_through_AI
- Khosravi, H., Shum, S. B., Chen, G., Conati, C., Tsai, Y. S., Kay, J., ... & Gašević, D. (2022). Explainable artificial intelligence in education. *Computers and Education: Artificial Intelligence*, 3, 100074.
- Kim, J (2023) Leading teachers' perspective on teacher-AI collaboration in education. *Educ Inf Technol* 1–32. <https://doi.org/10.1007/s10639-023-12109-5>

- Kim, T. W., & Tan, Q. (2023). Repurposing text-generating AI into a thought-provoking writing tutor. arXiv. <https://doi.org/10.48550/arXiv.2304.10543>
- King, S. (2000). *On writing: A memoir of the craft*. Scribner.
- Klašnja-Milićević, A. and Ivanović, M., 2021. E-Learning personalization systems and sustainable education. *Sustainability*, 13(12), p. 6713. <https://doi.org/10.3390/su13126713>.
- Kleiman, G. M. (2023). Perspective: Educators need to understand and embrace artificial intelligence writing tools. *EDNC*. Retrieved April 11, 2025, from <https://www.ednc.org/perspective-educators-need-to-understand-and-embrace-artificial-intelligence-writing-tools/>
- Kroll, B. (Ed.). (1990). *Second language writing: Research insights for the classroom*. Cambridge University Press.
- Kumar, A., & Smith, B. (2024). Artificial intelligence tools in academic writing assistance: A comprehensive study of emerging tools and techniques. *International Journal of Innovative Research in Technology*, 11(3), 45–60. <https://www.academia.edu/123290962/...>
- Kumar, T. (2025). Approaches in teaching writing skills with creative writing: A TESOL study for Indian learners. *Prince Sattam Bin Abdulaziz University Journal*, 12(3), 45–60. <https://files.eric.ed.gov/fulltext/EJ1329510.pdf>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson. <https://doi.org/10.13140/RG.2.2.22576.87043>
- Luckin, R. (2018). *Machine Learning and Human Intelligence: The Future of Education for the 21st Century*. UCL Institute of Education Press.

- Maarof, N.; Yamat, H.; Li, K. L. (2011). Role of Teacher, Peer and Teacher-Peer Feedback in Enhancing ESL Students' Writing. *World Applied Sciences Journal 15 (Innovation and Pedagogy for Lifelong Learning)*: 29-35, IDOSI Publications.
- Makhambetova, A., Zhiyenbayeva, N., & Ergesheva, E. (2021). Personalized learning strategy as a tool to improve academic performance and motivation of students. *International Journal of Web-Based Learning and Teaching Technologies*, 16 (6). <https://doi.org/10.4018/IJWLTT.286743>
- Malhotra, P., Singh, Y., Anand, P., Bangotra, D. K., Singh, P. K., & Hong, W. C. (2021). *Internet of things: Evolution, concerns and security challenges. Sensors*, 21(5), 1809.
- Marr, B. (2023, July 24). The difference between generative AI and traditional AI: An easy explanation for anyone. *Forbes*. Retrieved April 19, 2025, from <https://www.forbes.com/sites/bernardmarr/2023/07/24/the-difference-between-generative-ai-and-traditional-ai-an-easy-explanation-for-anyone/>
- McCarthy, J. (1997). What is artificial intelligence? Stanford University. *ResearchGate*. https://www.researchgate.net/publication/28762490_What_is_Artificial_Intelligence
- McMahan, E., Day, S. X., & Funk, R. (1996). *Literature and the writing process*. Prentice-Hall.
- Miao, F., Holmes, W., Huang, R., & Zhang, H. (2021). AI and education: Guidance for policymakers.
- Miller, R. K. (2006). *Motives for writing*. McGraw-Hill.
- MIT Writing and Communication Center. (n.d.). The writing process. Retrieved March 23, 2025, from <https://cmsw.mit.edu/writing-and-communication-center/resources/writers/writing-process/>

