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**The Role of Artificial Intelligence in Enhancing Academic
Research Efficiency**

**Case Study of Master Two Students at Abdelhafid Boussouf University
Center- Mila**

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

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Abstract

The current study explores the use of Artificial Intelligence in (AI) in Academic Research (AR). It aims to shed light on the importance, challenges and ethical considerations of implementing AI in Academic research. A mixed research method was adopted in this research. Data were collected via a students' questionnaire directed to Master Two students at Abdelhafid Boussouf University Centre-Mila. The findings reveal strong support for the integration of AI tools in the academic research process, as learners show adequate digital and language proficiency to use these tools effectively, particularly for tasks such as citation, grammar checking, paraphrasing, summarizing, and generating ideas. The majority of the participants have positive perceptions of AI tools and they incorporate them regularly in their academic research. However, several challenges remain, including concerns related to accuracy, trustworthiness, plagiarism, data privacy, bias, and overreliance on AI. Ultimately, the research offers recommendations and suggestions to support the effective and ethical use of AI in Academic Research.

Key words: AI, Academic Research, Research Efficiency, Enhancing Academic Research

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Dedication

In the name of Alllah, the most Merciful, the Most Compassionate

I dedicate this work to:

My loving parents, for their endless love, prayers and sacrifice.

Thank you for always being there for me. Your support, care, and encouragement made this journey possible. I wouldn't have come this far without you.

Zineb.

Dedication

I dedicate my thesis :

To my **father Brahim** my strongest pillar and greatest support . With all my love and gratitude, I dedicate this achievement to you for you were the light of my path, my source of strength, and the one who endured endlessly so I could succeed. No words of thanks can ever match your sacrifices, but I promise to keep making you proud, as you have always been of me. This degree is a fruit from the garden of your patience and love.. Let it be yours before it is mine.

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List of Abbreviation and Acronyms

AI: Artificial Intelligence

AR: Academic Research

Apps: Applications

NLP: Natural Language Processing

SLA: Second Language Acquisition

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General Introduction

1. Literature Review

Artificial Intelligence (AI) embodies a pivotal branch within the realm of computer science and is characterized as the field dedicated to the advancement of intelligent machines (Mertala et al., 2022). The objective of AI is to develop sophisticated machines capable of acquiring knowledge and analyzing data, thereby emulating human behavior.

Moreover, AI powered tools and Chatbots are visible to be aimed at reply to individuals' questions. Fortunately, these tools are essentially founded on numerous theoretical frameworks that work together to offer instruction techniques that enhance the learning process.

Chan and Hu (2023) stated that Artificial Intelligence tools may provide students with a tailored learning experience by allowing them to study on their own and customize learning to their preferred learning style. With AI tools' immediate feedback, learners can get involved in the learning process and be encouraged to seek clarification and recommendation when necessary to better understand what they are learning.

Additionally, Alzahrani (2023) conducted a study to explore students' attitudes and behaviors towards AI in university. The study findings reveal that participants' perception regarding AI tools influenced their choice to use AI at university. The intriguing thing about this study is that perceived risks and effort anticipation were discovered to have an immediate effect on forming students' attitudes, affecting how students embraced and utilized AI in the learning process.

The implementation of AI tools has recently taken a major turn, particularly after open AI introduced ChatGPT in 2022 (Caldarini et al., 2022). The emergence of ChatGPT prompted interest among businesses and individuals alike, particularly students, who wanted to use its

features for rapid and efficient answers to a range of difficulties such as discussions, music production, narrative authoring, and assignment explanation. This technology, based on cognitive retrieval and learning algorithms, produces human-like writing by analyzing and interpreting massive volumes of data, including linguistic patterns and structures (Grassini, 2023; Haleem et al., 2022).

Moreover, Khan's (2023) paper, "Ethics of Assessment in Higher Education - an Analysis of AI and Contemporary Teaching," investigates how artificial intelligence interacts with and enriches present educational techniques. The work illustrates how AI can assist customize learning experiences, optimizing educational resources, and promoting innovative teaching practices. The investigation basically states that guaranteeing equal distribution of AI advantages undoubtedly boost students' overall growth in higher learning.

This thesis, on the other hand, specifically looks at how master 2 students at Abdelhafid Boussouf Mila University Centre use AI tools for enhancing their academic research efficiency. This research aims to add further insights to the use of AI tools in education settings in examining its role in Academic Research Efficiency in particular.

2. Statement of the problem

In this era of tremendous technological development, it is widely acknowledged that Artificial Intelligence (AI) has become increasingly prominent in a variety of fields, including education. The implementation of AI in education has transformed learning and research, enabling English as Foreign Language (EFL) learners to cope with this digital age. Interestingly, EFL graduate students can struggle to produce high quality dissertations simply because insufficient knowledge of Academic Research (AR) practices.

The emergence of AI applications presents new possibilities for supporting academic research. While these tools are becoming increasingly accessible to students, especially at the

graduate level, there is still a gap in understanding how students perceive, adopt and experience AI in their research work.

Furthermore, the potential of AI in enhancing efficiency, idea generation, ethical use and institutional guidance are yet to be fully examined. Using AI powered tools in this setting raises questions about the influence of AI in enhancing research efficiency and outcomes of graduate students. Thus, it is critical to evaluate the role of AI in enhancing research efficiency among graduate students as a factor that facilitates their research process.

3. Research Aims

The present study aims:

1. To explore the extent to which Master II students use AI applications as assistant tools in their research.
2. To examine the ways in which Master II students implement AI tools in their research process.
3. To assess the impact of AI applications on enhancing the research process.
4. To identify the challenges Master II students face when implementing AI-based research assistant tools.
5. To investigate the ethical considerations involved in integrating AI tools into academic research.

4. Research Questions

In view of what precedes, the concern of this study sets out to answer the following questions:

1. Do Master 2 students utilize AI applications as assistant tools to support their research?
2. In what ways do Master 2 incorporate these tools into their research process?

3. To what extent do these AI applications enhance the research process?
4. What are the challenges Master 2 students may find while implementing these research assisted tools?
5. What ethical considerations should be taken into consideration while integrating AI tools in academic research?

5. Research Methodology

In order to achieve the research aims and answer the research questions, a mixed-methods approach was adopted in this research. A questionnaire has been designed for master 2 students. The current study is conducted at the University Center of Mila, Institute of Letters and Languages, Department of Foreign Languages. The population that this study is concerned with consists of Master 2 EFL students at Mila University Center. Data obtained will be analyzed quantitatively and qualitatively in order to find answers for the research questions and shed light on the importance of implementing AI in academic research ethically.

6. Structure of the Study

This dissertation consists of two chapters; the first chapter covers the theoretical part. It presents the literature review for the present study. The second chapter covers the practical part; it explains the methodology and tools to be utilized, along with an analysis of the findings, including recommendations and suggestions.

Chapter One

Artificial Intelligence and Academic Research

Chapter One: Artificial Intelligence and Academic Research

Introduction

The integration of AI in the field of academic research could revolutionize how researchers gather information and analyze data with the addition of automation to this process. This addition could play a major role in accelerating the process of academic research and promote its outcomes. Therefore, the present chapter highlights the use of AI in the field of academic research to examine the benefits that this use could add to the field and also draw attention to the drawbacks that could result from this revolutionary approach. It includes two sections, the first section is dedicated to demonstrate the AI technology and its features, and the second one highlights the field of academic research.

Section One: Artificial Intelligence

1.1.1. Definition

According to Ramos, et al, (2023), AI is defined as the ability of computer systems to perform activities requiring human-like intellect, such as decision-making, natural language processing and production, problem-solving, and learning. Thus, it is a machine-based generation of knowledge and information based on human-like intellect. This is a vast domain that forms the center of technological development in the 21st century. There are many trending scientific attempts that aim nowadays to use human intellect in creating robots that could replace people in real life tasks and activities. These Chatbots are designed to think as human and generate automated information in a few seconds to answer any inquiry or perform any task that is required from them. Therefore, AI encompasses the epitome or the maximized knowledge of humans that is delivered in machine-like efficiency.

In fact, the definition that has been provided by the Stanford University corresponds with the one provided above. It states that AI is a term that has been first used by John

McCarthy, a retired professor at Stanford, in 1955 and he described it as the science of creating intelligent machines (Manning, 2020). This shows that the core objective or aim of AI is to make robots that have the intellect of the human brain. Since it is a machine and devoid of human emotions, AI is intended to be a more effective and efficient machine that could use human intelligence and maximize its potential and ability to perform different tasks and activities.

1.1.2. Evolution of Artificial Intelligence

The first time the term AI was used was in 1995 by John McCarthy, who is in fact named “the father of AI”. He did not only coin the term of this technology, but he also arranged the Dartmouth convention in 1956 that marked the official birth and emergence of AI (Sharma, et al, 2024). This shows that AI was initially started in the middle of the 20th century for the aim of creating smart machines with human intellect. This marked a shift in the world of technology and science, moving from human-operated and controlled machines into a new type of machines that are characterized with human-like intelligence and capable of solving problems and thinking as humans. Moreover, after the introduction of the concept of intelligent machines in this conference, several developments followed. Some of these major developments are summarized in the following table to highlight the most important events that characterize the development of AI from the 1950s to 1970s (See Figure 1.1).

1952	Checkers was the first program to demonstrate that computers can learn and not just perform what they are programmed to do. Checkers attracted media attention and learned to play at a level high enough to challenge a decent amateur human player (Samuel 1960).
1955	The Logic Theorist had proven 38 theorems from Principia Mathematica and introduced critical concepts in artificial intelligence, like heuristics, list processing, 'reasoning as search,' etc. (Newell et al. 1962).
1957	Inspired by the human brain, Rosenblatt discovered the perceptron. The perceptron was predicted to be "the embryo of an electronic computer that will be able to walk, talk, see, write, reproduce itself and be conscious of its existence." The perceptron was the birth of connectionism, the foundation of Neural Networks (NN) and Deep Learning (Rosenblatt 1961).
1961	Machine Educable Nougats And Crosses Engine (MENACE) was one of the first programs capable of learning to play a perfect game of Tic-Tac-Toe (Michie 1963).
1965	ELIZA was a natural language processing system that imitated a doctor. ELIZA responded to questions like a psychotherapist. Some users believed they are interacting with another human being until it reached its limitations, and the conversation became nonsense (Weizenbaum 1966).
1969	Shakey the Robot was the first general-purpose mobile robot capable of reasoning its actions. This project integrated research in robotics with computer vision and natural language processing, thus being the first project that combined logical reasoning and physical action (Bertram 1972).
1969	The book "Perceptrons" highlighted unrecognized limits of the feed-forward, two-layered perceptron structure. The authors' pessimistic predictions made a fundamental shift in the AI research direction to symbolic and disregarding connectionism. "Perceptrons" marks the beginning of the AI winter of the 1970s (Minsky and Seymour 1969).

Figure 1: Important AI Development Events (Delipetrev, et al., 2020. p. 7).

The table shows that the conference of Dartmouth (1956) was proceeded with the discovery that computers are able to learn instead of just executing what they are programmed to do. This discovery led to the development of logic theory and to the initiation of research in the field of creating machines that are able to think and reason like human beings. After the introduction of this theory in the conference, Rosenblatt discovered the perception modeling, which envisioned devices that might replicate human cognition in terms of performing human tasks and basic cognitive functions, established the groundwork for neural networks and deep learning. The establishment of this groundwork led to the creation of the first robot that was able to play and win a human game "Tic-tac-toe" in (1961), this development proved the theory of AI and the manifested the possibility of creating intelligent machine that think and act like human beings in real life application. After this scientific millstone, different robots were

developed to perform different human functions and cognitive tasks, including Eliza that was a language processing system that imitates human's speech in natural conversations, Shakey that was the first robot capable of both language processing, cognitive reasoning and physical mobility as well, in addition to their AI robots that fulfilled the vision of intelligent machines.

Therefore, this period witnessed a major enthusiasm in the field of science and technology. However, Sharma, et al (2024) described in their article that the following period (1980s) witnessed a significant setback and decline of AI advancement due to several factors, this period was even described as AI winter as a reference for the challenges that this phase encountered after its thriving start. These factors include the high and unrealistic expectations of scientists, and lack of funding from investors that was caused by skepticism towards the potential of this field in delivering the high expectations that were set for it to achieve (Sharma, et al, 2024). However, this period did not last long and AI technology resumed its progress with the start of the 1990s. Rai (2024) reported that AI blooming in this era is associated with the proliferation of social media, explaining that AI became more integrated with disciplines like economics and control theory, emphasizing agents for its reliance on data to analyze customers' needs and preferences. This new development covered the limitations of the AI sensory systems like voice and vision recognition that were frequently seen as unreliable, thus, AI became more effective for its reasoning and planning processes that are essential for information management. Consequently, AI tools thrived from the 1990s until current times with new developments and advancements in its features everyday. This technology became used in every life facet, including education.

