University of Zawia

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Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at University of Zawia

A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Arts in Applied Linguistics

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Abstract

This study investigates the use of artificial intelligence (AI) as a facilitating technological tool in master's thesis writing among EFL postgraduate students at the University of Zawia. With the increasing use of AI tools in higher education, this study aims to explore students' perceptions, benefits, and challenges associated with AI-assisted thesis writing within the Libyan context. A mixed-methods approach was employed to collect data. A closed-ended questionnaire was distributed to forty-one postgraduate students, and semi-structured interviews were conducted with five Master's students from the English Language program. Quantitative data were analyzed statistically, while qualitative data were analyzed thematically. The findings indicate that the majority of students hold positive perceptions of AI tools, as they help improve language accuracy, enhance organization, and save time during the writing process.

However, concerns were also expressed regarding ethical issues, data privacy, and the risk of excessive dependence on technology and artificial intelligence writing tools. The study concludes that AI can effectively support thesis writing if used in a responsible and ethical manner.

Declaration

Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at the University of Zawia.

I declare that all the material submitted in this work, which is not my own work has been identified with proper citations and referencing and that no material is included which has been submitted for any other assignment of other subjects or courses.

Signature …… Date ……

Dedication

To my beloved parents.

To my husband, Mohammed Al Kawash.

To my family and sisters.

To my family-in-law and friends

Acknowledgments

Alhamdulillah, I would like to begin by expressing my sincere gratitude to Almighty Allah, who granted me the strength, patience, and guidance to complete this thesis. Without His blessings, this achievement would not have been possible.

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I am grateful to my parents for their unwavering efforts in shaping me into the person I am today. Your constant love, selflessness, and support have been the cornerstone of my journey, and I will always be grateful for that.

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List of Abbreviations

AI	Artificial Intelligence
AIED	Artificial Intelligence in Education
AIT	Artificial Intelligence Technology
CSL	Chinese as a Second Language
EFL	English as a Foreign Language
ESL	English as a Second Language
IMRAD	Introduction, Method, Results, and Discussion
LMMs	Large Multi-Modal Models
MA	Master of Arts
NLP	Natural Language Processing
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TPACK	Technological Pedagogical and Content Knowledge
UNESCO	United Nations Educational, Scientific and Cultural Organization

CHAPTER ONE

INTRODUCTION TO THE RESEARCH

1.0 Introduction

The increasing integration of Artificial Intelligence (AI) tools in education has significantly influenced university students' approaches to learning and managing academic tasks. The study examines the role of artificial intelligence as a facilitating technological tool in Master's thesis writing at the University of Zawia, focusing on the attitudes, perceptions, and experiences of postgraduate students.

This chapter presents the background of the study, the statement of the problem, the objectives of the study, and the research questions. It also discusses the significance of the study, the research methodology, and the overall organization of the thesis.

1.1 Background of the Study

In the contemporary educational context, students are often referred to as "digital natives" due to their familiarity with and frequent use of technology. This familiarity equips students with digital skills that support the effective use of technological resources, particularly in academic writing in English (Elnadeef, 2023). Technological advancements have reshaped many sectors, including education, and artificial intelligence has emerged as one of the most influential innovations in this field.

Research indicates that AI technologies are increasingly being used in education due to their potential to enhance learning and instructional practices (Lukianets & Lukianets, 2023). In academic writing, AI tools assist students with tasks such as generating ideas, organizing content, analyzing data, checking grammar, and improving overall writing quality. These features are particularly valuable for postgraduate students engaged in demanding academic tasks such as thesis writing.

For students studying English as a Foreign Language (EFL), writing a master thesis presents additional challenges related to language proficiency, academic conventions, and clarity of expression. Phillips and Pugh (2010) argue that thesis writing requires a high level of writing competence and goes beyond simply summarizing research

findings. Many postgraduate students struggle with academic vocabulary, structuring complex ideas, and maintaining coherence and accuracy in their writing.

In this context, AI tools can serve as supportive resources that enhance writing efficiency, build students' confidence, and improve their academic English skills. This study aims to explore EFL postgraduate students' perspectives at the University of Zawia regarding the use of AI as a facilitating tool in thesis writing, with particular emphasis on academic improvement.

Writing a thesis is a critical requirement in postgraduate programs, as it involves extensive research, critical thinking, and synthesis of information. While AI tools offer potential benefits, it is also essential to consider students' concerns, such as overreliance on technology and issues related to academic authenticity (Vieira et al., 2019; Ali et al., 2023).

Although existing literature highlights the advantages of AI in education, limited research has focused specifically on its role in EFL postgraduate thesis writing. This study seeks to address this gap by examining how postgraduate students at the University of Zawia perceive and use AI in their thesis writing process. The findings are expected to contribute to improving academic practices and policies that support students in their theses writing journey.

1.2 Statement of the Problem

The rapid development of Artificial Intelligence has a significant impact on education. AI-driven technologies are recognized for their potential to support social development and contribute to achieving sustainable development goals (UNESCO, 2021). Pedro (2020) emphasized that AI applications in higher education can enhance learning experiences, increase student motivation, reduce dropout rates, and support personalized learning pathways.

Despite these advantages, writing a master's thesis remains a challenging task for many postgraduate students, as it requires advanced research skills, critical analysis, and academic writing competence. AI tools such as grammar checkers, paraphrasing tools, and reference management systems may reduce some of the difficulties associated with

thesis writing. However, concerns remain regarding their effectiveness, usability, ethical use, and the risk of dependency.

There is a lack of research that specifically examines how postgraduate students perceive and use AI tools in thesis writing, particularly in the Libyan context. Therefore, this study aims to investigate the implications of using AI in master's thesis writing among postgraduate students at the University of Zawia. Understanding students' experiences and perceptions will contribute to discussions on the appropriate and effective use of AI in higher education.

1.3 Objectives of the Study

The objectives of this study are:

1. To explore postgraduate students' perspectives on the usefulness of Artificial Intelligence tools in thesis writing.
2. To identify the perceived benefits and challenges of integrating AI tools into the thesis writing process.

1.4 Research Questions

This study seeks to answer the following questions:

1. How do EFL postgraduate students at the University of Zawia perceive the usefulness of Artificial Intelligence tools in their thesis writing?
2. What are the perceived benefits and challenges of using Artificial Intelligence in thesis writing?

1.5 Significance of the Study

This study is significant as it provides insights into postgraduate students' perceptions of Artificial Intelligence as a supportive tool in Master's thesis writing at the University of Zawia. By examining both the benefits and challenges of AI use, the study contributes to a better understanding of how these tools can support academic writing.

The findings may assist educators, researchers, and policymakers at the educational institutions in making informed decisions regarding the integration of AI in

postgraduate programs. Additionally, this research adds to the growing body of literature on AI in higher education, particularly within the context of EFL students. The study also offers practical recommendations for improving thesis writing through the responsible and effective use of AI tools.

1.6 Methodology

This study adopts a mixed-methods research approach, combining quantitative and qualitative methods. Data were collected using a questionnaire and semi-structured interviews. The research sample included forty-one postgraduate students enrolled in the English Language Master's program at the University of Zawia. Semi-structured interviews were conducted with five postgraduate students to gain deeper insights into their experiences. The questionnaire was administered online using Google Forms to facilitate easy access and participation. The quantitative data obtained from the questionnaires were analyzed using descriptive statistics, including frequencies and percentages. These analyses were used to summarize and describe students' response. While the qualitative data collected through semi-structured interviews were analyzed using thematic analysis. The interview responses were transcribed, coded, and organized into themes to identify common patterns and key ideas related to students' perceptions of using artificial intelligence in thesis writing.