- Mohammed Ahmed, A. A. (2022). Academic writing: Types, elements, and strategies. *International Journal of Language, Humanities, and Education*, 5(2).
<https://jurnal.stkippgribl.ac.id/index.php/ijlhe/article/download/989/1001>
- Moquin, S. (2024, November 26). Ethical considerations for AI use in education. *Enrollify*.
 Retrieved April 15, 2025, from <https://www.enrollify.org/blog/ethical-considerations-for-ai-use-in-education>
- Naval Postgraduate School Graduate Writing Center. (n.d.). Organization and structure.
<https://nps.edu/web/gwc/organization-and-structure>
- Nazari, N., Shabbir, M. S., & Setiawan, R. (2021). Application of Artificial Intelligence powered digital writing assistant in higher education: Randomised controlled trial. *Heliyon*, 7(5). <https://doi.org/10.1016/j.heliyon.2021.e07014>
- Nemouchi, A. (2008). Writing connection with grammar and literature in the study Organization of LMD system.
- Nobles, S., & Paganucci, L. (2015). Do digital writing tools deliver? Student perceptions of writing quality using digital tools and online writing environments. *Computers and Composition*, 38(1), 16-31. <https://doi.org/10.1016/j.compcom.2015.09.003>
- Nunan, D. (1989). *Designing tasks for communicative classrooms*. Cambridge University Press.
- Nurdianingsih, F., Fitriati, S. W., Astuti, P., & Rozi, F. (n.d.). Writing difficulties faced by EFL writing learners of English education study program. Proceedings of Fine Arts, Literature, Language, and Education. State University of Semarang.
<https://proceeding.unnes.ac.id/icoella/article/download/3710/3546/8650>

- OpsMatters. (2024). Harnessing AI for personalized learning: Revolutionizing education. Retrieved April, 22, 2025 <https://opsmatters.com/posts/harnessing-ai-personalized-learning-revolutionizing-education>
- Oxford University Press. (n.d.). Syntax. *Oxford Reference*. Retrieved March, 27, 2025, from <https://www.oxfordreference.com/display/10.1093/oi/authority.20110803100547813>
- Pane, J. F., Steiner, D. E., Baird, M., & Hamilton, L. S. (2017). Informing progress: Insights on personalized learning implementation and effects. RAND Corporation. <https://doi.org/10.7249/RR2042>
- Pangrazio, L., & Sefton-Green, J. (2022). The digital divide and AI literacy. *Learning, Media and Technology*, 47(1), 15-32.
- Parvez, S. (2024). How AI-based personalized learning is transforming education: The future is now. *SPCA Education*. Retrieved April 24, 2025, from <https://spca.education/how-ai-based-personalized-learning-is-transforming-education-the-future-is-now/>
- Pratama, M. P., Sampelolo, R., & Lura, H. (2023). Revolutionizing education: Harnessing the power of artificial intelligence for personalized learning. *Klasikal: Journal of Education, Language Teaching and Science*, 5(2), 350–357. https://www.researchgate.net/publication/378655261_REVOLUTIONIZING_EDUCATION_HARNESSING_THE_POWER_OF_ARTIFICIAL_INTELLIGENCE_FOR_PERSONALIZED_LEARNING
- Pinker, S. (2014). *The sense of style: The thinking person's guide to writing in the 21st century*. Viking.

- Pokrivcakova, S. (2019). Preparing teachers for the application of AI-powered technologies in foreign language education. *Journal of Language and Cultural Education*.
<https://doi.org/10.2478/jolace-2019-0025>
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Sa'adah, A. R. (2020). Writing skill in teaching English: An overview. *Educasia*, 5(1).
<https://www.educasia.or.id/index.php/educasia/article/download/41/27/>
- Saima.F. (2024, July 30). The impact of AI in education: Opportunities, challenges, and ethical considerations [LinkedIn post]. *LinkedIn*. Retrieved April 26, 2025, from
<https://www.linkedin.com/pulse/impact-ai-education-opportunities-challenges-ethical-saima-farhan-3zwnc>
- Scribophile. (n.d.). What is word choice? Retrieved March, 25, 2025, from
<https://www.scribophile.com/academy/what-is-word-choice>
- Selvaraj, M., & Aziz, A. A. (2019). Systematic review: Approaches in teaching writing skill in ESL classrooms. *International Journal of Academic Research in Progressive Education and Development*, 8(4), 450–473.
https://www.researchgate.net/publication/339458235_Systematic_Review_Approaches_in_Teaching_Writing_Skill_in_ESL_Classrooms
- Selwyn, N. (2019). "Should Robots Replace Teachers? AI and the Future of Education." Polity Press. Free AI writing tool with adaptive learning features. *Texta*. Retrieved April 16, 2025, from
<https://texta.ai/free-ai-writing-tool-with-adaptive-learning-features>

- Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researcher*, 29(7), 4–14. <https://doi.org/10.3102/0013189X029007004>
- Silitonga LM, Hawanti S, Aziez F, Furqon M, Zain DSM, Anjarani S, Wu TT (2023, August) The impact of AI chatbot-based learning on students' motivation in English writing classroom. In: International Conference on Innovative Technologies and Learning. Springer Nature Switzerland, Cham. pp. 542–549
- Sommers, N. (1980). Revision strategies of student writers and experienced adult writers. *College Composition and Communication*, 31(4), 378–388.
- Srour, K., Aqel, M., & Shawish, J. (2021). Enhancing EFL secondary school students' writing skills through a suggested model based on constructivism. *Education in the Knowledge Society (EKS)*. <https://doi.org/10.14201/eks.23937>
- Steele, V. (2004). Product and process writing. Retrieved on 5th Sept. 2010 from <http://www.englishonline.org.cn/en/teachers/workshops/teaching-writing/teaching-tips/product-process>
- Strickland, K., & Strickland, J. (2000). *Making assessment elementary*. Heinemann.
- Tangpermpoon, T. (2008). Integrating approaches to improve students' writing skills for English major students. *ABAC Journal*, 28(2), 1–9. https://www.researchgate.net/publication/254366466_INTEGRATED_APPROACHES_TO_IMPROVE_STUDENTS_WRITING_SKILLS_FOR_ENGLISH_MAJOR_STUDENTS
- The Building Blocks of Academic Writing. (2020). Tone and style. <https://opentextbc.ca/buildingblocks/chapter/tone-and-style/>

- Together in Literacy. (2023, May 10). 10 important components of writing in a structured literacy lesson. Retrieved April 4, 2025, from <https://www.togetherinliteracy.com/blog/10-important-components-of-writing-in-a-structured-literacy-lesson>
- Truss, L. (2003). *Eats, shoots & leaves: The zero tolerance approach to punctuation*. Gotham Books.
- Unleashing learning potential with personalized learning programs. (n.d.). *Hyperspace.mv*. Retrieved April 16, 2025, from <https://hyperspace.mv/unleashing-learning-potential-with-personalized-learning-programs/>
- Ur, P. (1991). *A course in language teaching*. Cambridge University Press.
- Vorobyeva, K. I., Belous, S., Savchenko, N. V., Smirnova, L. M., Nikitina, S. A., & Zhdanov, S. P. (2025). Personalized learning through AI: Pedagogical approaches and critical insights. *Contemporary Educational Technology*, 17(2), ep574. <https://doi.org/10.30935/cedtech/16108>
- Wang, J., Hussain, Y., & Mao, C. (2025). Artificial intelligence-driven personalized learning: Psychological implications and educational outcomes. *International Journal of Education Humanities and Social Sciences*, 2(1), 24–39. <https://doi.org/10.70088/3wms278>
- Warschauer, M. (2020). The paradoxical future of digital learning. *Learning, Media and Technology*, 45(3), 1–15. <https://doi.org/10.1080/17439884.2020.1707225>
- Weir, C. (1988). *Academic writing—can we please all the people all the time?* In P. C. Robinson (Ed.), *Academic writing: Processes and product* (pp. 17–34). ELT Document 129.