1.1.3. Popular AI Tools

Several AI tools have proven their effectiveness and gained widespread popularity across various fields and domains. Given the growing number and diversity of AI tools available

today, it is not possible to cover all of them in details. Therefore, this section highlights only a selected group of the most relevant and widely used tools within the scope of this research.

1.1.3.1. ChatGPT

One of the most popular AI tools that proved its effectiveness in the field of research, among other fields, is ChatGPT. According to Sakib (2023), ChatGPT is an interactive language model that was created by AI, it produces human-like language by using a Transformer architecture and an abundance of text data for training. Thus, it is an AI robot that is designed for generating ideas and answers based on data collected from different resources on the internet which also produces speech like the one produced by human beings. Sakib (2023) also explained that ChatGPT (Generative Pre-trained Transformer) is ideally suited for conversational applications like chatbots, virtual assistants, and customer support representatives because it is made to produce text in response to an input prompt. The model can produce language that is coherent, contextually relevant, and frequently similar to text written by humans because it has been trained on a wide variety of conversational data, such as books, websites, and social media. Therefore, it is explained that ChatGPT can answer any question that users type and often provide reliable information that are derived from existing books and articles. In other words, this chatbot could be seen as valuable source of knowledge and information in different life fields and domains which could be derived with a click of mouse. This could be stated as one of the main reasons for using this tool in research, which is to find academic resources that helps researchers in their work.

1.1.3.2. Perplexity

Moreover, Perplexity AI is another tool that made its way into the field of academic and scientific research. According to Nelson (2023), a group of prominent figures from OpenAI, Meta, Quora, and Databrick introduced Perplexity AI in August 2022 with the main goal to

overthrow ChatGPT and outcome its performance. This group of AI experts, led by Aravind Srinivas, Denis Yarats, Johnny Ho, and Andy Konwinski, provided a powerful chatbot experience which enabled them to design a Chabot that not only provides responses to the questions and prompts asked by the users, but also offers links to relevant sources and information. Compared to ChatGPT, it is a significant feature that enables the users to verify the source of the information provided by this Chatbot and cite the reference in their articles for credibility and avoiding academic dishonesty, which is a significant factor in academic research.

Moreover, this AI Chatbot understands the user's purpose and provides clear information and useful suggestions by utilizing machine learning and natural language processing (NLP)(Nelson, 2023, as cited in Drought, 2024). Thus, it provides automated customized information that are based on students or users' exact needs and objectives. It uses natural language processing system to achieve this aim. Therefore, it could be concluded that this AI tool could also be used in the field of research because its provides researchers with direct and straightforward information about the topic they need. This feature could save both time and effort and boost the research process by making the data collection and information searching more focused, efficient and accurate as well. In fact, there are other AI tools that are used in research and proved both their effectiveness and efficiency. However, this chapter cannot cover all of theme, therefore, ChatGPT and Perplexity AI are taken as examples to represent AI in general and show its use in research.

1.1.3.3. QuillBot

QuillBot is one of the most popular AI tools that are known for their uses in writing. According to Latifah, et al (2024), QuillBot is a sophisticated writing assistant driven by AI that helps users produce accurate, well-structured, and cohesive material in writing. Therefore, this tool serves as a digital tool that is used to help EFL learners refine and correct their

language structure and form in their writing. El-Garawany (2024) further explained that EFL students are encouraged to critically assess their work and make adjustments based on their awareness of linguistic standards thanks to QuillBot's rewrite choices, which provide immediate feedback and ideas for improvement. This shows that the main services of this application (app) is to provide immediate feedback to students' writing that corrects and improves their performance. Moreover, the app also provides suggestions for students that they can use to correct their mistakes. In addition, this app offers summarizing and paraphrasing options that students can use as well in their process of academic writing.

1.1.3.4. Grammarly

Grammarly is another popular AI tool that is also used in academic writing. According to Perdana, et al (2021), Grammarly is an AI tool that helps students in their writing by detecting different types of grammatical or linguistic mistakes or errors, it also offers free plagiarism checks which can identify plagiarized paragraphs or chunks in the written texts. Therefore, this app helps students in their writing process through correcting their language structure and form, detecting plagiarized paragraphs or sentences and offering suggestions for linguistic and grammatical improvements in writing.

1.1.3.5. Research Rabbit

Research Rabbit is a less common AI tool in the field of language learning and research. According to Sharma, et al (2022), Research Rabbit is a platform that simplifies the exchange of resources with peers, generates notifications for newly published papers, and allows the finding and visualization of pertinent literature and experts. This definition shows that Research Rabbit is designed for researchers and scientists who are involved in the field of academic research. It enables them to find academic articles and published papers, as it also facilitates the process of sharing resources with fellow researchers and scientists as well.

1.1.4. Using Artificial Intelligence in Education

In fact, there is debate about the fact that AI has taken center stage in the field of global education and gained acceptance in academic settings. A great evidence of the success of AI tools in the field of education is its integration by the most successful leading universities around the world. A list of these universities was provided by Nelson (2023) in his article, they include Massachusetts Institute of Technology (MIT), USA, Stanford University, USA, University of California, USA, University of Oxford, UK, University of Cambridge, UK, Harvard university, USA, University of Toronto, Canada. This list presents some of the leading universities of the world which are recognized with their excellence in the field of education and scientific research in the USA, the UK and Canada. Their adoption of AI tools for the purpose of enhancing the learning process is a clear sign of the legitimacy of these tools and their potential to significantly alter the field of education.

More importantly, the use of AI in other global schools and academic settings is predicted to be an obligatory procedure to accommodate the world's development in the upcoming years. This could seem as an unpredicted or an unlikely possibility in the developing countries, but it is a strong probability in more advanced regions across the world where there is a growing emphasis on AI use not only in education, but in different life domains. According to Karsenti (2019), schools may be forced to create room for new types of technology, such as AI, as they become more and more prevalent in humans' daily life and attract the young generation (as cited in Gocen & Aydemir, 2020). Thus, educators and curricula designers cannot prevent AI tools from penetrating the educational setting since it is used in every other aspect of students' life outside the classroom.

Japan presents another successful example of the integration of AI in education through which a private university in Tokyo adopted the use of AI tools as part of its curricula with its third-year business majors. Obari and Lambacher (2019) reported that the AI tools used in this

university included Google Home Mini, Amazon Alexa, ATR CALL Brix. Those tools were mainly selected for the aim of improving students' English speaking skill. Considering that the students are Japanese native speakers, they needed a model for authentic language exposure. The implementation of AI tools contributed to the improvement of the students' general English language learning experience. It was revealed that using the AI smart speakers Alexa and Google Home Mini in conjunction with language learning exercises that emphasized a social constructivist approach enhanced the students' communication and listening skills. These results highlight the significance of AI in language education and the acknowledgement of international universities of this significance through admitting these tools to be implemented in their language teaching curricula.

1.1.4.1. The Use of AI in Language Education

The field of Academic Research has witnessed a radical shift and transition over the last few decades. The development of the world's technology and the advancement of science has led to the emergence of AI and its integration into people's daily life. Moreover, the reliance on AI extended to the daily life domains and penetrated the sphere. In fact, education has been so submerged in the use of AI that no one can deny the significance of integrating computer sciences and AI tools into education nowadays. It is an integration that made it easier for teachers to convey knowledge and for their students to receive it (Raja & Nagasubramani, 2018). Consequently, AI is currently viewed or considered as one of the most popular language learning tools in the field of Second Language Acquisition (SLA).

1.1.4.2. Advantages of Using of AI in Language Education

The use of AI in language learning and teaching is a common occurrence among EFL students and teachers nowadays. C ndor-Herrer, et al (2022) provided some promising results through their research about the use of digital assistants in language learning as an example of

this extensive use. They reported that these AI systems provide learners with human-like interaction through imitating native speakers' pronunciation of the target language, which makes learners have an authentic language interaction with a native speaker of the language in a natural way. This proved to help learners significantly increase their language proficiency and improve their speaking and communication skills. A case of a Russian students learning English through one of these AI assistants "Alice" was presented as evidence of the effectiveness of these tools in promoting language acquisition, this student was able to improve his speech and promote his communicative competence through practicing speaking with Alice (Córdor-Herrer, 2022). Therefore, AI shows to have the ability to transform the EFL learning process and removing its challenges for EFL learners through providing students with native-like speech practice with the scroll of a screen. More importantly, these results call for the necessity of integrating AI tools in EFL teaching and making them an integral part of language teaching pedagogy.

Moreover, it is believed that AI could significantly contribute to the improvement of current language learning experiences in terms of enhancing students' engagement in the learning process, making their learning more individualized or personalized, and increasing the efficiency of their language learning courses (Harry, 2023). It is not only believed, but confirmed that:" The areas employing the technology of artificial intelligence have seen an increase in the quality and efficiency" (Verma, 2018. p. 5). These statements reveal the positive role of using AI in providing learners with more customized learning experiences that meet their needs and preferences, enhancing their participation through the use of digital materials that attract their attention, and fulfilling their objectives in improving their language skills in a short period of time compared to traditional language learning.

Furthermore, AI tools showed to have a positive role in promoting EFL students' overall language proficiency. Research shows that AI helps students develop their listening and reading

skills through providing them with the opportunity to understand language input and produce their own language output in an effective and monitored way (Sahem, 2024). This means that AI does not only help learners understand language input through listening and reading texts, but it also provides constructive feedback that corrects students' production mistakes and improves their performance. Alsaif (2024) further added that AI in language acquisition has the ability to increase student autonomy by giving them access to a plethora of materials and enabling them to receive feedback at any time and from any location. This means that the emergence of AI in the field of education provided learners with an alternative guide for their learning process other than their teacher. This way, they can continue their learning process outside the classroom and rely on AI tools in providing them with both language input and monitoring their performance as well, which further confirms the positive role of this technology in providing feedback for EFL learners that is essential for the consistent and proper development of their language skills.

1.1.4.3. Disadvantages of Using of AI in Language Education

Despite its benefits, AI is also known to have several drawbacks that hinder its implementation in the field of language learning. Ortiz. et al, (2025) revealed through their study that although AI is widely used in teaching and learning practices, there is a strong negative correlation between AI and teaching methods, which suggests that teachers using AI may find it difficult to effectively adapt their instructional strategies. Consequently, this could also affect how well teachers assess their students' performance. Thus, it could be argued that instructors may have numerous difficulties while using AI into their lesson plans and incorporating its tools into their hands-on teaching sessions. This may be the reason for their hesitation and opposition to incorporating AI into their teaching methods, opting instead to use the safe traditional approaches.

There are other factors that stand in the way of accepting AI by teachers and educators. They include the lack of training and expertise from their parts, limited internet access and lack of materials, lack of motivation and confidence to use AI, ethical and safety concerns, and lack of human interaction (Bechabe & Perido, 2024). These concerns reveal some of the hesitation that teachers face in fully adopting AI in their teaching methods and their reserved attitude towards this technology. In fact, it could be stated that lack of technical support could be a vital factor in the failure of AI integration in any educational setting. Cîmpineanu (2024) also added that AI implementation is expensive and requires high maintenance. Therefore, it is often challenging to integrate this technology and its tools in educational institutions, especially public establishments. Lack of confidence in these tools also play a role in making teachers hesitate to integrate AI tools in the EFL learning process because students can use these tools for cheating instead of developing their language skills.

In addition to false information and misleading reasoning, AI showed to have a negative impact on students' critical thinking through the over-reliance on this technology in their EFL learning process, which influences their creativity and turns their language learning into a superficial and shallow process (Kerma, 2025). This means that relying on AI tools to conduct assignments, generate ideas, make projects could lead students to isolate themselves from their learning process and refrain from making any cognitive effort to engage in tasks and challenge themselves in finding solutions to their real-life situations. Thus, they become heavily reliant on this technology and learn to neglect their critical thinking and reasoning skills. Similarly, Cela. et al, (2024) addressed through their study, that despite the benefits of AI tools, their proper use is not highly discussed enough or demonstrated sufficiently for learners to use it accurately for the aim of promoting their learning, instead of causing a detrimental effect on their critical thinking and preventing its development. Therefore, Cela. et al, (2024) illustrated that it is teachers or policy makers' responsibility to properly guide students into the correct

use of AI tools and showing them how to use this technology to enhance their learning process, instead of using these tools to do the learning process on their behalf.