1.7 Organization of the Study

The thesis is organized into five chapters. Chapter one presents the introduction, including the background of the study, statement of the problem, objectives, research questions, significance of the study, methodology, and organization of the study. Chapter two reviews the relevant literature and theoretical framework related to Artificial Intelligence in education and academic writing. Chapter three outlines the research methodology, including the research design, participants, data collection instruments, and data analysis procedures. Chapter four presents the findings based on quantitative and qualitative data. Finally, chapter five discusses the findings, followed by conclusion, limitations of the study, recommendations, and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the relevant literature related to the focus of the current study. It begins with an overview of the theoretical foundations that inform the research, followed by a discussion of the concept of Artificial Intelligence (AI) technology. The chapter then presents definitions and types of artificial intelligence, with particular attention to its role in education and higher education, as well as the importance of AI technology in the higher education context.

The chapter also explores the concept of writing, including definitions of writing and academic writing, as well as the characteristics and genres of academic writing, and discusses thesis writing. It also examines the challenges associated with academic writing. Furthermore, it highlights the importance of artificial intelligence in academic writing and reviews AI applications and tools used in academic writing and research. In addition, students' perceptions toward the use of artificial intelligence are discussed. The chapter concludes with a review of previous related studies and a summary that synthesizes the main points of the literature reviewed.

2.1 Relevant Theories Foundation of the Study

This study is guided by complementary theoretical perspectives that explain students' adoption and educational use of AI writing tools in higher education. When combined, these frameworks offer a multifaceted understanding of the reasons behind students' use of AI tools, how they enhance learning, and the circumstances in which they make a significant contribution to thesis writing.

One of the primary theories underpinning this study is the Technology Acceptance Model (TAM), developed by Davis (1989). Davis proposed that individuals' acceptance and use of new technologies are primarily determined by two central factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which a person believes that using a particular technology will enhance their performance, while perceived ease of use refers to the degree to which the

technology is considered free of effort. These two factors shape users' attitudes, behavioral intentions, and ultimately their actual use of the technology.

In the context of the present study, these constructs are directly related to students' perceptions of AI writing tools. If students perceive these tools as beneficial for improving the quality, efficiency, or organization of their work, and if they find them easy to operate, they are more likely to adopt and consistently integrate them into their academic writing practices. Therefore, TAM provides a clear theoretical foundation for explaining students' willingness to accept and utilize AI technologies during thesis preparation.

The second is Piaget's constructivist learning theory (1954) provides a foundational framework for this study. Constructivism suggests that learning occurs most effectively when students actively engage with knowledge and construct meaning through experience and interaction. AI technologies support constructivist learning principles by offering interactive and personalized learning environments that encourage exploration, problem-solving, and active participation (Holmes et al., 2019) .

Furthermore AI tools in constructivism examine how AI tools influence the learning process itself by help students test ideas, enabling iterative drafting, feedback, self-regulated revision, reorganize arguments , and refine language—activities that align with the cognitive work expected in postgraduate thesis writing, particularly for EFL students who have to manage both language form and scholarly content.

The third theoretical underpinning of this study is grounded in Bloom's (1984) Mastery Learning Theory. Bloom (1984) argued that nearly all students can achieve high levels of learning if they are provided with appropriate instructional conditions, continuous feedback, and sufficient time to master content. Mastery learning emphasizes individualized instruction, formative assessment, and corrective feedback to ensure that students achieve competence before progressing to more advanced tasks.

Building upon this theoretical foundation, adaptive learning theory emphasizes the importance of adjusting instructional content based on students' needs, progress, and feedback. AI-powered adaptive learning systems analyze students' performance in real time and provide personalized guidance, targeted feedback, and tailored academic

support. Through this mechanism, AI-based systems operationalize Bloom's principle of mastery by offering immediate corrective input and individualized learning pathways, which can lead to improved academic outcomes (Park & Lee, 2014).

The fourth theoretical perspective underpinning this study is the Technological Pedagogical and Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). The TPACK framework emphasizes that effective learning occurs when technology is aligned with pedagogical approaches and subject-matter knowledge. According to this framework, technology can enhance learning most effectively when it is meaningfully integrated with teaching strategies and subject matter content (Ginting et al., 2022).

In the context of the present study, the technological component represented by AI writing tools, while the content component is represented by academic writing skills, and the pedagogical component is represented by the learning strategies postgraduate students use when writing their theses. Therefore, TPACK offers a helpful perspective for comprehending how AI tools can assist postgraduate EFL students as instructional tools that support the development of academic writing competencies rather than just as technological resources.

Artificial intelligence has opened new instructional possibilities in education, such as personalized learning pathways, intelligent tutoring systems, and automated feedback processes (Hwang et al., 2020). Nevertheless, scholars emphasize that the educational value of AI extends beyond technological capability. Its effectiveness largely depends on how it is pedagogically incorporated and on the extent to which students actively engage with these tools (Selwyn, 2016; Castañeda & Selwyn, 2018). Simply providing access to AI technologies does not automatically translate into meaningful learning improvement without deliberate instructional planning and appropriate academic support.

Despite its capacity to analyze and organize vast amounts of information with remarkable speed, AI remains limited in capturing the nuanced qualities associated with human reasoning, originality, and emotional awareness. For this reason, researchers advocate for an educational model where AI serves as an assistive resource that enhances, rather than substitutes, human intellectual and interpersonal contributions

(Luckin et al., 2016; Wu &Yu, 2023). At the same time, the increasing reliance on AI in academic settings raises important questions concerning academic honesty, the protection of students' data, and the responsible use of AI-generated materials, which collectively emphasize the importance of careful institutional oversight and clear usage guidelines (Williamson, 2017; Qadir, 2023).

In this study, such affordances are relevant not as replacements for human supervision, but as scaffolds that can reduce cognitive load, sustain progress, and promote confidence when students face complex writing tasks. Together, TAM, constructivism, adaptive learning , and Technological Pedagogical and Content Knowledge (TPACK) offer a multi-level rationale for examining how students perceive, adopt, and benefit from AI tools in thesis writing.

2.2 Artificial Intelligence Technology (AIT)

Artificial intelligence (AI) began as a computer science theory and has since grown into a disruptive force in many different fields and industries. This section provides an overview of artificial intelligence in education, including its definition, main types, and applications in education and higher education. Additionally, the importance of artificial intelligence technology in higher education is emphasized to provide a clear theoretical foundation for the current study.

2.2.1 Definition of Artificial Intelligence

Artificial intelligence (AI) is generally described as the ability of computer-based systems to simulate aspects of human intelligence, including learning, reasoning, problem-solving, and decision-making (Fitria, 2021). From a computer science perspective, AI focuses on the development of computational systems designed to replicate elements of human cognitive processes (Rainer et al., 2016). In a broader sense, AI also refers to the capability of machines to perform tasks that have traditionally required human intellectual involvement (Wartman & Combs, 2018; August & Tsaima, 2021).

The advancement of AI is closely linked to data-driven innovation, which enables computer systems and digital devices to perform complex tasks requiring human-like

comprehension and logical reasoning (Russell & Norvig, 2021). AI encompasses several interconnected subfields, among which machine learning and deep learning are widely recognised as the most prominent (Patil et al., 2024).

Machine learning refers to a set of techniques that allow systems to improve performance by learning from data and experience rather than relying solely on explicitly programmed instructions (Patil et al., 2024). Earlier classifications of machine learning identify three primary approaches: supervised learning, unsupervised learning, and reinforcement learning (Mitchell, 1997). Deep learning, in contrast, represents a specialised subset of machine learning that employs advanced neural network architectures to analyse large volumes of unstructured data, including text, images, and speech (LeCun et al., 2015).

Collectively, these technological developments have significantly expanded the scope of AI applications across various sectors, with education representing the primary focus of the present study.

2.2.2 Types of Artificial Intelligence

Artificial intelligence is typically divided into two main types: narrow (or weak) artificial intelligence and general (or strong) artificial intelligence (Bartneck et al., 2020). Narrow AI refers to systems designed to perform specific, well-defined tasks. Examples include applications for language translation, grammar checking, speech recognition, plagiarism detection, paraphrasing, and recommendation systems. While these systems are highly effective within their designated domains, they cannot operate beyond their programmed scope or transfer their knowledge to other tasks.