- White, E. M. (1986). *Assigning, responding, evaluating: A writing teacher's guide*. Bedford/St. Martin's.
- White, R. (1981). *Approaches to writing*. Guidelines, 6, 1–11.
- Widdowson, H. G. (1978). *Teaching language as communication*. Oxford University Press.
- Williams, J. M. (2005). *Style: Lessons in clarity and grace* (9th ed.). Pearson.
- Wilson, J., & Czik, A. (2021). Automated writing evaluation: A promising approach to formative feedback. *Language Learning & Technology*, 25(2), 22–38.
<https://doi.org/10.125/73438>
- Winans, M. D. (2021). Grammarly's tone detector: Helping students write pragmatically appropriate texts. *RELC Journal*, 52(2), 348-352.
<https://doi.org/10.1177/00336882211022735>
- Writers.com. (2023). What is word choice in writing? <https://writers.com/word-choice-in-writing>
- Xu, W., Ouyang, F., & Zhang, Q. (2021). AI-powered writing assistants in education: A systematic review. *Computers & Education*, 172, 104253.
<https://doi.org/10.1016/j.compedu.2021.104253>
- Xu, X. (2005). An integrated approach to the teaching of English writing. *Sino-English Teaching*, 2(12), 37–41.
- Yang, M., & Wen, F. (2023). AI-powered personalized learning journeys: Revolutionizing information management for college students in online platforms. *Journal of Information Systems Engineering and Management*, 8(1), 23196.
<https://doi.org/10.55267/iadt.07.14079>

- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 1–27.
<https://doi.org/10.1186/s41239-019-0171-0>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education—where are the educators?. *Educational Technology Research and Development*, 67(4), 2071-2099
- Zinsser, W. (2006). *On writing well: The classic guide to writing nonfiction* (30th ed.). HarperCollins.

Appendices

Appendix A: The Students' Questionnaire

Dear third year students,

This questionnaire is an attempt to gather the information needed for the accomplishment of a master dissertation. It aims at investigating the learners' perceptions towards the use of AI-powered personalized learning for the development of the writing skill. Your response will be a valuable contribution for achieving our research objectives.

Please put a tick (✓) in the box next to the answer that best represents your opinion, and answer using a full statement where necessary.

Thank you in advance for your insightful contribution and priceless time.

Section One: Background Information

1) Gender:

a) Female ☐ b) Male ☐

2) Was it your choice to study English at University?

a) Yes ☐ b) No ☐

3) How do you rate your level in English?

a) High ☐ b) Average ☐

b) Low ☐

Section Two: The Writing Skill

4) Is the writing skill important to you?

a) Very important ☐ b) Important ☐

c) Moderately important ☐ d) Not important ☐

5) How do you describe your writing ability?

- | | | | |
|------------|--------------------------|--------------|--------------------------|
| a) Poor | <input type="checkbox"/> | c) Good | <input type="checkbox"/> |
| b) Average | <input type="checkbox"/> | d) Excellent | <input type="checkbox"/> |

6) Are you satisfied with your writing level?

- | | | | |
|-------------------|--------------------------|-------------------------|--------------------------|
| a) Very satisfied | <input type="checkbox"/> | c) Moderately satisfied | <input type="checkbox"/> |
| b) Satisfied | <input type="checkbox"/> | d) Not satisfied | <input type="checkbox"/> |

7) Do you face any challenges while writing?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

8) If yes, what aspects of writing are most challenging for you? (Choose all that apply)

- | | | | |
|----------------------------|--------------------------|----------------|--------------------------|
| a) Coherence & cohesion | <input type="checkbox"/> | d) Punctuation | <input type="checkbox"/> |
| b) Grammar | <input type="checkbox"/> | e) Vocabulary | <input type="checkbox"/> |
| c) Spelling | <input type="checkbox"/> | | |
| f) Others (please specify) | | | |

.....

9) What are the most difficult stages in writing for you?

- | | | | |
|--------------------------------|--------------------------|-------------|--------------------------|
| a) Pre-writing (Brainstorming) | <input type="checkbox"/> | c) Drafting | <input type="checkbox"/> |
| b) Revising | <input type="checkbox"/> | d) Editing | <input type="checkbox"/> |

10) Is the way of teaching the writing skill at university satisfying for you?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

11) If no, why not?