Moreover, in another study conducted to examine the effects of using AI on students' critical thinking skills, Zhai. et al, (2024) revealed that critical thinking is related to students' ability to analyze their learning process context and make conscious decisions to solve arising problems and create innovative learning strategies for the aim of promoting their learning experiences and outcomes. However, they also showed that there is a risk that people may become overly dependent on AI for decision-making because AI systems are capable of handling large amounts of data and producing precise estimates. Consequently, both teachers and students may become less creative and innovative in their learning and teaching approach as a result of this over-reliance, which could lower the standard of education and reduce critical thinking for both students and teachers alike.

In addition, another pedagogical issue that has been associated with the use of AI students' profiling. This process, according to Chanda, et al (2024), entails the act of evaluating a student's competence based on his performance and engagement in the learning process. This often shows through teachers' categorization of their students without even a test or an exam to have a concrete evidence on their level. However, the use of AI makes this process of evaluating students somehow challenging for teachers. Using AI technologies, such as ChatGPT to complete schoolwork could result in students receiving credit for betraying their teachers' confidence and misleading them by submitting a plagiarized piece of work that was not created by them. Kelly (2023) agreed that many instructors are concerned that students would use it to cheat because AI can generate answers complex enough to pass tests in both law school and business school (as cited in Clark & Kessel, 2024). Therefore, academic dishonesty is a serious issue that results from the use of AI in education that leads teachers to create false files of their own students.

Section Two: Academic Research

The term “research” could be familiar to the majority of people, however, it is not clearly defined in terms of its features and characteristics. Therefore, the present section highlights the meaning of research and the main features that characterize this field.

1.2.1. Definition of Research

Research is a common word that is often used in academic and scientific research. Kabir (2016) demonstrated that the term literally indicates going back and looking for something again, which implies that the initial search was not thorough and full and that there is still room for development. Therefore, it could be stated that research entails the process of looking for new information over and over again for the aim of improving the current state of knowledge and adding more new information to a particular topic of investigation. In the more inclusive sense of the term, research is defined as a scientific method that aims to provide an answer to a research question, resolve an issue, or create new knowledge by the methodical and orderly gathering, organizing, and analyzing of data with the ultimate objective of helping decision-makers use the research (Kabir, 2016). This term highlights the nature of research in terms of being a methodological and systematic approach to examining a phenomenon through the collection and analyzing of data. This process often concludes with findings a solution to a research problem, or confirm/deny a n already existing hypothesis.

Similarly, Naidoo (2011) added that research in science is the methodical, thorough investigation of nature and society to produce new information and to validate and improve what is already known. This shows that research could be conducted to explore new information or phenomenon in nature or social sciences that has never been discovered before, or to simply add new aspects about something that has been already discovered before. This

description highlights the two main aims of research, which is establishing new facts or adding new information to an already existing result.

1.2.2. How to Conduct Research

As demonstrated, research was identified as a methodological process of looking for information. This implies that there are certain steps and procedures that should be followed in order to conduct a research. Accordingly, Singh (2021) confirmed that the research process is made up of a number of steps or actions necessary for successfully conducting research, including formulating the research problem, conducting a thorough literature review, developing a hypothesis, preparing the research design, choosing the sample design, gathering data, analyzing the data, testing the hypothesis, generalizing and interpreting the results, and writing the report or presenting the findings. Based on this outline, it could be concluded that research has a number of established steps that need to be followed. These steps include the formulation of the research problem, reading about the previous studies that were conducted in the field, hypothesizing a research answer that could provide solutions for the research questions, selecting the research paradigm that is suitable to approach the research topic (selecting the design, methods, population, sample, data collection and sampling techniques), conducting the research, collecting and analyzing data, then testing the hypothesis (to be confirmed to rejected) based on the research findings. The final two steps could be optional in terms of conducting a research report and performing an academic presentation. Moreover, it should be noted that the process of research is all based on the aspect of the research problem, upon which the research designs a study, in an attempt to find a solution to this problem in a methodological way.

Similarly, Akhtar (2016) explained that any researcher should create an action plan, which is the framework for data collection, measurement, and analysis. Based on this definition, it could be stated that research design encompasses the plan of action that determines

the course of the study and the tools that are used to collect, interpret and organize the data. It could be also comprehended that there are particular types of research design that researchers could use in order to organize their investigation process and plan for its execution.

In fact, it should be noted that there are different types of research design, they include descriptive, case study, experimental, and exploratory research. Each of these types is used differently based on the aim of each study and the desired outcomes that the researchers seek to achieve. The most two frequently used designs in research are the experimental and exploratory research design. The first one is one of the most basic research designs in the history of research, it is based on the concept of testing a phenomenon in effect of environmental changes, also called treatments, in order to draw conclusive results that could be generalized as facts (Roos & Morrison, 2003). Since experimental research employs a systematic, scientific methodology to address the study topic, its design is irreversible and straightforward. Therefore, it yields more accurate results than the other types of the research design.

Exploratory research on the other hand, is defined as the process of looking into and learning about an unfamiliar area in order to create broad knowledge and provide background information about a specific subject or object (Stebbins, 2001). Therefore, the purpose of exploratory research is to study a research subject that has not been thoroughly studied before and has a limited body of literature to provide foundational knowledge upon which future researchers might base their studies. In order to investigate human phenomena and shed light on the complexity of human mind, perception, and behavior, this type is mostly employed in the human sciences (Stebbins, 2001). Consequently, it could be stated that this type of research design is often adopted when the researcher aims to explore human perceptions and insights of a particular topic and provide background information to enrich existing literature.

1.2.2.1. Data Collection Means

In terms of data collection and analysis, the data collection process is the phase in which the researchers gather information from their sample of the study using different research tools and instruments. According to P. Pandey and M. Pandey (2015), these tools are defined as the instruments that the researchers use to collect, evaluate and interpret the information provided by the participants of the study. In fact, there are different tools that are used in research to fulfill this purpose, each one is used based on the type of data that are to be collected and the aim of each data collection phase.

1.2.2.1.1. Surveys or Questionnaires

The questionnaire could be described as a highly common tool of data collection that is normally used in quantitative research. This tool is defined as the set of questions that are designed for people to answer in order to gather statistically significant data on a certain subject (Roopa & Satya, 2012). This tool allows the researchers to gather statistical data about their topic and reach an accurate result in their research.

1.2.2.1.2. Interviews

The interview is another common used data collection instrument. But unlike the questionnaire, this tool is qualitative and often used in qualitative research methods. According to Mathers, et al (2000), the interview is an essential tool of collecting data that involves verbal exchanges between the subject and the researcher, it is often used in exploratory and descriptive research. Therefore, this tool is used to obtain elaborated and qualitative data from the participants concerning their opinion, insights or attitudes towards a particular subject. Thus, this tool provides in-depth comprehension of a particular phenomenon instead of accurate statistics.

1.2.2.1.3. Observations

The observation is another qualitative data collection tool that is often used in research. According to Sahani (2013), observation is the process of gathering information about a particular topic of research by seeing people, locations, and events up close. Thus, it entails observing and watching people to examine their interaction with a particular research topic or phenomenon. This tool allows the researcher to obtain real information in real life situations about their topic. Moreover, it is added that there are two primary forms of observation: unstructured observation, which is more fluid and open, and structured observation, which adheres to a set plan and schedule (Sahani, 2013). Thus, the structured observation follows a pre-set checklist through which the research examines the environment he selects for the existence of specific conditions or factors. The second type on the other hand is more natural, where the researcher observes his selected environments and notes the factors surrounding him.

1.2.2.1.4. Experiments

The experiment could be described as the basis of the scientific experimental research design. According to Baseeji (n.d.), an experiment is a process created to test a hypothesis, it is part of the scientific method that provides a systematic approach to investigating the world around the researcher. Therefore, it could be stated that the experiment is the process of creating a systematic experimental procedure in an artificial environment that is monitored by the researcher to test a certain hypothesis and establish new facts.

1.2.2.1.5. Documents or Record Analysis

Document analysis is another qualitative tool that is used in research. According to Bowen (2009), this tool refers to the methodical process of assessing both printed and electronic (computer-based and Internet-transmitted) materials, this tool necessitates the examination of data, just like other analytical techniques in qualitative research.

Moreover, the final stage of the research procedure encompasses the process of analyzing and interpreting the data collected from the participants to reach the final conclusion. According to Ibrahim (2015), data analysis is the process of carrying out specific calculations and assessments to draw relevant information from the data gathered. In order to perform this task, different tools and instruments could be used.

1.2.3. Research Approaches

Research approach presents the techniques that a researcher or researchers use to address a research question, these tactics may use participant observation, questionnaires, surveys, and historical record analysis, among other things (Pediaa, 2015). In other words, the term research approach refers to the set of tools and strategies that the researchers use to collect, organize, analyze and interpret the data required to answer the research questions that were posed at the beginning of the study. This term could be often confused with the term “methodology”. However, it should be kept in mind that methodology includes all the procedures, tools, techniques and approaches used to examine a topic of investigation, including the population, the paradigm, the setting and others, whereas the approach is only concerned with the process of data collection and analysis. In fact, there are three types of research approaches that are listed in literature. They determine the strategies that researchers use to approach their data collection and analysis procedures. They include quantitative, qualitative and mixed methods approach (Akhtar, 2016).

1.2.3.1. Quantitative Approach

Sharma (2018) identified this type of research method as the process that relies on the collection of numerical data from the participants and transforming it into statistics. It could be stated that this research method is primarily applied to scientific fields where the primary goal is to achieve accuracy and precision in the outcomes. The information acquired using this

technique is typically shown as numerical figures and statistics that accurately quantify the outcomes and results of the study. Thus, it could be also stated that this method is used as the main research approach in a particular study when its aim is to achieve accuracy and precision.

Similarly, Akhtar (2016) also recognized the quantitative approach for being exact and accurate and is supported by statistical data and figures, and it is often used when the study aims at emphasizing quantity rather than quality. Therefore, the use of this approach in research means that the researcher wants to have accurate results about his research topic.

1.2.3.2. Qualitative Approach

Furthermore, Sharma (2018) also described or defined the qualitative research approach as an observational technique that extracts knowledge and comprehension from non-numerical data. This approach's primary information source is qualitative data, such as conversations and informal interviews, which are then evaluated to provide details on a specific research topic. Thus, it could be stated that this approach could be mostly used in human sciences when quality is emphasized over quantity because the aim is to obtain knowledge and provide information with detail instead of just presenting numerical statistics.

Similarly, Akhtar (2016) added that this type of approach is concerned with the quality of the data collected rather than the quantity, it involves the description of a phenomenon taking into consideration participants' insights and perceptions as the main source of data. Thus, it could be observed that each of these two approaches focus on a specific aspect, the first one is used when accuracy is sought, whereas the second one is used when exploring insights and opinions is aimed for promoting comprehension.

1.2.3.3. Mixed-Methods Approach

Consequently, the third type of research approaches is used when a study is targeting both accuracy and comprehension at the same time. This type is called the mixed-methods

approach. According to El-Hafsa (2019), this approach involves the process of combining or integrating data and research from both qualitative and quantitative methods into a single study for the aim of having the benefits of both research methods and maximizing their outcomes.

It has been seen through the two previously listed methods, that each one is used to achieve a particular feature or aim that characterize the topic of research. However, there are researchers who seek both accuracy and comprehension in their study, and cannot use either methods separately. Hence, they opt for the mixed-methods approach that combines both quantitative and qualitative research methods in a single study. Sharma (2018) claims that a mixed methods approach incorporates both qualitative and quantitative data collection techniques, producing superior study outcomes than either could produce on its own. When both approaches are applied to a single study, the results are accurate and precise, and a thorough understanding of the research issue is produced.

1.2.4. Research Characteristics

The characteristics of research may differ from one researcher to another or from one research to another. However, there are recognized elements that are consistent in research and considered as standards in this field. Miaga (2023) for instance, stated that research should be systematic, objective, feasible, and empirical.

1.2.4.1. Systematic Outline

Research should follow a systematic outline that determines the interrelated procedures and steps involved in conducting research.

1.2.4.2. Objectivity

The researcher should remain objective and choose a neutral position, preventing personal opinions from influencing the findings.

1.2.4.3. Feasibility

Research should be feasible, meaning the procedures outlined should be practical, and the researcher should have the ability to afford and access the required population or information for the investigation.

1.2.4.4. Based on Experience, Observation, or Experiment

Research should be based on experience, observation, or experimentation, ensuring the findings are valid and credible.

1.2.4.5. Validity

The research should be valid, allowing the findings to be acknowledged and even generalized.

1.2.4.6. Concrete Evidence

Research should not represent hypothetical scenarios proposed by researchers without concrete evidence to support the claims.