In contrast, General AI describes machines endowed with cognitive capacities similar to human abilities, including reasoning, learning, and adaptability across a variety of tasks. Unlike narrow AI, General AI is not restricted to a single function and is intended to emulate broader aspects of human intelligence. However, despite ongoing research and theoretical exploration, General AI remains largely under development and has yet to be realized in practical applications (Chen et al., 2020).

Consequently, current AI applications in education, including learning support tools and academic writing assistants, rely primarily on narrow AI systems.

2.2.3 Artificial Intelligence in Education and Higher Education

Artificial intelligence (AI) has become an increasingly prominent topic in educational research due to its capacity to transform teaching practices, learning experiences, and administrative processes.

Although the concept of "artificial intelligence" was formally introduced by John McCarthy in 1956, its practical applications in education emerged in the 1970s, particularly through systems designed to provide personalized instruction and automated feedback (Luckin et al., 2016). In recent years, technological advancements have accelerated the integration of AI across educational contexts, with higher education emerging as a key area of adoption. In universities, AI-based tools are commonly employed to support student learning, enhance retention, and design adaptive learning environments tailored to students' individual characteristics and needs (Pedró, 2020; Dhawan & Batra, 2021).

AI technologies can be classified into learner-facing**,** teacher-facing, and system-facing applications (Baker & Smith, 2019). Learner-facing tools assist students via adaptive platforms and intelligent tutoring systems, while teacher-facing applications support instructional tasks such as assessment, feedback, plagiarism detection, and progress monitoring. System-facing technologies operate at the institutional level, providing data-driven insights for planning, policy-making, and quality enhancement (Zawacki-Richter et al., 2019).

From a conceptual standpoint, AI refers to systems capable of simulating human intelligence, including learning, reasoning, problem-solving, and decision-making (Rainer et al., 2016; Wartman & Combs, 2018; Fitria, 2021). Among its subfields, machine learning enables systems to improve performance based on data and experience rather than explicit programming (Patil et al., 2024), and deep learning, a subset of machine learning, analyses large volumes of unstructured data such as text, images, and speech (LeCun et al., 2015). AI can also be categorized as narrow or general: narrow AI performs specific, well-defined tasks like language translation or

plagiarism detection, whereas general AI aspires to replicate broader human cognitive abilities, including reasoning and adaptability, but remains largely theoretical (Mitchell, 1997; Chen et al., 2020). Consequently, current educational AI applications, including learning support and academic writing tools, rely predominantly on narrow AI systems.

The impact of AI on higher education is evident worldwide. In language education, for instance, intelligent tutoring systems and automated feedback tools enhance student engagement and skill development by personalizing instruction based on performance data (Ali, 2020; Fitria, 2021; Cotton et al., 2023). While AI can increase assessment efficiency and reduce instructors' workload, its integration also raises pedagogical and ethical concerns, including overreliance on technology, academic integrity, and data privacy (Williamson, 2017; Alasadi & Baiz, 2023; Qadir, 2023). Effective implementation, therefore, requires ethically informed strategies that complement, rather than replace, human judgment and critical thinking (Baker & Siemens, 2014).

2.2.4 Importance of Artificial Intelligence Technology in Higher Education

The integration of artificial intelligence (AI) into higher education has received increasing attention due to its potential to enhance teaching, learning, and academic research. AI technologies are widely recognized as valuable tools for improving learning efficiency, personalizing educational experiences, and assisting students with complex academic tasks. By analyzing student data, these systems can adapt instruction to individual needs, provide timely feedback, and support the development of critical skills, thereby contributing to more effective and engaging learning environment.

One of the most frequently emphasized advantages of AI in higher education is its capacity to provide personalized learning support. By analyzing students' academic behaviors and needs, AI systems can deliver individualized guidance, feedback, and learning resources (Kelleher & Tierney, 2018). Such personalized assistance support has been shown to enhance student engagement and motivation, leading to improved learning outcomes. For postgraduate students, this form of assistance is especially important during thesis writing, a process that typically requires sustained feedback and academic guidance.

In addition to supporting students, AI technologies play a significant role in reducing academic and instructional workload. According to Mandernach (2018), AI can automate routine academic tasks such as grading, editing, and formatting, allowing instructors to devote greater attention to supervision and academic mentoring. Similarly, AI-driven learning analytics provide valuable insights into student performance and progress, enabling educators to refine instructional strategies and offer targeted academic support (Baker & Siemens, 2014). These functions influence postgraduate students' perceptions of AI usefulness, particularly when such tools assist in time management and improve the quality of academic work.

The role of AI is particularly significant in English as a Foreign Language (EFL) higher education contexts. The integration of AI-supported technologies into English language instruction has been identified as essential for enhancing language acquisition and achieving instructional goals (Fitriani et al., 2023). AI-powered applications and digital learning tools contribute to the development of academic literacy by providing flexible and interactive learning environments. These platforms specifically support postgraduate EFL students in enhancing the linguistic competence required for thesis writing (Prayudi et al., 2021; Pratama & Hastuti, 2024).

Holmes et al. (2019) examined the effectiveness of AI-based adaptive learning systems in reducing learning disparities among university students. Their findings indicated that AI-supported personalized instruction contributed to narrowing individual learning gaps and promoting more inclusive learning environments.

Similarly, Luckin et al. (2016) investigated the role of artificial intelligence in facilitating personalized learning in higher education. Their experimental study evaluated AI-powered platforms designed to deliver individualized academic support. The results demonstrated that AI systems provided immediate feedback and adaptive learning materials, significantly enhancing students' academic performance and improving their understanding of complex concepts.

Further research indicates that AI-supported learning environments promote active engagement among both students and educators, leading to more effective language learning experiences (Audrain et al., 2021). AI tools provide access to authentic materials, real-world contexts, and continuous practice opportunities, which are

essential for improving academic writing skills in English (Losi, 2022; Zulfa et al., 2023). In particular, intelligent tutoring systems offer immediate and tailored feedback, which is highly beneficial for postgraduate students engaged in thesis writing (Ali, 2020; Cotton et al., 2023).

Recent studies also highlight the effectiveness of AI-powered writing tools in enhancing academic writing skills. Such tools assist students with grammar, coherence, organization, and vocabulary development, thereby contributing to improved writing quality and academic confidence (Coenen et al., 2021). For EFL postgraduate students, AI-based writing support is perceived as especially helpful in addressing common linguistic challenges encountered during thesis writing (Fitria, 2021).

Despite these benefits, the literature also identifies challenges associated with the use of AI in higher education. A major concern relates to the potential misuse of AI tools for academic dishonesty, including the generation of assignments without genuine intellectual engagement (Kavale & Forness, 2019). This concern has prompted calls for the redesign of assessment practices to emphasize critical thinking, originality, and reflective writing processes that are less susceptible to automation (Kulkarni et al., 2015). Additionally, excessive reliance on AI tools may weaken essential academic skills if not used responsibly. Therefore, Gee (2018) emphasizes the importance of maintaining human capabilities such as critical thinking, creativity, and problem-solving, which remain central to academic and research writing.

Overall, the literature suggests that AI technologies are generally perceived as useful tools for supporting postgraduate students in thesis writing by enhancing personalization, language development, and academic efficiency. However, these benefits must be balanced against challenges related to ethical use, academic integrity, and skill development. This body of research provides a strong conceptual foundation for examining EFL postgraduate students' perceptions of the usefulness, benefits, and challenges of using AI tools in thesis writing at the University of Zawia.

2.3 Academic Writing

The concept of academic writing, including the character of writing and its genres explained in this section along with general definitions of writing and its constituent parts. The difficulties of academic writing and thesis writing are also covered.

2.3.1 Definitions

Academic writing is a formal style used in universities and scholarly contexts to communicate knowledge, research findings, and academic arguments in a clear and organized manner. However, before understanding academic writing specifically, it is important to consider writing as a fundamental language skill. Writing is a core skill in English language teaching and learning used for communication, expressing ideas, recording personal experiences, and supporting learning processes (Graham et al., 2007). Because of its significant role in language learning and communication, many researchers have defined writing from different perspectives.