.....

Section Three: AI-Powered Personalized Learning and Writing

12) Have you used any AI-powered tools to personalize your learning?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

13) If yes, how often do you use AI-powered tools to personalize your learning?

a) Daily ☐ b) Weekly ☐

c) Monthly ☐ d) Rarely ☐

14) Have you used any AI-powered personalized learning tools to improve your writing skill?

a) Yes ☐ b) No ☐

15) If yes, how often do you use AI-powered personalized learning tools for writing tasks?

a) Always ☐ b) Often ☐

c) Sometimes ☐ d) Rarely ☐

16) Which specific AI-powered tool(s) have you used to improve your writing skills? (Select up to 2 options)

a) Chat GPT ☐ b) Deepseek ☐

c) Gemini ☐ d) Quilbot ☐

e) Grammarly ☐

f) Others (please specify)

.....
.....

17) Do you find AI-powered personalized learning tools helpful in improving your writing abilities?

a) Yes ☐ b) No ☐

18) Which aspects of writing have these tools helped you with the most?

- | | | | |
|----------------------------|--------------------------|-------------------------|--------------------------|
| a) Personalized feedback | <input type="checkbox"/> | b) Coherence & cohesion | <input type="checkbox"/> |
| c) Grammar | <input type="checkbox"/> | d) Vocabulary | <input type="checkbox"/> |
| e) Punctuation | <input type="checkbox"/> | f) Enhanced creativity | <input type="checkbox"/> |
| g) Others (please specify) | | | |
| | | | |
| | | | |

19) What AI-powered personalized learning tools do you think are the most beneficial for improving the writing skill?

- | | | | |
|----------------------------|--------------------------|-------------|--------------------------|
| a) Chat GPT | <input type="checkbox"/> | b) Deepseek | <input type="checkbox"/> |
| c) Gemini | <input type="checkbox"/> | d) Quilbot | <input type="checkbox"/> |
| e) Grammarly | <input type="checkbox"/> | | |
| f) Others (please specify) | | | |
| | | | |
| | | | |

Section Four: Recommendations and Feedback

20) Based on your experience, do you recommend the use of AI-powered personalized learning tools for the improvement of the writing skill?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

21) Suggest the most beneficial way for using these tools for improving the writing skill.

.....

.....

.....

.....

22) Please feel free to share any additional thoughts or comments about your experience with AI-powered personalized learning tools.

.....

.....

Thank you for your cooperation.

Appendix B: The Teachers' Questionnaire

Dear EFL teachers,

You are kindly requested to participate in the current study by answering the following questionnaire which seeks to gather the teachers' perceptions towards the use of AI-powered personalized learning for the development of the learners' writing skill.

Please put a tick (✓) in the box next to the answer that represents your opinion the most, and do please answer in a full statement whenever necessary.

We deeply appreciate your valuable participation. Thank you in advance.

Section One: Background Information

1) What's your academic degree?

- a) Bachelor / License ☐
- b) Master ☐
- c) Magister ☐
- d) PHD ☐

2) How long have you been teaching English as a foreign language?

- a) 1 year ☐
- b) 2-5 years ☐
- c) More than 5 years ☐

Section Two: The Writing Skill

3) To what extent do you think the writing skill is important for achieving academic success in EFL classes?

- | | | | |
|-------------------|--------------------------|-------------------------|--------------------------|
| a) Very important | <input type="checkbox"/> | c) Moderately Important | <input type="checkbox"/> |
| b) important | <input type="checkbox"/> | d) Not important | <input type="checkbox"/> |

4) How would you rate your students' current level of writing ability?

- | | |
|------------|--------------------------|
| a) High | <input type="checkbox"/> |
| b) Average | <input type="checkbox"/> |
| c) Low | <input type="checkbox"/> |

5) Do you think that writing is a difficult task for your EFL students?

- | | | | |
|--------|--------------------------|-------|--------------------------|
| a) Yes | <input type="checkbox"/> | b) No | <input type="checkbox"/> |
|--------|--------------------------|-------|--------------------------|

6) If yes, what are the most common challenges you observe in your students' writing?