In another classification provided by Naido (2011), there were other characteristics listed, including relevance, conceptions of research, orthodoxies, theoretical orientations and ethical framework. This shows that the characteristics provided in this study are different from the ones listed earlier. Naido (2011) explained that contextual relevance and content must be the foundation of research, thus, research procedures should be relevant to the topic under investigation. Moreover, conceptions entail that research is usually carried out with specific objectives in mind, such formulating a theory, suggesting solutions, influencing laws or policies, or just recording a phenomenon (Naido, 2011). Therefore, it is recommended that researchers form an initial conception of their research outcome. In terms of orthodoxies, this aspect concerns the research design that corresponds with the level and objective of the research conducted, meaning that postgraduate research should not follow the simple and basic research design that is adopted in undergraduate studies. In addition, the characteristic of

theoretical orientations demonstrates the theoretical boundaries that narrow down the research area and maintain its focused scope, while the ethical framework highlights the moral and ethical considerations of the participants' privacy and autonomy in participating in the study. Therefore, it could be observed that the characteristics of research demonstrate the standards that should be followed by researchers to conduct their research and outline the ethical and theoretical boundaries of studies conducted.

1.2.5. Use of AI in Research

As it has been demonstrated, AI has been discovered and evolved through scientific research. Therefore, the use of AI to advance the field of research is not only logical but it may be the most suitable approach to accommodate the world's rapidly evolving environment and its technological advancement. Evidently, Arangüena (2024) demonstrated that AI tools may be used to automate research processes, such as formulating hypotheses and carrying out the actual research, as well as to access vast information databases, address peer-reviewing concerns, search published material, identify plagiarism, and verify data. All these features that AI offers to researchers may be considered as boosters that could elevate the quality of conducted research and increase its outcomes. The use of AI can provide researchers with an unlimited access to information online in a short period of time that could save them years of searching, and effort as well. Moreover, AI tools, with their human-like intelligence can carry out the entire process of conducting research without the traditional human limitations, such as bias, plagiarism and lack of funding, which can also improve the quality of research and promote its results. As a result, it could be stated that AI has the potential to drastically alter the field of scientific research by introducing systematic benefits that could advance this field and promote its course.

1.2.6. Benefits of Artificial Intelligence in Data Collection and Analysis

The field of scientific research is vital for the advancement of knowledge in different fields of life and the comprehension of already existing but undiscovered phenomenon. This process of generating knowledge and discovering new information is characterized with three important phases; they include the synthesis, the analysis and the fact establishment phase (Silva, 2022). The first phase includes the problem upon which the research is built and the questions raised by researchers who conduct studies to find answers to these questions. The second phase includes data collection and analysis that enables the researchers to gather information about a particular phenomenon or a problem, while the third phase entails relating the newly found information with already existing knowledge. Therefore, it could be stated that data collection and analysis are the foundation upon which is research is build and concluded. Thus, the use of AI to facilitate and support this phase could be beneficial for the whole research process.

1.2.6.1. Benefits of Artificial Intelligence in Data Collection

The use of AI in research has key benefits that makes it more efficient and effective than traditional research. Some of these key benefits in the data collection process are presented as follows:

1.2.6.1.1. Enhancing Speed and Efficiency

In fact, saving time is one of the most acknowledged benefits of using AI tools in research, or in any other academic or industrial field. Several researchers admitted that AI provides information or conducts assignments in a significantly short period of time compared to humans (Morris & Connolly, 2023). Perplexity AI, for instance, is showed in literature provide a number of natural language processing (NLP) functions, making it a dependable and effective method for finding information rapidly (Priegue, 2023). Thus, instead of reading

numerous articles online or on physical copies, research can directly type what they need on AI chatbots and these tools would automatically generate the information that researchers need, along with the reference to the book or the article from which this information has been taken from. As a result, researchers can save both time and effort that could have been wasted through collecting data the traditional way and use AI in performing this task instead.

In addition to efficiency and time-saving, AI tools are also known to be cost-effective. In other words, they are feasible in terms of saving money and requiring a low to non-existent budget which is a benefit that suits every teacher regardless of his domain and teaching area. In Shabani's study (2024), AI-based tools and methods were described as highly effective with their advanced capabilities and incredibly low-cost. In the case of data collection, it could be stated that using AI is both affordable and efficient at the same time. Considering the fact that funding is a common limitation of scientific research (Okolie, 2023), it is noteworthy that AI has the potential to reduce the costs of conducting research and be more productive in conducting both data collection and data analysis for the researchers (Chubb.et al, 2021).

1.2.6.1.2. Increasing Accessibility to Data

Enhancing accessibility to online information is one of the most acknowledged benefits of using AI tools in the field of research. It is recognized that AI can analyze data more thoroughly and quickly than humans, obtaining a high degree of accuracy and becoming a dependable tool, it can gather and analyze vast volumes of data that could be beyond the scope of human analysis, allowing AI to make suggestions for constructive and effective decisions (Chen, 2023). Therefore, this technology has broadened the scope of data collection and make it possible to access an unlimited amount of information that could be found online in a short amount of time.

In a study conducted by Elbadawi. et al, (2024), AI was examined to investigate its ability to not only gather information about a particular topic, but to also write an original scientific article about a rare topic in pharmaceuticals that describes the process of conducting a full research without human involvement. The proceedings of the study revealed that AI was able to generate a hypothesis, establish an experimental protocol, create photo-realistic photographs of 3D printed tablets, and produce credible analytical data from a variety of instruments. Therefore, this AI model was able to create a compelling publication-ready paper with proof of critical interpretation, showing its ability to not only have access to scarce resources, but to also interpret the data collected through critical thinking and reasoning in a human-like manner.

1.2.6.2. Benefits of Artificial Intelligence in Data Analysis

The use of AI in research has also key benefits in the data analysis process. Some of these benefits are presented as follows:

1.2.6.2.1. Enhancing Speed and Efficiency in Data Analysis

AI plays a crucial role in speeding up data analysis. In many research fields, analyzing large datasets is a time-consuming and complex process. AI tools, especially machine learning algorithms, are able to process and analyze massive datasets more quickly and accurately than humans (Arangüena, 2024). This allows researchers to draw conclusions from complex data much faster, which is particularly beneficial in fields like genomics, social sciences, and economics.

Moreover, AI tools can identify patterns that might be difficult for human researchers to detect. This is particularly useful in studies involving large, unstructured datasets (Kosaraju, 2021). By automating repetitive tasks and running sophisticated analyses, AI significantly

accelerates the data analysis phase, thus allowing researchers to spend more time on interpretation and theory development.

1.2.6.2.2. Reducing Human Bias

Human bias is considered as one of the major limitations of research. In fact, objectivity is one of the most basic requirements of scientific research that ensures the validity and reliability of the research findings (Khatwani & Panhwar, 2020). Thus, the researcher should always try to alienate his point of view and personal involvement in the proceedings of the research, in order to make sure that his perspective did not influence the course or the results of the study. However, it is challenging for humans to maintain their objectivity and voicing their opinions even in an indirect manner. Akpan and Bassey (n.d.) proved that individual biases, prejudices, and judgments are major problems that impede the dependability of the research findings and its results. Therefore, researchers are recommended to constantly check their personal involvement and isolate their subjectivity from their studies.

Consequently, the use of AI has been mostly supported for its ability to eliminate this challenges since it is a machine-based technology and has no emotions or personal opinions to be involved in the research procedure. In a study conducted by Chen (2023) to examine the use of AI in human resources management, it was revealed that this technology has the potential to improve the quality of the recruiting process in major companies by increasing the efficiency of this process and identifying adequate candidates who meet the job descriptions and requirements. Thus, AI tools proved to be neutral in one of the most personal aspects of professional work, which is the involvement in human resources functions, a department where it is quite challenging to be objective and alienate personal judgement for humans.

However, it should be also noted that not all AI tools are bias free. On the contrary, there are some applications that operate based on discriminative algorithms, which have the

potential to generate bias results and information. Min (2023) confirmed that there are AI systems that discriminate against social racial, ethnic and socioeconomic groups, in addition to gender and age. These tools violate human rights and raises the issue of bias in the field of research. As a result, researchers should test the AI tools that are employed in their study before relying on them to carry on the data collection and analysis procedures.

1.2.6.2.3. Providing Automated and Efficient Feedback and Editing Services

Providing automated feedback has been mostly acknowledged as a major benefit of using AI in the field of language learning. Verma (2018) for instance, showed that this technology can be used to perform one of the most exhausting tasks for teachers, which is grading students. He explained that instead of spending hours or days correcting the endless paper exams of university students, teachers could simply rely on AI tools to do this task for them and provide automated and detailed feedback for students on their performance.

Similarly, Amelia (2022) also showed in her study that this AI tool is capable of identifying students' errors in writing, particularly those involving grammar, punctuation, and spelling, as it could also detect plagiarism in their writing product and notify them of the passages where plagiarism is detected in order for them to improve the quality of their work and enhance its authenticity, in addition to also increasing students' vocabulary knowledge and language structure as well. In terms of Quillbot, Mohamed, et al (2024) proved through their study that this AI tool is effective in enhancing students' paraphrasing skill, which is essential for their writing proficiency. This shows that AI could be effectively integrated in language learning and teaching pedagogy because it provides automated, constructive and fast feedback for learners in order to correct their errors and improve their writing skill.

Consequently, this revolutionary technology can be also used in the field of research through correcting and editing researchers' scientific articles. Krishnan and Manickam (2024)

demonstrated that AI systems are equipped with auto-correction algorithms that enable these tools to predict users' spelling mistakes and offer them the suggested corrected versions. This way, researchers can use these tools to facilitate the process of their research writing by editing and refining their texts.

1.2.7. Challenges of Using Artificial Intelligence in Academic Research

Despite the benefits of using AI in promoting the quality of research and improving its outcomes, there are some challenges that hinder its implementation by researchers. Some of these challenges include lack of technology-based equipment, lack of technological knowledge and expertise, academic dishonesty and bias, and poor reliability.

1.2.7.1. Lack of Technology-Based Equipment

Since AI is a technology-based invention, it is only logical that using this approach requires the availability of technological devices and equipment. However, financial funding is a major problem in the field of scientific research (Okolie, 2023). Therefore, it is not always possible to have advanced or even adequate equipment in researchers' disposal. Especially in Algerian academic settings, research shows that university and research facilities lack the technological support that allows the use of advanced AI technologies. Sarno (2020) showed in her study that Algerian public educational institutions fail significantly in technologizing their instructional courses and pedagogical environments. This shows that Algerian academic settings and research facilities cannot even meet the learners' needs in integrating communication and technology tools in their learning process, let alone providing researchers with the technological equipment required for the use of AI in research.

1.2.7.2. Lack of Technological Knowledge and Expertise

Users' training and expertise play a major role in the success of adopting AI tools in the field of scientific research. According to some academics, before implementing AI in any field

of study, users (either teachers, researchers or trainers) must first learn the fundamentals of technology use and, more importantly, effective integration techniques (Alshumaimeri, & Alshememry, 2024). Therefore, AI could be described as useless if it was not properly exploited.

1.2.7.3. Academic Dishonesty and Bias in AI Tools

As already mentioned, AI tools could provide biased and false data and information that affect the quality of research and influence its reliability. Numerous studies have noted that it is possible to identify factual inaccuracies in the data produced by ChatGPT. Examples of these faults include creating faulty responses and fabricating articles that do not exist (Baidoo-Anu & Ansah, 2023; Gordijn & Have, 2023; Qadir, 2022; van Dis et al., 2023, as cited in Sok & Heng, 2023). This shows that the information provided by AI tools are not always accurate and therefore, they cannot be fully trusted to be integrated in or relied on in conducting research, especially in the data collection phase.

Moreover, another challenge that has been addressed through research is bias. Biased AI systems are possible, especially if they were trained on biased data (Harry, 2023, as cited in Cîmpineanu, 2024). In fact, it should be noted that AI operates based on the data inserted that determine the outcome of this technology after it processes the data inserted and analyzes its patterns. Therefore, if the data inserted was based on race bias, or other types of bias, the results of analysis could be biased as well and cause pedagogical bias between ethnic groups and social communities, which could also affect the general results of research. Bender (2022) also criticized that this problem is attributed to the lack of curation of the database inserted in AI. It means that more attention should be paid to the data inserted in AI database and ensure more inclusion of a broader perspective of information that AI could use to process and generate knowledge that could advance the field of research and promote its outcomes.

1.2.8. Ethical Use of AI in Research

As it has been demonstrated, the use of the AI in research could have its drawbacks. These drawbacks could affect the future of research and the quality of findings that result from the integration of AI tools in this process. Helgesson (2024) addressed the point of “mindless research” as a potential outcome in the field of research due to the excessive reliance on AI tools in conducting research. It is indicated that the automation of the data collection and analysis process, which adds more efficiency to the research process, could make researchers overlook their main aims of conducting and start doing it just for the sake of publishing their articles. Therefore, it should be noted that researchers should not be blinded from their main objectives in conducting research with the feasibility of this process after the integration of AI tools in it. However, they should maintain their ethical approach towards the process of conducting research, and always consider it as a way of evolution through exploring the unknown and providing more knowledge about unknown facts and phenomenon.