Nurrohmah (2018) defines writing as a form of communication that uses symbols and signs on paper to convey meaning. Similarly, Pamujining Tias (2019) describes writing as a practiced activity through which writers develop their ideas by producing coherent and readable sequences of sentences. In addition, Ngoc (2019) views writing as a cognitive process that enables students to organize and express their thoughts in written form. Cakrawati (2012) emphasizes that writing is a multifaceted skill that requires following certain stages to produce high-quality written work. Likewise, Gautam (2019) highlights the importance of writing skills in education, stating that writing enhances students' understanding of academic content and contributes to positive learning behaviors.

Building upon these general definitions, academic writing is not merely writing in English; rather, it is a specialized form of communication governed by specific conventions related to structure, language use, evidence, and referencing. Writing is a crucial language skill that many students find difficult to master, as producing a coherent text requires the integration of complex ideas, making it a cognitively demanding process (Bailer, 2015).

Academic writing is also understood as a socially constructed practice shaped by the norms and expectations of academic communities (Hyland, 2002). In this respect, it requires accuracy, consistency, and logical organization (Molinari, 2022). Formality and objectivity are central features of academic writing. Avoiding informal expressions and excessive use of personal pronouns helps maintain an objective tone appropriate for scholarly audiences (Osmond, 2016). Similarly, academic writing adheres to established standards and avoids casual language (Jordan, 1999). As a result, academic texts are expected to be focused, impersonal, precise, and open-minded, while conforming to the conventions of specific disciplines (Hyland & Jiang, 2017).

The primary purpose of academic writing is to present evidence-based ideas and arguments effectively. This requires clarity, coherence, and logical development (University of Leeds, 2019). Academic texts typically follow a structured format, commonly consisting of an introduction, body paragraphs, and a conclusion. Such organization supports logical progression and helps readers understand relationships between ideas (Oshima & Hogue, 2007).

In higher education, academic writing plays a vital role in developing students' research abilities, analytical skills, and critical thinking. Wingate (2012) argues that it fosters higher-order thinking skills essential for academic success. However, many students of English as a foreign language experience difficulties due to limited vocabulary, linguistic challenges, and unfamiliarity with academic conventions (Kumar, 2019). Despite these challenges, academic writing remains a fundamental skill for scholarly communication and academic achievement.

2.3.2 Characteristics of Academic Writing

Academic writing differs from other forms of writing through its formal, objective, and precise style. It avoids informal language, slang, contractions, and personal expressions. According to Bailey (2018), clarity, formality, objectivity, and careful use of evidence are core features of academic writing. Consequently, writers are expected to rely on credible sources rather than personal opinions.

Clarity and precision are essential characteristics, requiring writers to express ideas unambiguously and use appropriate academic vocabulary to ensure effective

communication. Another key feature is the use of evidence and proper referencing. Academic texts are developed through engagement with previous research, theories, and empirical data. Effective academic writing involves integrating information from multiple scholarly sources and supporting arguments with accurate citation (Swales & Feak, 2012). Proper referencing is also crucial for maintaining academic integrity and avoiding plagiarism (Pecorari, 2013).

Logical organization further distinguishes academic writing. Ideas are arranged in a clear structure that enables smooth transitions between sections and guides readers through the text (Swales & Feak, 2012). Many research papers follow the IMRAD format—Introduction, Method, Results, and Discussion (Day & Gastel, 2012). In addition, correct language use and grammatical accuracy contribute to producing clear and effective academic texts (Bolsunovskaya & Rymanova, 2020).

Coherence is another important feature, as ideas should flow logically from one sentence and paragraph to the next, making the text easy to follow (Richards, 1985a). Academic writing also values conciseness, using precise language to convey meaning accurately while avoiding unnecessary or vague expressions. Furthermore, it requires original content that is free from grammatical, spelling, and punctuation errors.

2.3.3 Academic Writing Genres

In academic contexts, the term *genre* refers to a specific type of writing shaped by its purpose, audience, and style. Each genre follows particular conventions that influence how information is organized and how ideas are developed. Academic writing includes a variety of genres, each serving distinct functions in higher education and research.

One way to classify writing genres is according to writing styles. Harmer (1998) identifies four main styles: narrative, descriptive, expository, and persuasive. Narrative writing presents events or experiences in the form of a story, while descriptive writing aims to create clear mental images through detailed language. Expository writing focuses on explaining and informing by presenting factual information in a clear and organized manner and is commonly used in academic textbooks, articles, and reports. Persuasive writing, in contrast, seeks to convince readers of a particular viewpoint through logical reasoning and supporting evidence.

In higher education, academic writing encompasses a range of genres, including essays, reports, research proposals, literature reviews, and case studies. Essays critically explore specific issues, while reports present the findings of systematic investigations. Research proposals outline plans for future research, and literature reviews evaluate existing scholarship on a given topic. Dissertations and theses represent extended academic works involving original and comprehensive research. Abstracts and executive summaries also function as academic genres by providing concise overviews of longer texts (Smith, 2019).

Overall, although academic writing genres differ in form and function, they are unified by adherence to established academic conventions, including formal structure, precise language use, and evidence-based argumentation.

2.3.4 Thesis Writing

Thesis writing is widely recognized as one of the most advanced and demanding forms of academic writing at the postgraduate level. A thesis is an academic document submitted in partial fulfillment of an academic degree or professional qualification, presenting the researcher's study and findings. It represents the final and most significant stage of the research process and reflects students' academic maturity and readiness to engage in scholarly communities (Paltridge & Starfield, 2020).

A thesis goes beyond a standard written assignment, as it constitutes a comprehensive research project through which students demonstrate academic competence and the ability to generate original knowledge within their field of study. Kumar (2005) argues that research writing should be clear, accurate, logical, concise, and free from ambiguity. The primary purpose of a thesis is to inform readers about the research problem, the methods used to investigate it, the results obtained, and the implications or recommendations derived from the findings. Accordingly, careful preparation and effective presentation are essential. Burnham (1994, as cited in Best & Kahn, 2014) notes that even valuable research may lose its impact if findings are not communicated clearly, underscoring the importance of high-quality academic writing.

Several scholars highlight that thesis writing involves complex and systematic research and writing processes. Murray (2011) explains that postgraduate students must engage

in tasks such as identifying research problems, reviewing relevant literature, selecting appropriate methodologies, and synthesizing information into coherent academic arguments. Similarly, Swales and Feak (2012) emphasize that thesis writing develops students' ability to construct logically structured texts and position their research within existing scholarly discourse.

In addition to research skills, thesis writing requires a high level of critical thinking. Students are expected not only to summarize previous studies but also to evaluate, compare, and critically assess them in order to identify research gaps (Ridley, 2012). Supporting this view, Hart (2018) explains that the literature review chapter plays a central role in shaping the direction of the study and justifying the chosen research problem.

A thesis typically follows a clear and systematic structure, including an introduction, literature review, methodology, results, discussion, and conclusion. This structure ensures transparency in the research process and allows readers to understand how data are collected, analyzed, and interpreted (Creswell & Creswell, 2018). Each chapter serves a specific purpose and contributes to addressing the research questions.

Compared with other forms of academic writing, thesis writing is particularly demanding because it requires sustained effort over an extended period. It involves continuous drafting, revision, and regular consultation with supervisors. Postgraduate students often face challenges related to organizing large volumes of information, maintaining an appropriate academic style, and managing time effectively (Kumar, 2019). In addition, maintaining academic integrity and avoiding plagiarism remain significant concerns, especially for EFL postgraduate students (Pecorari, 2013).

Furthermore, students who use English as a second or foreign language encounter additional difficulties in thesis writing. Prior (1998, as cited in Paltridge & Starfield, 2007) observes that advanced academic writing differs substantially from earlier writing experiences in both scope and complexity. As a result, EFL students may struggle with multiple aspects of thesis writing simultaneously, which can negatively affect the overall quality of their work.