- | | | | |
|----------------------------|--------------------------|----------------|--------------------------|
| a) Organization | <input type="checkbox"/> | d) Punctuation | <input type="checkbox"/> |
| b) Word choice | <input type="checkbox"/> | e) Grammar | <input type="checkbox"/> |
| c) Coherence & Cohesion | <input type="checkbox"/> | | |
| f) Others (please specify) | | | |

.....

7) Which part of the writing stages do your students find difficult?

- | | |
|--------------------------------|--------------------------|
| a) Pre-writing (Brainstorming) | <input type="checkbox"/> |
| b) Drafting | <input type="checkbox"/> |
| c) Revising | <input type="checkbox"/> |
| D) Editing | <input type="checkbox"/> |

Section Three: AI-powered Personalized Learning and Writing

- 8) What is your attitude towards using AI-powered personalized learning tools in EFL classes? Please, justify.

.....

- 9) Have you integrated AI-powered personalized learning tools into your English classes?

a) Yes ☐

b) No ☐

- 10) If yes, which AI-based tools have you integrated?

.....

- 11) How do you use AI tools in your English classes to improve writing among students?

.....

Section Four: Benefits, Challenges, and Recommendations

- 12) In your opinion, what are the main benefits of using AI-powered personalized learning tools in improving the writing skill?

.....

- 13) As a teacher do you find teaching writing using AI-powered tools that can personalize learning more motivating and engaging for students compared to traditional methods?

a) Yes ☐

b) No ☐

- 14) If you used AI-powered tools that can personalize learning, have you noticed any improvements in the students' writing?

a) Yes ☐

b) No ☐

15) What are the different difficulties and challenges that you faced as a teacher when integrating AI-powered tools in teaching writing?

.....
.....
.....

16) In your opinion, what is the best way to use AI-powered personalized learning tools for improving writing effectively?

.....
.....
.....

17) What advice would you offer to other teachers on how to effectively integrate AI-powered personalized learning tools into their teaching practices?

.....
.....
.....

18) What are the main concerns and ethical issues of implementing AI in EFL classes?

.....
.....
.....

19) How can Artificial Intelligence be used ethically in the field of teaching writing?

.....
.....
.....

20) Please feel free to share any additional thoughts or comments about your experience with AI-powered personalized learning tools.

.....
.....
.....

Thank you for your cooperation.

ملخص

يمثل تحسين مهارة الكتابة لدى متعلمي اللغة الإنجليزية كلغة أجنبية تحديًا، خاصة عندما لا تكون التعليمات مخصصة ولا تتوافق مع احتياجات المتعلمين. نتيجة لذلك، أصبح دمج التكنولوجيا المدعومة بالذكاء الاصطناعي أمرًا بالغ الأهمية، لا سيما وأنها توفر رحلة تعلم مخصصة. تهدف الدراسة الحالية إلى استكشاف تصورات معلمي ومتعلمي اللغة الإنجليزية كلغة أجنبية حول استخدام التعلم المخصص المدعوم بالذكاء الاصطناعي لتطوير مهارة الكتابة لدى المتعلمين. ولتحقيق هدف هذه الدراسة، تم طرح الأسئلة التالية: (1) ما هي تصورات طلاب اللغة الإنجليزية كلغة أجنبية نحو استخدام التعلم المخصص بالذكاء الاصطناعي لتعزيز مهارة الكتابة؟ (2) ما هي تصورات المعلمين بشأن فعالية التعلم المخصص المدعوم بالذكاء الاصطناعي في تطوير مهارة الكتابة؟ (3) إلى أي مدى يستخدم طلاب السنة الثالثة التعلم المخصص المدعوم بالذكاء الاصطناعي لتحسين مهاراتهم الكتابية؟ (4) ما هي الأدوات المختلفة المدعومة بالذكاء الاصطناعي التي يستخدمها الطلاب لتحسين مهارة الكتابة لديهم؟ وللإجابة على هذه الأسئلة، تم توزيع استبيانين على عينة مكونة من 15 معلمًا للغة الإنجليزية كلغة أجنبية و70 طالبًا من طلاب السنة الثالثة في المركز الجامعي بميلة. كشفت نتائج هذه الدراسة أن المعلمين والمتعلمين على حد سواء لديهم تصورات إيجابية نحو دمج التعلم المخصص المدعوم بالذكاء الاصطناعي لتطوير مهارة الكتابة. علاوة على ذلك، تكشف النتائج أيضًا أن معظم الطلاب يستخدمون هذه الأدوات أحيانًا لتحسين مهاراتهم في الكتابة. والأدوات الأكثر استخدامًا من قبل الطلاب هي ChatGPT و Gemini و Grammarly . أخيرًا، تختتم هذه الدراسة بطرح عدد من القيود مثل صغر حجم العينة والتركيز الحصري على طلاب السنة الثالثة. بالإضافة إلى ذلك، تم تقديم بعض التوصيات التربوية، بما في ذلك توعية الطلاب بالمخاطر المحتملة لاستخدام أدوات التعلم المخصص بالذكاء الاصطناعي وتصميم برامج توفر للمعلمين تدريبًا كافيًا للتنفيذ الفعال لمثل هذه الأدوات.