Conclusion

This chapter concluded that AI is a revolutionary innovation that has the potential to advance the field of research and make it reach unprecedented levels. It revealed that this new technology contributes to increasing research efficiency, reducing its costs, enhancing accessibility and providing constructive and automated feedback. Therefore, it could be stated that the use of AI adds supportive features that could enhance the research quality and promote its outcomes. However, this chapter also showed that there are some limitations that could impact the use of AI in research and cause detrimental effects. They include lack of technological devices and knowledge, and academic dishonesty and bias. Therefore, researchers should pay attention to these challenges when implementing AI tools in conducting research.

Chapter Two

Field Work

Chapter Two: Field Work

Data analysis and Interpretation

Introduction

This chapter outlines the structure of the current study, presenting the methodology employed for both data collection and analysis. It begins with a description of the research population and sample, followed by a detailed account of the means and instruments used. The chapter also explains the method adopted for data gathering and proceeds with a section-by-section breakdown of the questionnaire. Furthermore, it includes the analysis of the collected data and a discussion of the resulting findings. In addition, it highlights the main results obtained and addresses the research questions through statistical evaluation. Finally, it presents a set of recommendations and proposed solutions.

2.1.1. Methodology

2.1.1.1. Sample of the study

The population of the present study consists of Master II EFL students. The sample comprises forty-five students. The researchers employed proportional random sampling. These participants will be asked to explore the ways in which integration Artificial Intelligence into academic research contributes to improving learners' research efficiency.

2.1.1.2. Research Approach

This research will be carried out using a quantitative approach, as it aims to examine the impact, challenges, and ethical considerations of integrating AI into academic research by collecting and analyzing numerical data from student responses.

2.1.1.3. Research Tools

In the current study, the researchers employed one primary research tool: a handmade questionnaire, which was administered to Master II English students. This questionnaire

comprises fifteen questions specifically designed for Master II English learners. Accordingly, it was completed by a sample of forty-five (45) Master II English language students at Mila University.

The Students' Questionnaire is divided into four sections. Section One addresses general information and includes three questions aimed at gathering background details about the participants. Section Two focuses on students' attitudes toward the integration of AI applications in research. This section includes six questions intended to explore their perceptions and viewpoints on using AI tools.

Section Three investigates students' experiences with implementing AI in their academic research. It comprises five questions designed to understand how students apply AI, how often they do so, and the challenges they encounter during the research process. Section Four centers on students' recommendations and suggestions regarding the use of AI and includes four questions.

2.1.1.4. Analysis of Students' Questionnaire

Section one: General Information

1. How do you evaluate yourself in English?

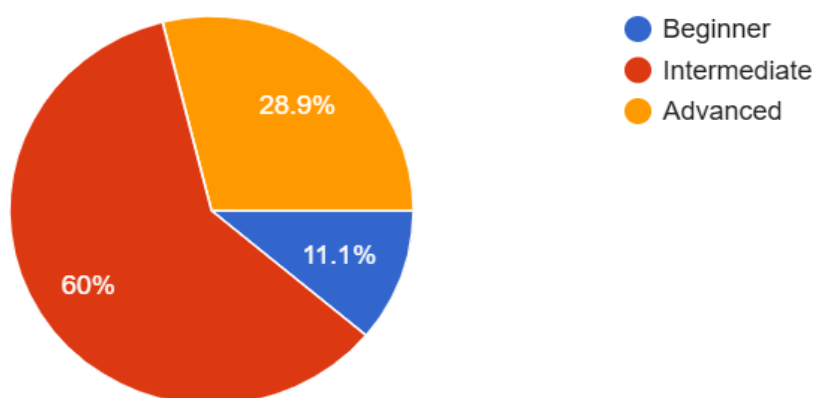


Figure 2: Participants' Level in English

The aim of this question is to identify participants' level of English proficiency in order to assess their ability to provide relevant information concerning the use of AI in their learning process. The data shows that most participants have an "intermediate" level of English with a percentage of (60%). They are followed by (28.9%) of the participants who described their level as "Advanced", while the remaining (11.1%) described it as "Beginner". These findings suggest that students, based on their language proficiency level, have previous experiences in using AI tools in their language learning process for the aim of improving their language skills.

2. Do you use AI based tools or applications to improve your level in English?

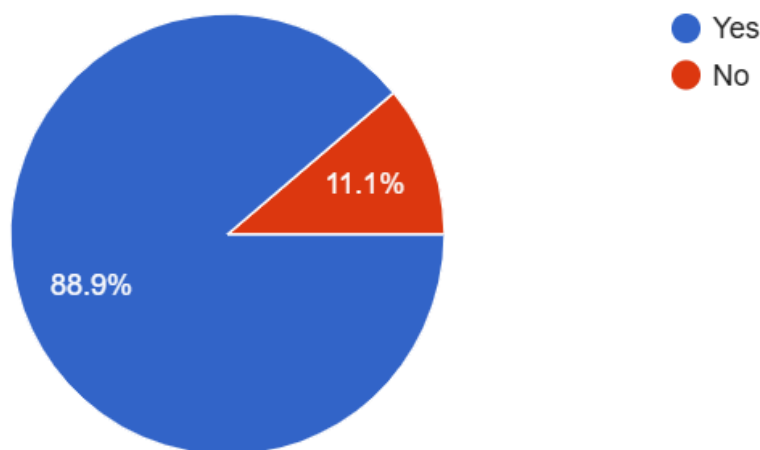


Figure 3: Participants' Use of AI Tools to Improve their Level in English

This question aims at exploring participants' use of AI tools and applications in their language learning process to develop their language skills. It is indicated that the majority of participants answered "Yes" with a percentage of (88.9%), indicating their use of AI in their learning process. They are followed by (11.1%) of the participants who answered "No", indicating their lack of experience in using this technology in their learning process. These findings correspond with the previous interpretation, demonstrating that the sample selected

for the data collection is mostly to provide information concerning their use of AI in their language learning based on their own actual experiences.

3. How would you rate your level of proficiency in operating AI applications?

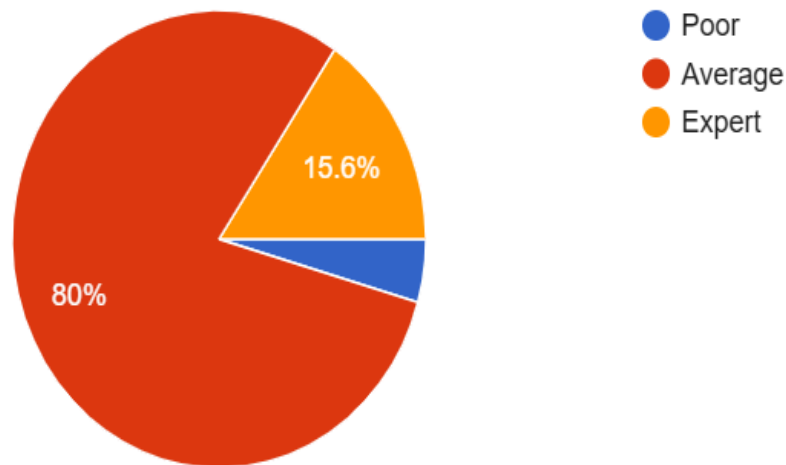


Figure 4: Participants' Level of Proficiency in Operating AI Tools

This question aims at exploring participants' level of proficiency in operating AI tools in order to examine if they have challenges in this regard or not. The data collected shows that most participants describe their level as "Average" (80%), indicating that they can do basic tasks using these apps. They are followed by other participants who described their level as "Expert" (15.6%), and few others who described it as "Poor" with a percentage of (4.4%).

Section Two: Students Attitudes Towards Implementing AI Applications in Research

1. Do you think AI applications help students conduct research more efficiently?

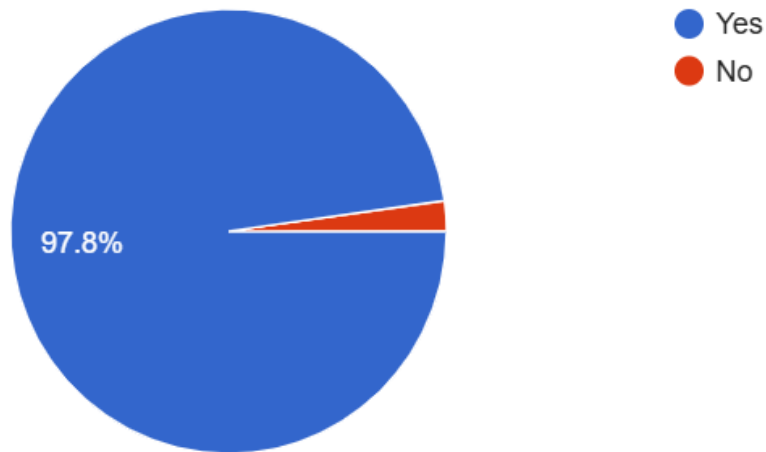


Figure 5: Role of AI Applications in Increasing Research Efficiency

This question aims at exploring participants' perceptions towards the role of AI tools in helping students conduct research more efficiently. The data presented reveals that the majority of participants think that AI applications help students conduct research more efficiently with a high percentage of (97.8%). They are followed by few participants who indicated that these tools cannot help students make research more efficiently with a percentage of (2.2%). These findings confirm the positive role of AI tools in increasing research efficiency.

2. Do you believe AI tools should be integrated into academic research practices?

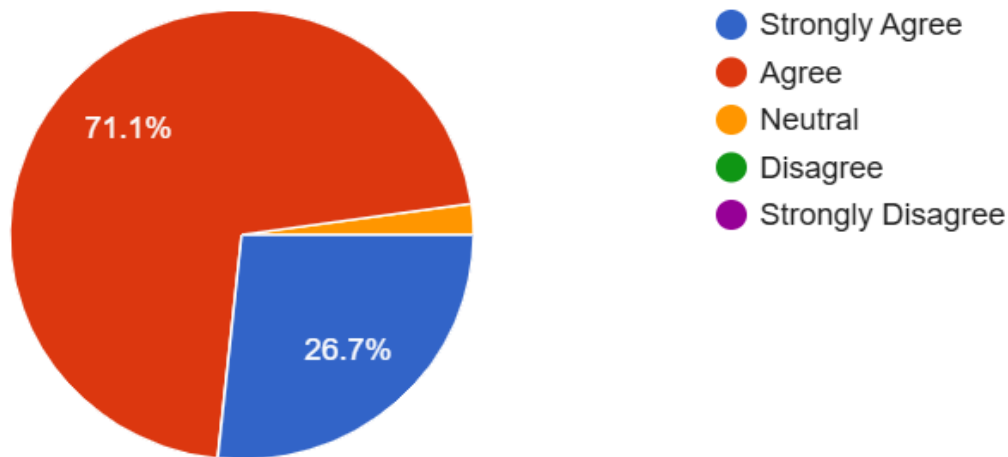


Figure 6: Participants' Perceptions towards Integrating AI Tools in Academic Research Practices

This question highlights participants' agreement with the aspect of integrating AI tools into academic research practices. The data shows that the majority of participants "Agree" and "Strongly Agree" that AI tools should be integrated into academic research practices, with a percentage of (71.1%) and (26.7%) respectively. There are few remaining participants who chose to stay "Neutral" towards the statement with a percentage of (2.2%), indicating their uncertainty towards this aspect and their hesitation to implement AI in official academic settings. These results suggest that most students recognize the potential benefits of AI tools in enhancing research efficiency. Integrating AI into academic work can help students by streamlining data analysis, providing quick access to scholarly sources, assisting in writing and proofreading, and improving overall productivity. This strong agreement reflects a growing awareness among students of how AI can support and enrich their research experience.