Overall, thesis writing is one of the most challenging academic tasks in higher education. At the same time, it plays a vital role in developing students' research competence, critical thinking skills, academic integrity, and confidence in scholarly writing.

2.4 Academic Writing Challenges

Writing is a fundamental tool in education for conveying concepts and knowledge through a set of conventions tailored to a specific target audience. It plays a crucial role in the academic proficiency and overall success of English as a Foreign Language (EFL) students at the university level (Tran & Nguyen, 2022). The university level requires careful attention to detail, effective integration of relevant literature, logical organization of ideas, and formal expression. The successful completion of academic assignments, such as research papers, dissertations, and theses, requires not only strong writing skills but also a combination of advanced cognitive abilities, sustained focus, resilience, and sufficient research knowledge (Willis et al., 2010). These requirements render academic writing a complex and demanding task for many students across various educational levels.

In higher education, students are expected to demonstrate advanced critical thinking skills and the ability to communicate ideas effectively through academic writing. However, thesis writing presents particular challenges, especially for students studying English as a Foreign Language (EFL), due to the linguistic and cognitive demands associated with producing lengthy, original academic texts (Lin & Morrison, 2021; Lestari, 2020).

To achieve successful academic writing outcomes, students must develop essential competencies such as coherence, argument development, and accurate referencing practices. When these skills are insufficient, students' academic performance may be negatively affected, academic literacy may remain limited, and the risk of unintentional plagiarism may increase (Graham, 2019).

Even though many universities offer academic writing courses, there are still many difficulties to overcome. Research indicates that novice and graduate writers often struggle with planning, organizing ideas, and initiating the research-writing process,

even after receiving formal instruction (Cheong et al., 2023). Many graduate students lack adequate training in these areas, which contributes to difficulties in producing coherent and effective academic texts. Furthermore, the need for multiple drafts and revisions increases the complexity of the writing process, particularly for students with limited writing proficiency.

Non-native English speakers encounter additional challenges related to language use, including difficulties with idea development, grammatical accuracy, the selection of appropriate academic vocabulary, source evaluation, and the interpretation of instructors' feedback. External factors—such as high academic expectations, time constraints, limited information literacy, and insufficient research skills—further exacerbate students' writing difficulties. Previous research has identified several factors contributing to weak writing performance, including problems with grammar, vocabulary, spelling, and sentence structure (Madison et al., 2019). Moreover, low levels of motivation (De Smedt et al., 2016; Camacho & Alves, 2017) and ineffective or unengaging writing instruction have been reported as significant barriers to the development of academic writing skills (Myers et al., 2016).

In Libyan universities, Omar and Elwerfalli (2018) highlighted that weak grammatical competence is a major factor affecting students' academic writing quality. Similarly, Aldabbus and Almansouri (2022) revealed that Libyan university students face difficulties in academic vocabulary use, thesis statement development, and paragraph coherence due to limited language proficiency and insufficient writing practice opportunities. Additionally, Alsied and Ibrahim (2017) identified multiple research and academic writing challenges faced by Libyan students, including difficulties in conducting research projects and presenting findings academically.

Given the complex and demanding nature of academic and thesis writing, recent technological developments have introduced new opportunities to support students in addressing these challenges. Writing technologies, particularly artificial intelligence (AI)-based tools, have been increasingly recommended as effective aids for academic writing. Previous research suggests that such tools can enhance writing quality, support language accuracy, and facilitate the research and revision processes.

Academic writing involves more than transforming ideas into written text; it requires strategic thinking, effective synthesis of sources, and continuous revision. As a result, the integration of AI technologies into academic writing has emerged as a promising approach to supporting students, especially postgraduate students, in thesis and research writing.

2.5 Importance of AI in Academic Writing

The integration of artificial intelligence (AI) into academic writing has been widely discussed in the literature, particularly regarding its role in supporting students throughout different stages of the writing process. Previous studies indicate that AI-based tools, especially those employing natural language processing technologies, assist students in managing and synthesizing large volumes of academic literature. This support enables students to formulate clearer research questions and develop more coherent arguments in theses and dissertations (Jones & Smith, 2018).

In addition to supporting content development, AI tools contribute significantly to improving language quality in academic writing. Research suggests that AI applications provide personalized feedback on grammar, style, and structure, which helps students refine their writing according to academic conventions and individual needs (Hwang & Chang, 2019). With the growing availability of AI-driven technologies, students can receive continuous assistance during key writing stages, including idea generation, language enhancement, and text revision. Such tools also support the development of academic vocabulary and grammatical accuracy, making the writing process more efficient and less cognitively demanding (Sumakul et al., 2022).

Furthermore, AI-based writing tools serve multiple academic purposes, including text translation, spelling and grammar correction, content analysis, and paraphrasing. Burkhard (2022) highlights that these functions have increased the adoption of AI technologies in both learning and research contexts within higher education. As a result, AI has become an increasingly common component of academic writing practices.

Several empirical studies have highlighted the positive impact of artificial intelligence (AI) on students' English academic writing skills. For instance, Coenen et al. (2021) found that AI-powered writing tools significantly enhance writing accuracy, clarity, and

coherence. Similarly, Ginting & Barella (2022) reported that AI-based writing assistants, which leverage large datasets of human-written texts, are increasingly employed in educational contexts. Further research suggests that the use of AI writing tools can improve students' confidence, productivity, and overall performance in academic writing tasks (Ginting & Barella, 2022; Perkins, 2023).

2.6 Artificial Intelligence Applications and Tools in Academic Writing and Research

Postgraduate students, particularly those studying in English as a foreign language (EFL) contexts, frequently face substantial challenges in academic and thesis writing. These challenges encompass the development of research skills, the identification of research gaps, the organization and synthesis of literature, the maintenance of linguistic accuracy, and the effective integration of theory with empirical evidence. Such difficulties may stem from internal factors, including limited academic writing proficiency, insufficient research experience, and time constraints, as well as external factors, such as inadequate institutional support and academic supervision. In response to these challenges, recent studies have highlighted the increasing role of technological support in enhancing academic writing and research practices. Among these technologies, artificial intelligence in education (AIED) has emerged as a valuable resource for supporting postgraduate students throughout the research and thesis writing process (Chiu et al., 2023).

Artificial intelligence has become a transformative element in academic writing by improving both research efficiency and writing quality. AI-based tools are capable of automate time-consuming and repetitive tasks like text revision, citation management, literature organization, and language proofreading. Consequently, students are able to allocate greater time and cognitive resources to higher-order academic tasks, such as argument development and critical analysis. In particular, tools that leverage Natural Language Processing (NLP) support writers in producing coherent, accurate, and academically appropriate texts by detecting linguistic errors, providing stylistic recommendations, and facilitating adherence to disciplinary conventions (Ginting & Barella, 2022).

One important category of AI applications in academic writing is reference management software. Tools such as Zotero, Mendeley, and EndNote support researchers in organizing extensive bodies of literature, generating accurate citations, and integrating references seamlessly into word-processing environments. Beyond basic reference organization, many of these applications now incorporate AI-driven features, including the detection of duplicate sources, recommendation of relevant literature, and automatic formatting of bibliographies according to specific academic styles (Nazari et al., 2021; Perkins, 2023).

These AI writing aids are designed to assist students in a variety of aspects. Among these writing aids are lexicographic applications such as online dictionaries and thesauruses, grammar-based tools such as Grammarly, and writing-process oriented tools such as QuillBot and Wordtune. AI-powered proofreading and editing tools also play a significant role in enhancing the quality of academic texts. Applications such as Grammarly, Trinka AI, Ginger, and ProWritingAid provide detailed feedback on grammar, coherence, tone, and formality. Through advanced NLP algorithms, these tools assist users in refining sentence structure, improving clarity, and maintaining an appropriate academic register. Such tools are particularly beneficial for non-native English speakers, who often face difficulties related to grammatical accuracy, cohesion, and academic vocabulary use (Teng et al., 2022).