الكلمات المفتاحية: الذكاء الاصطناعي، أدوات التعلم المخصص المدعوم بالذكاء الاصطناعي، مهارة الكتابة، تصورات المعلمين، تصورات الطلاب، اللغة الإنجليزية كلغة أجنبية.

Résumé

L'amélioration de la compétence en écriture chez les étudiants d'Anglais Langue Étrangère (ALE) est un défi, surtout lorsque l'enseignement n'est pas adapté et ne correspond pas à leurs besoins. Par conséquent, l'intégration des technologies basées sur l'Intelligence Artificielle (IA) est devenue vitale, d'autant plus qu'elles offrent un parcours d'apprentissage personnalisé. La présente étude vise à explorer les perceptions des enseignants et des étudiants d'ALE concernant l'utilisation de l'apprentissage personnalisé basé sur l'IA pour le développement de la compétence en écriture des étudiants. Pour atteindre l'objectif de cette étude, quatre questions de recherche ont été soulevées (1) Quelles sont les perceptions des étudiants d'ALE envers l'utilisation de l'apprentissage personnalisé par l'IA pour l'amélioration de la compétence en écriture ? (2) Quelles sont les perceptions des enseignants concernant l'efficacité de l'apprentissage personnalisé basé sur l'IA dans le développement de la compétence en écriture ? (3) Dans quelle mesure les étudiants de 3eme utilisent-ils l'apprentissage personnalisé basé sur l'IA pour améliorer leur compétence en écriture ? (4) Quels sont les différents outils basés sur l'IA que les étudiants utilisent pour améliorer leur compétence en écriture ? Afin de répondre à ces questions, deux questionnaires ont été distribués à un échantillon de 70 étudiants de troisième année d'anglais et de 15 enseignants d'ALE du Centre Universitaire de Mila. Les résultats de cette étude révèlent que les enseignants et les apprenants ont des perceptions positives envers l'intégration de l'apprentissage personnalisé basé sur l'IA pour le développement de la compétence en écriture. En outre, les résultats révèlent également que la plupart des étudiants utilisent parfois ces outils pour améliorer leurs compétences en écriture. Les outils les plus utilisés par les étudiants sont : ChatGPT, Gemini et Grammarly. Enfin, cette étude se conclut par la présentation d'un certain nombre de limites, telles que la petite taille de l'échantillon et le ciblage exclusif sur les étudiants de troisième année. De plus, quelques recommandations

sont présentées pour la pédagogie, notamment la sensibilisation des étudiants aux risques potentiels liés à l'utilisation d'outils d'apprentissage personnalisés basés sur l'IA et la conception de programmes offrant aux enseignants une formation suffisante pour la mise en œuvre efficace de ces outils.

Mots-clés : Intelligence artificielle, outils d'apprentissage personnalisé basé sur l'IA, la compétence en écriture, les perceptions des enseignants, les perceptions des étudiants, Anglais Langue Étrangère.