3. Do you feel confident using AI in your academic research works?

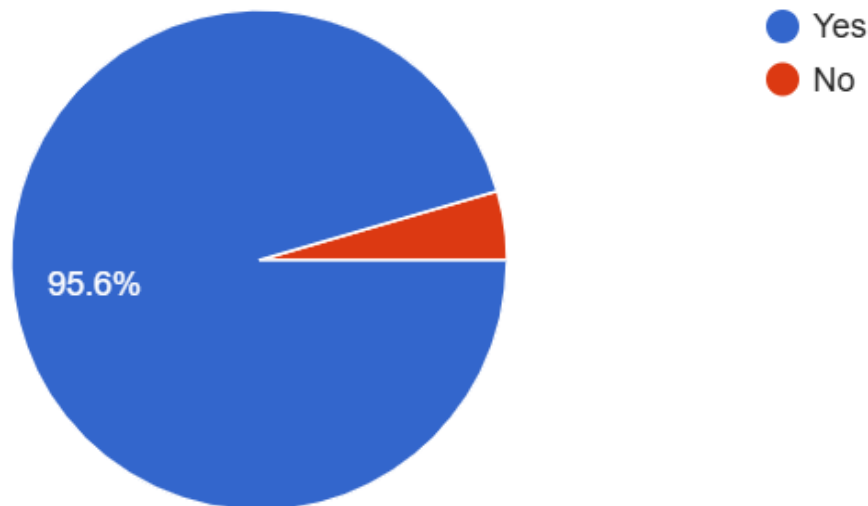


Figure 7: Participants' Confidence in Using AI Tools in their Academic Research

This question aims at exploring students' feelings of comfort when using AI tools in conducting their academic research. It is illustrated that the majority of participants feel confident using AI in their academic research works with a percentage of (95.56%), emphasizing their positive perceptions towards using this technology in their fields. The remaining participants on the other hand expressed the opposite, indicating that they do not feel comfortable using AI in their academic research with a percentage of (4.4%). The results suggest that students are generally open to and supportive of using AI in academic research, viewing it as a helpful and reliable resource.

4. Do you trust the accuracy of information generated by AI applications?

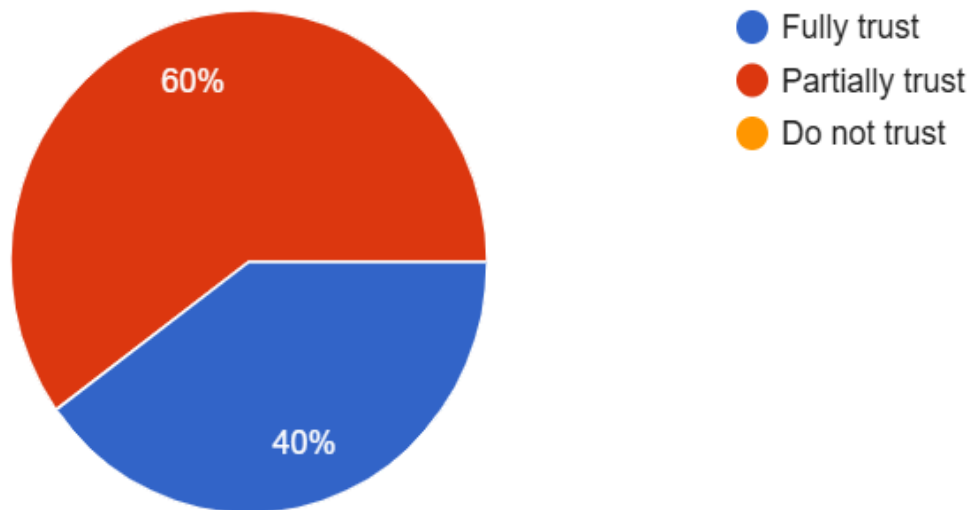


Figure 8: Participants' Perceptions towards the Accuracy of AI-Generated Information

This question aims at assessing the level of accuracy of the information generated by AI tools. The data shows that most participants “Partially trust” the information generated by AI tools with a percentage of (60%). They are followed by (40%) of the participants who expressed that they “Fully trust” the accuracy of these tools in generating information. These findings suggest that AI tools do not always generate accurate information that could help students in conducting their academic research. These findings indicate that while AI tools may not always produce fully accurate information, they remain a valuable resource for students when used critically and responsibly. Therefore, although a degree of caution is necessary, these tools can still significantly support students in conducting academic research when their outputs are evaluated and cross-checked carefully.

5. Do you think AI tools help you generate ideas or develop research topics?

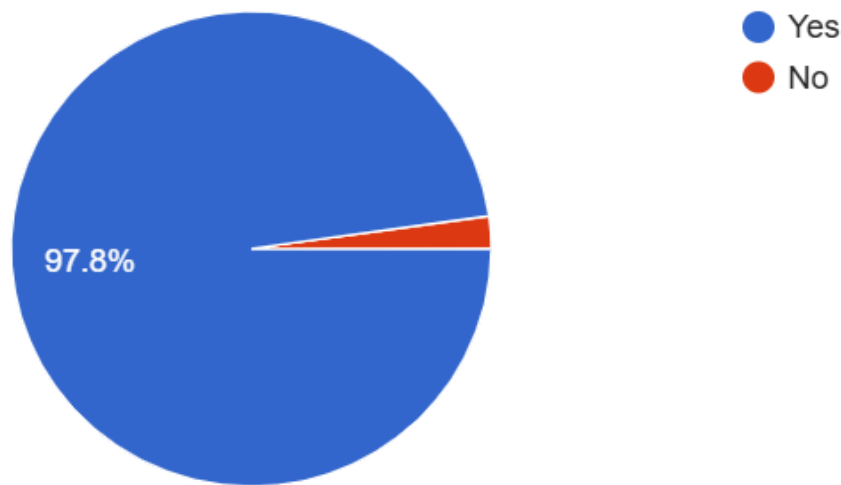


Figure 9: Role of AI Tools in Helping Students Generate Ideas

This question highlights the effects of AI tools on helping students generate ideas to develop their research topics. It is indicated that most participants think that AI tools help them generate ideas or develop research topics with a percentage of (97.8%). They are followed by the remaining (2.2%) of the participants who indicated the opposite, that AI tools do not help them in this regard. This overwhelming agreement suggests that AI tools play a significant role in supporting the early stages of the research process, particularly in helping students brainstorm and explore potential areas of study. The ability of AI to provide instant suggestions, access to a wide range of information, and exposure to various perspectives can spark creativity and guide students toward more refined and relevant research questions. These findings reflect the positive impact of AI tools in enriching students' academic work by fostering idea generation and enhancing their overall research efficiency.

6. To what extent have AI applications enhanced your research process based on your experience?

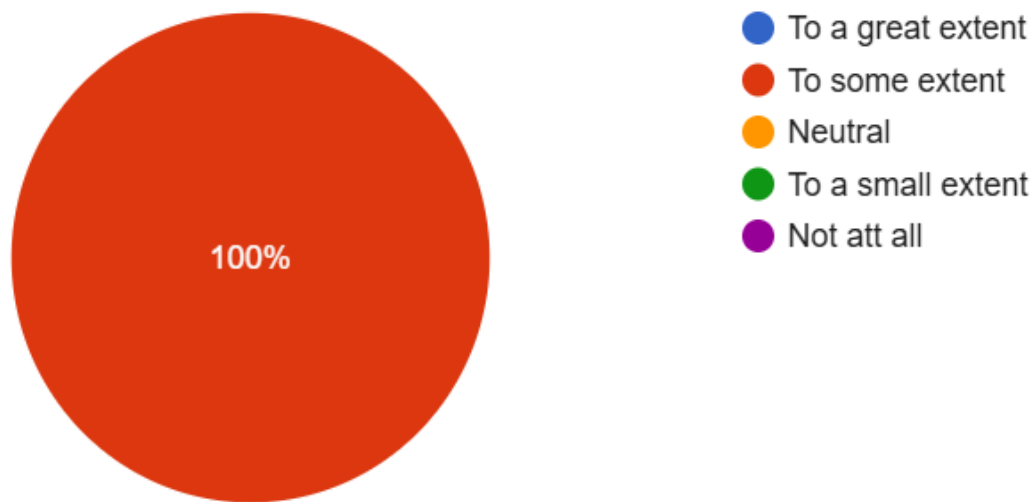


Figure 10: Role of AI Applications in Enhancing the Research Process

This question aims at highlighting the positive role of AI tools and applications in enhancing the research process based on students' true experiences. It is demonstrated through the data provided that all participants believe "to some extent" that AI applications enhanced their research process based on their experience with a percentage of (100%). This shows that using AI tools proved to help students enhance their academic research process in real life experiences.

Section Three: Students Experience in Implementing AI in Research

1. Have you ever used AI tools in any of your academic research projects?

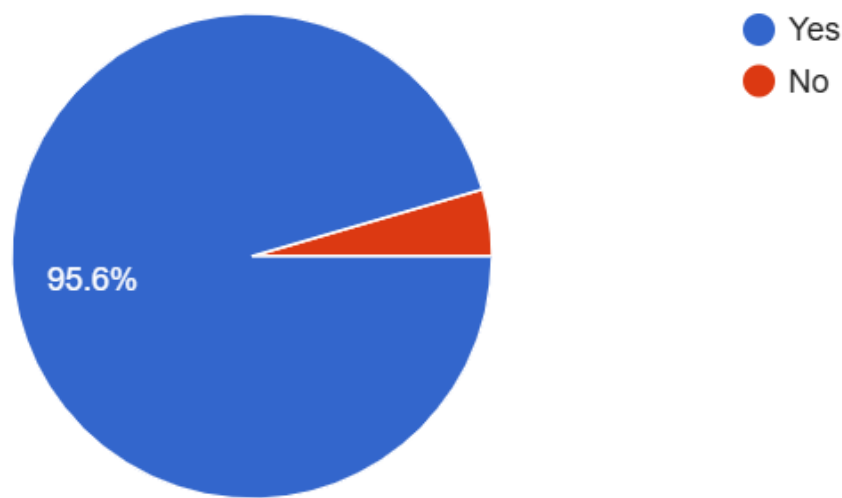


Figure 11: Participants' Use of AI Tools in their Academic Research Projects

The main aim behind this question is to explore participants' experiences in using AI in academic research. The data presented reveals that most participants have prior experience in using AI tools in their academic research projects with a percentage of (95.6%). They are followed by the few remaining participants (4.4%) who indicated their lack of experience in using these tools in the field of research. These findings suggest that the selected sample could provide valuable information about the role of AI tools in conducting research based on their own real life experiences.

2. How often do you use AI tools in your research activities?

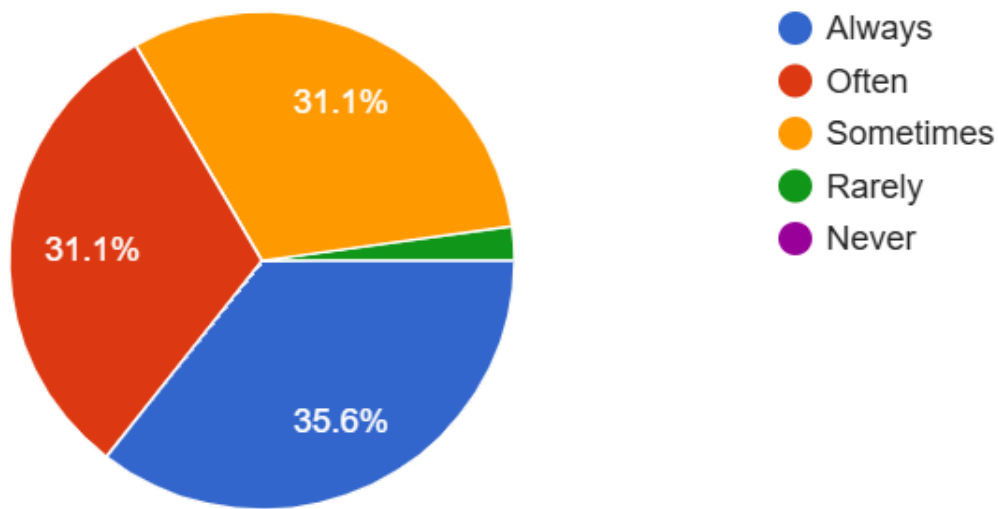


Figure 12: Participants' Frequency in Using AI Tools in Research Activities

This question aims to highlight the frequency with which students use AI tools in activities related to conducting academic research. The results show that the majority of participants selected “Always” (35.6%), “Often” (31.1%), and “Sometimes” (31.1%), indicating a high level of engagement with AI tools throughout the research process. Only one participant (2.2%) reported “Rarely” using these tools. These findings directly support the research question by demonstrating that students frequently rely on AI tools, which suggests that these technologies play a consistent and potentially significant role in enhancing the efficiency and quality of their academic research practices.