In addition, paraphrasing and text-revision tools—including QuillBot, Wordtune, AI Writer, Typeset, and Spinbot—support students in restructuring sentences and enhancing readability while preserving the original meaning of texts. When used ethically and critically, these tools can help reduce unintentional plagiarism and improve textual coherence (Nazari et al., 2021). Complementing these applications, plagiarism detection systems such as Turnitin, iThenticate, and Copyleaks employ machine-learning algorithms to compare submitted texts against extensive academic databases, thereby promoting academic integrity and discouraging unethical writing practices.

AI technologies have also significantly contributed to content generation and summarization in academic writing. Tools such as ChatGPT, Jasper, WriteSonic, and Claude support students in generating research ideas, structuring academic papers, summarizing complex texts, and refining arguments. For example, Abduljawad (2024)

demonstrated that the use of ChatGPT enhanced essay writing, with improvements observed in sentence cohesion and vocabulary usage. The study employed an Analysis of Covariance to assess controlled posttest performance, providing empirical evidence of the tool's impact on writing quality.

Although these tools cannot replace human critical thinking or scholarly judgment, they can reduce cognitive load during the early stages of writing and support students in structuring their ideas more effectively. Perry (2021) examined the literature on digital writing assistants for second language students and found compelling evidence that these tools are effective when integrated with structured instructional programs. However, the review also highlighted a gap in research regarding the long-term impact of such tools on sustained language learning outcomes. Beyond writing support, AI-based platforms have increasingly facilitated literature discovery and research synthesis. Applications such as Semantic Scholar, Connected Papers, Research Rabbit, and Consensus employ intelligent algorithms to identify influential studies, visualize relationships among research works, and summarize findings from peer-reviewed literature. These tools are particularly valuable for postgraduate students conducting literature reviews, as they streamline the identification of research gaps and the development of conceptual frameworks.

Moreover, AI technologies have become integral to data analysis in both qualitative and quantitative research. Tools such as IBM SPSS Modeler, RapidMiner, Orange, and Python-based machine learning libraries support advanced quantitative analyses, while qualitative research software, including NVivo and ATLAS.ti, now incorporates AI-assisted features for automated coding, sentiment analysis, and theme identification. These capabilities substantially enhance research efficiency, analytical depth, and the rigor of scholarly inquiry.

Overall, artificial intelligence applications provide comprehensive support across all stages of academic writing and research, from literature searching and reference management to writing, revision, data analysis, and plagiarism detection. Their increasing integration into academic practices highlights the potential of AI to enhance research quality, efficiency, and accessibility, particularly for postgraduate students engaged in the complex process of thesis writing. The following table (1) provides a comparative overview of the most well-known AI tools for Academic writing and

research. The table was adapted from the use of AI and technology tools in developing students' English academic writing skills by Zulfa et al. (2023).

Table 1: AI Tools for Academic Writing and Research

Tools		Functions
Language Tools	Grammarly	Grammarly is used to check grammar and spelling in English and to correct writing errors.
	QuillBot	QuillBot assists with rephrasing sentences to prevent plagiarism.
	Smodin	Smodin is utilized for paraphrasing and grammar checks.
	Parapharser.io	Parapharser.io helped to refine the writing and find accurate references.
	Google Translate	Google Translate (GT) is commonly used to translate unfamiliar words.
	U-Dictionary	U-Dictionary enhances the fluency of my academic writing.
	Dictionary.com	Dictionary.com allowed me to verify proper word usage in my academic work.
	Turnitin	Turnitin indicates the percentage of plagiarism in my writing.
Sources	Google Scholar	Google Scholar is a resource for finding journals and references.
	Chat GPT	Chat GPT efficiently locates necessary references using AI.
Saving Track	Microsoft Word	Microsoft Word streamlined the academic writing process.
	Google Docs	Google Docs automatically saved and drafted written content.
References	Mendeley	Mendeley is used for citing references in both the in-text and bibliography.

2.7 Students' Perceptions

Students' perceptions, encompassing their beliefs, attitudes, and interpretations of learning experiences, play a crucial role in motivation, engagement, and academic

achievement. Positive perceptions of learning materials and tools enhance attention, interest, and retention, whereas negative perceptions can reduce participation and learning effectiveness (Turner, 1983).

These perceptions are shaped by a combination of personal characteristics, prior experiences, motivation, and contextual factors, all of which influence how students respond to educational stimuli and engage in academic tasks (Marx, 1983; Biggs, 1989; Ryan & Deci, 2000; Lizzio et al., 2002). Students with positive perceptions are more likely to exhibit independent learning, deep engagement, and reflective thinking.

The Technology Acceptance Model (TAM) highlights that perceived usefulness and ease of use determine students' intentions to adopt technological systems, which subsequently affects their actual usage (Davis, 1989). In technology-enhanced learning environments, these perceptions significantly influence the adoption and effective utilization of digital tools.

TAM further emphasizes the importance of perceptions in the technology adoption; student's intentions to adopt technological systems are influenced by perceived usefulness and perceived ease of use, which in turn determine actual usage. In technology-enhanced learning environments, students' perceptions therefore directly affect whether digital tools are accepted and effectively utilized.

Figure 2.1 illustrates how the Technology Acceptance Model informs the effective use of digital tools by students in technology-enhanced learning environments.

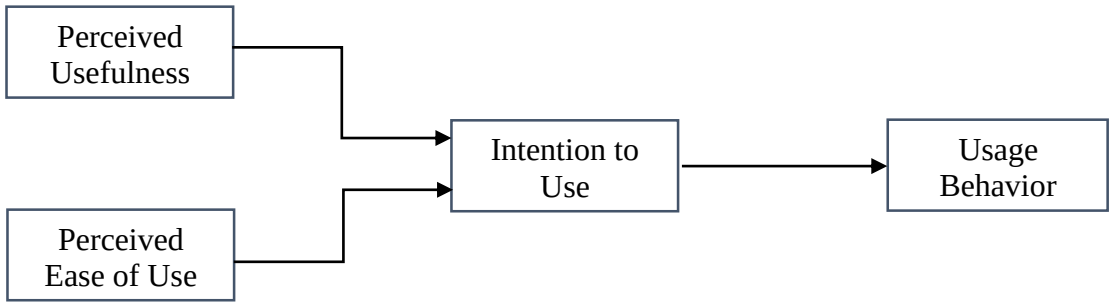


Figure 2.1: Davis Technology Acceptance Model

In EFL higher education, students are more inclined to use AI tools when they are perceived as beneficial, user-friendly, and aligned with academic requirements.

Positive perceptions of AI have been linked to increased motivation, confidence, and engagement, particularly in tasks such as thesis writing and academic research (Scherer et al., 2016; Teo, 2019; Labonté & Smith, 2022). When students perceive AI tools as useful tools, they are more likely to adopt them, especially in complex academic tasks such as thesis writing.

Understanding these perceptions is therefore essential for promoting effective and ethical integration of AI tools in academic learning.

2.8 Previous Related Studies

Numerous scholars have examined the integration of artificial intelligence (AI) in higher education and its influence on students' learning outcomes, engagement, and academic achievement. Early research predominantly focused on explored the integration of artificial intelligence (AI) in students' academic writing within higher education contexts.

For instance, Roberts (2019) examined academic writers' perceptions of AI-powered writing assistants through a mixed-methods approach at a large public university in the United States. The participants were undergraduate students enrolled in first-year composition courses who used AI-powered writing tools as part of their coursework. The findings indicated that the majority of participants demonstrated positive attitudes toward AI tools, reporting enhanced productivity and improved writing quality.

Moreover, Chen and Gong (2025) examined the use of AI-assisted learning in academic writing among Chinese students within a Chinese as a Second Language (CSL) learning context. The study aimed to evaluate the effectiveness of AI tools in enhancing academic writing performance while also exploring their influence on knowledge acquisition, student motivation, and ethical concerns. Using a mixed-methods experimental design involving fifty CSL students, the findings indicated that AI tools significantly improved writing performance by supporting knowledge development, increasing learner motivation, and promoting structured writing processes. However, the study also identified several challenges, including students' over-reliance on AI technologies, concerns related to academic integrity, and occasional inaccuracies in AI-

generated content. These findings emphasize AI's potential as a facilitating writing tool while underscoring the importance of guided and responsible implementation.

Similarly, Winarti et al. (2025) examined English as a Foreign Language (EFL) students' attitudes toward AI-based writing tools in Indonesia. The study aimed to explore students' experiences in using AI technologies when writing English thesis proposals. Employing a descriptive qualitative research design involving 35 students, along with follow-up interviews with 10 participants, the findings demonstrated that AI significantly facilitated academic writing by improving grammatical accuracy, idea organization, and argument development. Furthermore, AI tools were found to reduce writing anxiety and assist students in generating academic content. Nevertheless, concerns related to excessive reliance on AI and ethical issues regarding originality and plagiarism were also reported. The study concluded that AI technologies can effectively support academic writing when accompanied by appropriate AI literacy and responsible use.

Rodafinos (2025) further explored the integration of generative AI tools in academic writing within advanced research contexts at a major Greek university. The study aimed to investigate the extent to which AI tools facilitate students' research and writing processes. Using a qualitative case study approach involving 45 first-year students enrolled in a Research Methods course, the findings indicated that AI technologies enhanced writing efficiency by assisting students with literature reviews, research question development, data analysis, and thesis organization. However, the study emphasized the necessity of critically evaluating AI-generated content to maintain academic standards. The research suggested that AI tools function as academic facilitators that can improve research productivity when integrated with traditional scholarly practices.

Additionally, Saad et al. (2025) examined the impact of AI-assisted writing tools on academic discourse in Malaysian higher education institutions through a narrative literature review of studies published between 2018 and 2025. The study aimed to evaluate the extent to which AI technologies enhance academic writing quality, particularly among non-native English speakers. The findings demonstrated that AI tools improved writing clarity, coherence, and academic rigor. However, the study also highlighted ethical concerns related to authorship, originality, and academic integrity.

The researchers emphasized that successful integration of AI as a facilitating technological tool requires clear ethical guidelines and institutional support.

Bensalem et al. (2024) also explored Saudi undergraduate students' perceptions and utilization of AI writing tools through a mixed-methods survey involving 161 participants. The findings revealed that students frequently used AI tools for completing assignments, paraphrasing, and grammar correction. Participants described these tools as efficient and time-saving. Nevertheless, ethical concerns related to academic integrity were raised, as students feared that excessive dependence on AI tools might weaken their writing competence. The study recommended that educational institutions develop clear policies and training programs to ensure responsible AI use in academic writing.

Within the Libyan context, several studies have investigated the effectiveness, benefits, and challenges associated with AI writing tools using diverse research. For example, Alnaass and Jamoom (2025) explored the role of artificial intelligence in academic writing pedagogy in Libyan universities through a qualitative research design. The study utilized semi-structured interviews with EFL university instructors to examine their perceptions of AI integration in writing instruction. The findings revealed that AI tools provide immediate feedback, grammar correction, and structural guidance that enhance students' writing quality. However, instructors emphasized the necessity of regulating AI use to prevent overreliance and to preserve students' critical thinking skills.

Despite the positive findings reported in previous research, most studies have focused primarily on general academic contexts and undergraduate students. Consequently, limited research has examined the perceptions of EFL postgraduate students regarding artificial intelligence as a facilitating technological tool in thesis writing. Furthermore, few studies have been conducted within the Libyan higher education context, particularly at the University of Zawia. Therefore, the present study seeks to address this research gap by investigating EFL postgraduate students' perceptions of using AI tools in the thesis writing process.

2.9 Summary of the Chapter

This chapter reviewed the literature on artificial intelligence in education, academic writing, and thesis writing, with particular attention to students' challenges and perceptions. Previous studies have shown that AI tools can enhance writing quality, research efficiency, and student engagement. However, the review also revealed a lack of research focusing on EFL postgraduate students' perceptions of using AI in thesis writing, especially within the Libyan higher education context. Therefore, this study aims to explore postgraduate students' perceptions of AI as a facilitating tool in thesis writing at the University of Zawia, focusing on its benefits and challenges.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter outlines the methodological framework employed in this research, detailing the systematic approach taken to investigate the research questions posed in the previous chapters. Methodology is fundamental to establishing the validity and reliability of the study's findings, as it ensures that the research design, data collection, and analysis procedures are appropriately aligned with the study's objectives.

This chapter presents the research design, the context of the study, the sampling procedures, the data collection instruments and procedures, providing a comprehensive overview of how the research was structured and implemented. In addition, it examines the pilot study conducted to refine the instruments, evaluates their validity and reliability to ensure accurate and consistent measurement, and addresses the ethical considerations adhered throughout the research process. The chapter also details the procedures used for data analysis. Finally, the chapter concludes with a summary of the main components discussed.

3.1 Research Design

A mixed-methods design was adopted for this study in order to obtain a comprehensive understanding of postgraduate students' perceptions of using artificial intelligence as a facilitating technological tool in thesis writing. Combining quantitative and qualitative methods allowed the researcher to collect broad, generalizable data through a questionnaire and to gain in-depth insights through semi-structured interviews. Creswell and Plano Clark (2007) notes that mixed-methods designs enable researchers to triangulate findings and increase the credibility of results, while Ritchie and Lewis (2003) argue that qualitative approaches provide rich contextual detail about participants' experiences. Thus, the mixed-methods approach was selected to balance breadth and depth in addressing the research objectives.

3.2 Context of the Study

The study was conducted in the English Department, specifically within the Applied Linguistics section, at the University of Zawia. The researcher's affiliation with the department played a significant role in facilitating access to postgraduate students and enabling effective communication with potential participants. Moreover, the department hosts a large population of postgraduate students who are actively engaged in academic research and are therefore likely to have prior experience with digital tools and technologies. This context was considered particularly suitable for investigating the role of artificial intelligence in thesis writing, as these students are expected to encounter and utilize AI-based tools during various stages of their research and writing processes.

3.3 Sampling

Sampling refers to the selection of participants who represent the population under study (Gay & Airasian, 2003; Dörnyei, 2007). This study employed purposive sampling to select postgraduate students who were most likely to have experience with AI tools and who could provide relevant insights related to the research questions. Purposive sampling was considered appropriate because the study targeted a specific subgroup, namely MA students in Applied Linguistics, rather than the entire university population.

3.4 Participants

The study targeted MA students enrolled in the English Department at the University of Zawia during the 2025–2026 academic year. Thirty questionnaires were distributed online, and forty-one (41) valid responses were received.

For the qualitative phase, five students who expressed willingness to participate in interviews were initially contacted and selected based on their availability and relevance to the study. Among the five volunteers, four were female and one was male. Their ages ranged from 29 to 39 years, and their experience in their field ranged from two to ten years. The predominance of female participants is not unexpected, as females constitute the majority of students in the English Department within the Libyan context.

3.5 Data Collection Instruments

This study employed two complementary instruments to collect quantitative and qualitative data. The questionnaire provided numerical data on students' perceptions and usage patterns of AI tools, while semi-structured interviews offered detailed accounts of students' experiences and attitudes. Using both instruments helped to compensate for the limitations of each method and contributed to producing more reliable and valid findings.

3.5.1 Questionnaire

The quantitative component relied on a structured questionnaire. Quantitative research focuses on the systematic and replicable measurement of variables and allows statistical analysis of responses (Dörnyei, 2007). A questionnaire was therefore considered an appropriate instrument for collecting standardized data from a relatively large number of participants in an efficient manner.

The questionnaire is one of the most widely used instruments in educational research because it enables researchers to collect large amounts of data within a relatively short period of time. According to Lavrakas (2008), a questionnaire is a standardized set of written questions designed to gather information from individuals about specific topics.