3. Which AI tools have you used in your research ?(You may select more than one.)

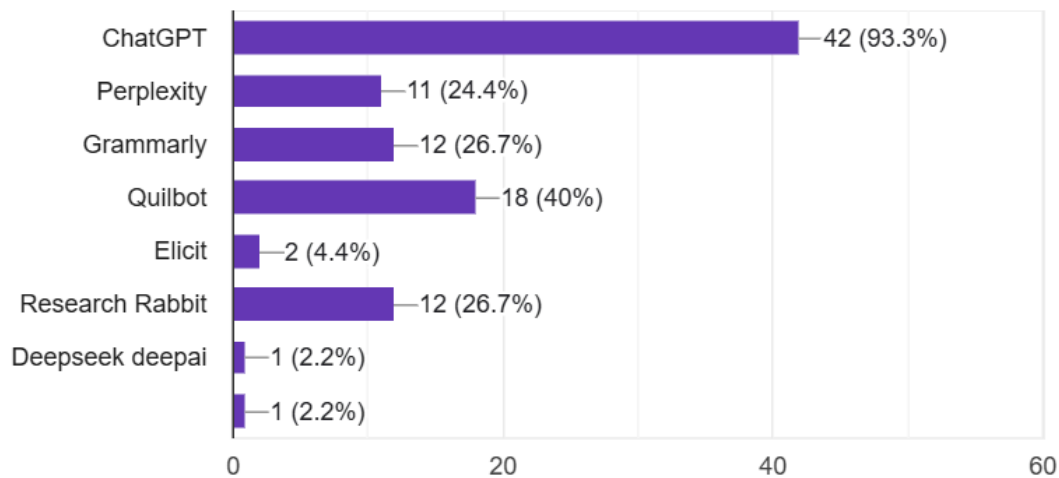


Figure 13: The Use of Particular AI Tools in Academic Research

This question aims at identifying the particular AI tool that students use in conducting their research. It is shown through the data presented that most participants chose “ChatGPT” with a percentage of (93.3%). The second most selected AI tool used by students is “QuillBot” with a percentage of (40%). Grammarly and Research Rabbit are also selected with an equal percentage of (26.7%), followed by Perplexity (24.4%) and Elicit with a smaller percentage of (4.4%). There is only one participant who indicated his use of DeepSeek with a percentage of (2.2%). These findings suggest that the most popular AI tools in the field of academic research are ChatGPT, QuillBot and Grammarly, which suggest their effectiveness in enhancing the research process for EFL learners.

4. For what purposes do you use AI tools in your research ?(select all that apply.)

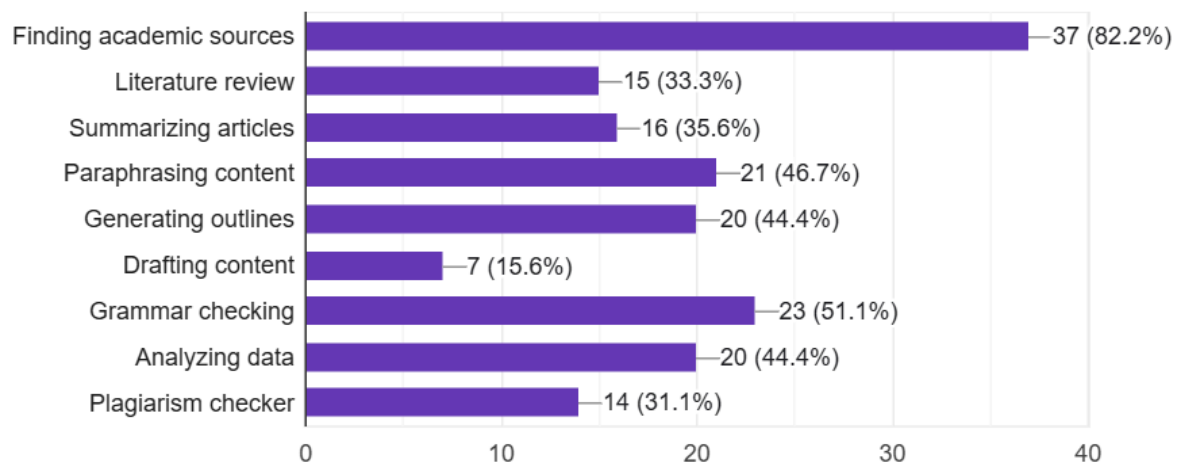


Figure 14: Participants' Purposes in Using AI Tools in Research

The aim of this question is to identify the specific purposes for which students use AI tools. The data presented shows that the aim was to “find academic resources” (82.2%). It is followed by “generating outlines” and “analyzing data” which are selected with a percentage of (44.4%). The most common uses of these tools in research also include “grammar checking” (51.1%), “paraphrasing content” (46.7%), “summarizing articles” (35.6%) and “conducting the literature review” (33.3%). These answers underscore the main uses of AI tools in conducting academic research, and they all show that students mainly use these tools to help them in facilitating the challenging research aspects that take time and effort, and in refining their research and adding more accuracy to its findings. There are other minor uses such as “plagiarism checking” (31.1%), and “drafting content” (15.6%).

5. How much of your research process involves the use of AI tools?

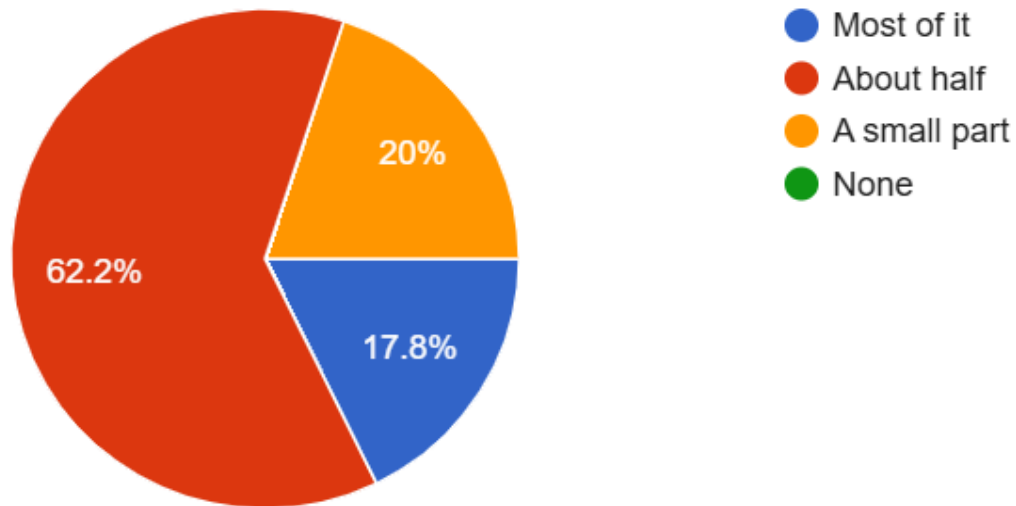


Figure 15: Participants' Description of AI Involvement in their Research Process

This question aims at examining the amount of involvement of AI tools in students' academic research process. The data shows that most participants selected "about half" with a percentage of (62.2%), indicating that the research process of these participants includes half human effort and half AI assistance, reflecting the major contribution of AI tools in academic research. Moreover, there are other participants who chose "a small part" and "most of it" with a percentage of (20%) and (17.8%) respectively, showing the varying degrees of reliance on AI tools in conducting academic research.

Section Four: Suggestions and Recommendations

1. What suggestions do you have for improving the use of AI tools in research?

In this question students are asked if they have any additional comments or suggestions regarding their overall experience with using AI tools in their research. The data collected through this question reveals that students provided different suggestions for the aim of improving the use of AI tools in academic research. They include:

- **Provide Researchers' Training and Education:** several participants expressed that researchers, either students or teachers in the academic field, need professional training that shows them the accurate and ethical use of AI tools in the field of academic research. This training also highlights the need to show researchers how to use AI tools in conducting research tasks without risking the drawbacks of plagiarism and overreliance.
- **Data quality and management:** other participants suggested that the effectiveness of AI tools depends heavily on the quality of the data they are trained on or work with. Therefore, improving data collection methods, ensuring datasets are reliable, and using trusted sources can significantly enhance the value AI brings to research.
- **Appropriate Selection of AI Tools:** participants highlighted the importance of selecting suitable and effective AI tools that could contribute to enhancing their academic research process. They indicated that the AI tools should be simple to use, easily incorporated into many study fields, and built so that users can grasp their decisions and functions. Additionally, several participants suggested putting assessment procedures in place to guarantee AI tools operate as planned and generate reliable results. This shows the importance of assessing the use of AI in the field of academic

research to ensure their effectiveness in this field and monitor the students' implementation of these tools.

- **Using AI Tools as Assisting Tools:** there are few participants who recommended that AI tools should be seen as support systems rather than replacements for human reasoning and efforts in conducting academic research. They can be particularly useful for tasks such as finding resources for conducting literature reviews, summarizing data and information, generating ideas, organizing content, or even supporting peer review and feedback processes. However, it is important that researchers maintain their own analytical and critical thinking abilities by not relying exclusively on AI.

2. Are there any concerns or limitations you think should be addressed when using AI in research?

The data collected through this question indicates that students have several concerns regarding the use of AI tools in the research process. They include:

- **Ethical and Privacy Issues:** many participants expressed their concerns about using AI tools in conducting research. They stated that using AI excessively, copying content without giving due credit through citation, or not disclosing its use could all be considered academic integrity violations. In addition, concerns about privacy were also raised, particularly in relation to how AI-driven research processes handle private or sensitive data, indicating that the information inserted in these AI technologies could be violated or breached.
- **Bias:** other participants also highlighted this issue, indicating that AI systems can reflect and even amplify biases present in the data they are trained on. This could lead to unfair or inaccurate research outcomes.

- **Over Reliance on AI Tools:** the problem of overreliance on AI tools is frequently addressed through participants' responses, indicating that when students excessively use these tools, this could lead to a decline in their essential academic skills such as analysis, evaluation, and original thought. This shows the negative impact on AI tools on reducing one's critical thinking and creativity.
- **Accuracy and Reliability:** the lack of accuracy of the information generated by AI tools is another concern that has been addressed by the participants of the study. They stated references or unsupported claims. This unreliability poses a serious risk if not carefully checked and validated by the researcher.

3. What ethical considerations should be taken into consideration while integrating AI tools in academic research?

The data collected through this question indicates that there are only two participants who answered this question. They stated that accountability, no plagiarism transparency, bias mitigation, and privacy protection are the main ethical considerations that should be taken into consideration while integrating AI tools in academic research. This shows that there are some practical procedures that could be taken in order to reduce the drawbacks of using AI in academic research.

4. What challenges have you faced while using AI tools in your research?

The data provided through this question indicates that students may not have understood the aim behind this question. This question is proposed to identify the practical challenges of using AI tools in academic research. However, their responses indicate that they understood it to be examining the drawbacks of using AI tools in research, they listed bias, inaccuracy of information, privacy and ethical issues as the main challenges that AI tools can sometimes generate incorrect or misleading information, including false.

2.1.1.5. Discussion of the Main Findings

The data collected from the participants reveals that most of them have an “intermediate” level of English proficiency (60%), which reflects their suitability to use both AI tools and their involvement in academic research endeavors. Moreover, most participants indicated their active engagement with AI tools and their regular use of these technologies in their learning process and academic research as well. In terms of digital literacy, 80% of the participants described their level as “average,” meaning they are capable of performing basic tasks using these applications. These findings provide encouraging results regarding the familiarity of the participants with AI tools and their integration of these technologies in their research process, which suggests that they could provide relevant information about the use of AI tools in enhancing the research process based on their own experiences.

A large majority of participants believe that AI tools enhance the efficiency of conducting research. Notably, most of them “agree” or “strongly agree” that AI tools should be integrated into academic research practices. Moreover, 95.56% of the participants expressed confidence in using AI for academic purposes, which highlights their positive perceptions of the technology. Evidently, AI tools were largely seen as beneficial in helping students generate ideas and develop research topics. All participants believed that AI applications have enhanced their research process “to some extent,” and the majority reported prior experience using AI tools for academic research tasks. When asked about the frequency of AI tool usage, most students chose “always,” reflecting consistent integration of these tools into their research routines. These results reflect the benefits of using AI tools and how they can help the researchers generate innovative ideas and develop their resource topics through providing resources and academic articles that could be used to construct their literature review with more efficiency. Therefore, these benefits explain why students frequently integrate AI tools in their research process. When asked about the degree of reliance on AI tools, most participants

selected “about half,” with 62.2% indicating that their research process consists of equal contributions from human effort and AI assistance. This points to a significant but balanced role of AI in students’ academic work. It also highlights the dominant role that AI plays in the field of academic research nowadays, to reach to the point where it is equally used as much as human effort and involvement. This only highlights the significance of these tools and their positive role in improving the research quality.

However, despite this optimism, most students only “partially trust” the information generated by AI tools, indicating a level of critical awareness and skepticism towards the accuracy of the information generated by AI tools. It was revealed through the participants’ responses that the issue of accuracy was highlighted, as participants noted that AI-generated content can sometimes be misleading or incorrect. Several others concerns were also addressed by the participants regarding the use of AI in academic research. The major ones are related to ethical and privacy issues, with participants expressing worries about plagiarism, lack of citation, and potential breaches of sensitive and private data. Another major concern was bias, as AI tools can inherit and amplify biases from their training data, leading to distorted or unfair research outcomes. In addition, overreliance on AI tools was also frequently mentioned, with students fearing a decline in essential academic skills such as critical thinking, researching skills and creativity.

In addition, “ChatGPT” was found to be the most frequently used AI application, selected by 93.3% of participants. This was followed by “QuillBot” (40%), while “Grammarly” and “Research Rabbit” were both chosen by 26.7%. These tools were used for a variety of purposes. The most common was “finding academic resources” (82.2%), followed by “grammar checking” (51.1%), “paraphrasing content” (46.7%), “generating outlines” and “analyzing data” (both at 44.4%), “summarizing articles” (35.6%), and “conducting the literature review” (33.3%). Less common uses included “plagiarism checking” (31.1%) and

“drafting content” (15.6%). These results indicate that students primarily rely on AI tools for time-consuming and cognitively demanding aspects of research. Therefore, it could be stated that the main services that these AI offer contribute to accelerating the research process and saving time for researchers through helping conduct tasks that usually takes both time and effort using the traditional research method.

Considering the positive role of AI tools in the field of academic research, participants provided several suggestions for improving the integration of AI tools in this field. First, many emphasized the importance of providing professional training and education for researchers to ensure the accurate and ethical use of AI. This includes avoiding issues such as plagiarism and overreliance. Second, some highlighted the need to enhance data quality and management, emphasizing that the usefulness of AI tools heavily depends on the quality of the data they are trained on. Third, participants stressed the need for careful selection of AI tools, preferring those that are user-friendly, transparent, and adaptable to various fields of study. Finally, several students advocated for viewing AI as a supportive aid rather than a replacement for human reasoning, maintaining that critical thinking and analytical skills should remain central to the research process.

In response to a question on ethical considerations, only two participants provided answers. They emphasized the importance of accountability, transparency, bias mitigation, privacy protection, and avoiding plagiarism as key principles for the ethical integration of AI in research. These insights, though limited in number, suggest practical strategies for minimizing the drawbacks associated with AI use in academic settings.

2.1.1.6. Implications and Pedagogical Recommendations

The study aims at exploring the role of AI tools in enhancing research proficiency. The findings reveal the growing integration of AI tools in academic research among EFL students,

who generally demonstrate both the linguistic and digital competence necessary for their effective use. Participants recognize the value of AI in enhancing research efficiency, particularly in tasks such as citing academic materials, checking grammar, paraphrasing, summarizing, and developing research ideas. While the overall perception of AI tools is positive, with many students regularly incorporating them into their research practices, there remains a cautious attitude regarding the accuracy and trustworthiness of AI-generated content. Ethical concerns, such as issues of plagiarism, data privacy, bias, and overreliance, were frequently noted, highlighting the need for responsible and informed ethical use. To address these challenges, students suggested implementing training programs, improving data quality, carefully selecting appropriate tools, and promoting AI as a supportive aid rather than a substitute for critical thinking. These insights affirm the potential of AI to support academic research while emphasizing the importance of maintaining ethical standards and human judgment throughout the research process.

In conclusion, the study offers the following recommendations:

For Teachers:

- Teachers should encourage their students to use AI tools wisely and in an ethical way that promotes their research proficiency and quality, for the aim of avoiding its drawbacks.
- Teachers should consistently increase their knowledge about the latest trends of AI tools and the latest developments in the field so that they can invest them in their language teaching methods and strategies. This knowledge serves as a valuable guide for students to show them how they can benefit from AI technologies in conducting their research.

For Students:

- Students should be careful with their selection of AI tools, they should rely on those that are user-friendly, transparent, and adaptable to various fields of study.

- Students should view AI as a supportive aid rather than a replacement for human reasoning, maintaining that critical thinking and analytical skills should remain central to the research process.

For Policy Makers:

- Providing professional training and education for researchers to ensure the accurate and ethical use of AI. This includes avoiding issues such as plagiarism and overreliance.
- Enhancing data quality and management, emphasizing that the usefulness of AI tools heavily depends on the quality of the data they are trained on.
- More technology-based resources and materials should be provided in the higher education departments in order to promote the use of AI in the field of academics, and improve its quality.
- Ethical guidelines should be developed through national or institutional policies on the responsible use of AI in research, addressing issues such as plagiarism, data privacy, and misinformation.

2.1.1.7. Limitations of the Study

The study was met with a number of limitations. The major one was the difficulty in collecting data from the participants of the study. The students were reluctant to offer their contribution to the process.

Conclusion

This chapter provided a detailed account of the collected data, analysis and interpretation process. It demonstrated how the data were collected from the participants of the study, analysed and discussed to draw the final conclusion of the research. The findings revealed strong support for this integration and that students have the digital and language skills

to use AI tools effectively, especially for tasks like citation, grammar checks, paraphrasing, summarizing, and idea generation in their research process. While most students view AI tools positively and use them regularly, concerns about accuracy, trustworthiness, plagiarism, data privacy, bias, and overreliance persist. Students recommend training, better data quality, careful tool selection, and promoting AI as a support, not a replacement, for critical thinking.

General Conclusion

General Conclusion

The present study aims at exploring the potential of AI tools and their use in research to enhance its efficiency. The study follows an exploratory research design with a quantitative approach that aims at exploring EFL students' perceptions of the use of AI tools in enhancing academic research efficiency. The population includes Master Two students of English, department of Letters and Languages at Mila University Center. A questionnaire was administered to 45 students who formed the sample of the study. This process aims at answering the following research questions: 1. Do Master Two students utilize AI applications as assistant tools to support their research? 2. In what ways do these AI incorporate these tools into their research process? 3. To what extent do these AI applications enhance the research process? 4. What are the challenges that Master two students may find while implementing these research-assisted tools. 5. What ethical considerations should be taken into consideration while integrating AI tools in academic research?

The data collected through the questionnaire's responses is analyzed through descriptive statistics using Google Forms platform. The findings indicate that AI applications are actively used by Master two students to assist with their academic research. Most students stated that they always utilize AI tools in their academic research process, and the majority reported using them regularly and confidently, they mainly use ChatGPT, QuillBot, and Grammarly. Moreover, students were found to use AI tools in a variety of useful ways, mostly for time-consuming and intellectually taxing work, such as locating scholarly materials, checking for grammar accuracy, content paraphrasing, making outlines and doing data analysis, article summarization, reviewing the literature, verification of plagiarism, and content drafting in terms of generating ideas and thoughts. The results showed that these AI tools improve the efficiency of research through providing access to academic resources, topic creation, and idea generation, in addition to saving time and effort through collecting, organizing and analyzing

data. Despite these benefits, students also noted a number of challenges in using AI in academic research, such as providing inaccurate or misleading information, data privacy, lack of citation, and plagiarism. Some students also voiced concerns about an over-reliance on AI, expressing that it could impede the development of critical thinking, creativity, and the capacity for independent research, all of which are key academic skills. These worries show that students have taken a thoughtful and mature approach, understanding both the potential and constraints of AI tools. Regarding the ethical considerations, students emphasized the importance of accountability, transparency, bias mitigation, privacy protection, and avoiding plagiarism. To guarantee that AI is applied sensibly and morally, these ethical guidelines are crucial. Participants also recommended practical enhancements like professional training on ethical AI use for researchers, enhancing the quality of data that is inserted into AI systems, and choosing tools that are clear and easy to use.

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Appendix

The students' Questionnaire

Dear student,

This questionnaire attempts to gather information needed to accomplish a Master's dissertation, which explores EFL students' attitudes towards the role of AI in enhancing academic research efficiency. Your honest and thoughtful responses are pivotal in ensuring the validity of this research. We would like to inform you that this questionnaire is anonymous, and answers are kept confidential to be used for study purposes only.

Please put a tick (✓) to the most appropriate option to your answer and note that more than one answer is possible in some questions. Your comments and further suggestions are welcome.

Section One: General Information

1. How do you evaluate yourself in English?

- ☐ Beginner
- ☐ Intermediate
- ☐ Advanced

2. Do you use AI based tools or applications to improve your level in English?

- ☐ Yes
- ☐ No

3. How would you rate your level of proficiency in operating AI applications?

- ☐ Poor
- ☐ Average

- ☐ Expert

Section Two: Students Attitudes Towards Implementing AI Applications in Research

1. Do you think AI applications help students conduct research more efficiently?

☐ Yes

☐ No

2. Do you believe AI tools should be integrated into academic research practices?

☐ Strongly Agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly Disagree

3. Do you feel confident using AI in your academic research works?

☐ Yes

☐ No

4. Do you trust the accuracy of information generated by AI applications?

☐ Fully Trust

☐ Partially Trust

☐ Do Not Trust

5. Do you think AI tools help you generate ideas or develop research topics?

☐ Yes

☐ No

6. To what extent have AI applications enhanced your research process based on your experience?

☐ To a great extent

☐ To some extent

☐ Neutral

☐ To a small extent

☐ Not at all

Section Three: Students Experience in Implementing AI in Research

1. Have you ever used AI tools in any of your academic research projects?

☐ Yes

☐ No

2. How often do you use AI tools in your research activities?

☐ Always

☐ Often

☐ Sometimes

☐ Rarely

☐ Never

3. Which AI tools have you used in your research? (You may select more than one.)

☐ ChatGPT

☐ Perplexity

☐ Grammarly

☐ Quillbot

☐ Elicit

☐ Research Rabbit

☐ Others

4. For what purposes do you use AI tools in your research? (Select all that apply.)

☐ Finding academic sources

☐ Literature review

☐ Summarizing articles

☐ Paraphrasing content

☐ Generating outlines

☐ Drafting content

☐ Grammar checking

☐ Analyzing data

☐ Plagiarism checker

☐ Other

5. How much of your research process involves the use of AI tools?

☐ Most of it

☐ About half

☐ A small part

☐ None

Section Four: Suggestions and Recommendations

1. What suggestions do you have for improving the use of AI tools in research?

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2. Are there any concerns or limitations you think should be addressed when using AI in research?

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3. What ethical considerations should be taken into considerations while integrating AI tools in academic research?

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4. What challenges have you faced while using AI tools in your research?

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Thank you for taking the time to complete this questionnaire.

Résumé

L'intégration de l'intelligence artificielle dans le domaine de l'éducation a acquis une grande importance, en particulier dans le domaine de la recherche universitaire. La recherche vise à mettre en évidence l'importance, les enjeux et les problèmes éthiques liés à l'application de l'intelligence artificielle dans ce domaine. Les résultats, débriefing, et génération d'idées. La grande majorité des étudiants ont une attitude positive à l'égard des outils d'intelligence artificielle et les utilisent régulièrement dans le cadre de leur travail académique. Toutefois, plusieurs défis demeurent, notamment l'exactitude, la crédibilité, le plagiat, la confidentialité des données, les préjugés et la dépendance excessive à l'égard de l'intelligence artificielle. En conclusion, l'étude présente un ensemble de recommandations et de propositions visant à soutenir l'utilisation efficace et éthique de l'intelligence artificielle dans la recherche universitaire.

Mots Clés: Intelligence Artificielle, Recherche Académique, Efficacité de la recherche, amélioration de la recherche académique.

المخلص

اكتسب دمج الذكاء الاصطناعي في مجال التعليم أهمية كبيرة وخاصة في ميدان البحث الأكاديمي. يهدف البحث لتسليط الضوء على الأهمية، والتحديات، والمشاكل الأخلاقية المتعلقة بتطبيق الذكاء الاصطناعي في هذا المجال. تكشف النتائج عن دعم قوي لدمج أدوات الذكاء الاصطناعي في عملية البحث الأكاديمي، حيث يُظهر المتعلمون كفاءة رقمية ولغوية كافية لاستخدام هذه الأدوات بفعالية، خصوصًا في مهام مثل التوثيق، وتصحيح القواعد، وإعادة الصياغة، والتخليص، وتوليد الأفكار. كما أن الغالبية العظمى من الطلاب لديهم نظرة إيجابية تجاه أدوات الذكاء الاصطناعي ويستخدمونها بانتظام في الأعمال الأكاديمية. ومع ذلك، لا تزال هناك عدة تحديات، منها ما يتعلق بالدقة، والمصداقية، والانتحال، وخصوصية البيانات، والتحيز، والاعتماد المفرط على الذكاء الاصطناعي. ختامًا، تقدم الدراسة مجموعة من التوصيات والمقترحات لدعم الاستخدام الفعّال والأخلاقي للذكاء الاصطناعي في البحث الأكاديمي.

الكلمات المفتاحية: الذكاء الاصطناعي، البحث الأكاديمي، كفاءة البحث، تعزيز البحث الأكاديمي.