In this study, an online closed-ended questionnaire was designed to investigate students' beliefs, attitudes, and use of artificial intelligence tools in thesis writing. The questionnaire consisted of four main sections and employed a Likert-type scale to measure participants' levels of agreement with various statements (Ary et al., 2009). The use of closed-ended questions facilitated efficient data collection and supported statistical analysis.

Online questionnaires are considered practical and cost-effective because they allow researchers to reach participants quickly and organize responses electronically. Regmi et al. (2016) note that online questionnaires enhance accessibility and facilitate data management and statistical analysis. To enhance reliability, some items were reworded or repeated in different forms to check the consistency of participants' responses. The full questionnaire is presented in Appendix A.

Although questionnaires provide anonymity and encourage honest responses, they may have certain limitations, such as the possibility of misunderstanding questions or providing incomplete answers (Lavrakas, 2008). Therefore, semi-structured interviews were also conducted to gain deeper insights into participants' experiences.

3.5.2 Interview

Semi-structured interviews were conducted to collect qualitative data and explore participants' perceptions and experiences in greater depth. Qualitative data focus on understanding meanings, opinions, and interpretations that individuals attach to their experiences (Patton, 2002). Interviews are commonly used in educational research to obtain detailed information about participants' opinions, experiences, and attitudes.

According to Drever (1995), interviews are among the most frequently used research tools for exploring individuals' perspectives. This method allows participants to express their ideas freely and provides opportunities for follow-up questions, which help enrich the collected data.

Semi-structured interviews were conducted to obtain detailed qualitative information about participants' perceptions and experiences (Denscombe, 2010). The interview guide consisted of nine open-ended questions designed to encourage participants to elaborate on their views while allowing the discussion to develop naturally. The full list of interview questions is provided in Appendix B.

The researcher used clear and simple language when asking questions to ensure that participants fully understood them. Most interviews were conducted face-to-face, which helped build rapport with participants and create a comfortable environment for discussion. Face-to-face interviews also allowed the researcher to obtain richer and more confidential information that may not have been accessible through other data collection methods, such as questionnaires.

Interviews were conducted between the 5th and 16th of November 2025. Most interviews took place in a college café, while others were conducted via WhatsApp video call, depending on participants' convenience and availability. Each interview lasted approximately 25–30 minutes. With participants' permission, all interviews were

audio-recorded and later transcribed verbatim. The transcribed data were later analyzed using thematic analysis to identify recurring themes and patterns in participants' responses.

3.6 Validity and Reliability of the Research Instruments

Validity and reliability are fundamental components of educational research, as they determine the accuracy and consistency of the data collection instruments. Validity refers to the extent to which an instrument measures what it is intended to measure, whereas reliability relates to the degree to which the instrument produces stable and consistent results when applied under similar conditions (Cohen et al., 2007; Creswell, 2014). In this study, both validity and reliability were carefully considered to enhance the credibility of the research findings.

3.6.1 Validity

To ensure the validity of the research instruments, several procedures were followed. The questionnaire and interview questions were developed in accordance with the research objectives and guided by relevant literature. Different aspects of validity were addressed, including content validity, face validity, and construct validity.

With regard to content validity, the instruments were examined to confirm that all items adequately represented the scope of the study. The initial versions of the questionnaire and interview questions were reviewed by the supervisor and experts in the field. Their feedback was used to revise and refine the items, ensuring that they were clear, relevant, and comprehensive.

Face validity was also considered to ensure that the instruments appeared appropriate and understandable to the target participants. Experienced instructors reviewed the wording and structure of the items to assess their clarity and suitability. Based on their suggestions, modifications were made to improve the readability and overall presentation of the instruments.

Construct validity was addressed by designing the questionnaire items to reflect the theoretical concepts underpinning the study. Each item was linked to specific variables identified in the conceptual framework. In addition, piloting the instruments with a

small group of participants helped to identify ambiguous items and verify that the questions effectively measured the intended constructs.

3.6.2 Reliability

Reliability refers to the extent to which a research instrument yields consistent results over time. In the present study, the reliability of the questionnaire was evaluated using Cronbach's Alpha coefficient, which is commonly used to assess internal consistency in Likert-scale questionnaires. According to Gliem and Gliem (2003), Cronbach's Alpha measures the degree of interrelatedness among items within a scale and provides an indication of the instrument's reliability. Accordingly, Cronbach's Alpha was calculated to determine the consistency of participants' responses and to confirm the reliability of the questionnaire used in this study.

3.7 Pilot Study

A pilot study was conducted to evaluate the clarity, relevance, and practicality of the research instruments. Seven postgraduate students and MA instructors completed the questionnaire to assess the clarity of the items and the time required for completion, while three university instructors reviewed and provided feedback on the interview guide. Based on the feedback obtained from the pilot study, the questionnaire was reduced from fifty-five (55) items to thirty (30) items to enhance respondent engagement and reduce the completion time.

3.8 Data Collection Procedure

This section explains the procedures followed to collect the data for the study, including the preliminary steps taken before administering the research instruments. The data for this study were collected through two instruments: an online questionnaire and semi-structured interviews during the 2025–2026 academic year.

Before beginning the data collection process, the researcher prepared the research instruments and ensured that participants were clearly informed about the purpose of the study. Participants were also assured that their participation was voluntary and that their responses would remain confidential and used solely for academic research purposes. Based on the feedback from the pilot study, the questionnaire was refined to

improve clarity and reduce completion time, ensuring that the final instrument was both practical and easy for participants to complete.

The first stage of data collection involved distributing the questionnaire to postgraduate students enrolled in the English Department at the University of Zawia. The researcher contacted potential participants through WhatsApp, Messenger, and email, as many of them were colleagues in the same Master's program. An invitation message explaining the purpose of the study, the voluntary nature of participation, and the confidentiality of responses was sent to the participants along with a link to the online questionnaire created using Google Forms (see Appendix D). The questionnaire introduction provided additional context and instructions for completing the survey (see Appendix A).

The questionnaire consisted of four sections and required approximately twenty minutes to complete. The questionnaire remained open for eight days to allow participants sufficient time to complete it. A total of forty-one (41) valid responses were received and included in the analysis. The collected data were then entered into SPSS for statistical analysis.

After completing the questionnaire phase, participants were asked whether they would be willing to participate in follow-up interviews. Five students who expressed their willingness were contacted individually, and suitable interview times were arranged based on their availability.

The semi-structured interviews were conducted between the 5th and 16th of November 2025. Most interviews took place face-to-face in a college café to create a comfortable atmosphere that would encourage open discussion. However, some interviews were conducted via WhatsApp video calls depending on participants' convenience. Each interview lasted approximately 25–30 minutes.

Before starting each interview, the researcher again explained the purpose of the study and obtained participants' consent to record the conversation. All interviews were audio-recorded to ensure the accuracy of the collected data and were later transcribed verbatim for analysis.

The questionnaire responses were subsequently entered into SPSS for statistical analysis, while the interview transcripts were analyzed using thematic analysis to identify recurring patterns and themes in participants' responses.

3.9 Ethical Considerations

Ethical standards were observed throughout the research process. All participants received clear information about the aims and procedures of the study and provided informed consent before participating. Participants were also informed of their right to withdraw from the study at any time without penalty. To protect confidentiality, personal identifiers were removed from interview transcripts, and any reporting of results used pseudonyms or aggregated data. Permission to audio-record the interviews was obtained from all participants prior to the interviews. The researcher also ensured that participation involved no foreseeable risk to participants. All collected data were stored securely and used solely for research purposes in accordance with accepted academic ethical guidelines.

3.10 Data Analysis

The data collected in this study were analyzed using both quantitative and qualitative procedures in accordance with the mixed-methods research design adopted in this study.

The quantitative data obtained from the questionnaire were entered into the Statistical Package for the Social Sciences (SPSS) for statistical analysis. Descriptive statistical techniques were used to summarize and interpret the data. These techniques included frequencies, percentages, and mean scores, which were calculated to determine participants' levels of agreement with the questionnaire statements and to identify general trends in students' perceptions regarding the use of artificial intelligence in thesis writing. The results of the statistical analysis are presented and discussed in the findings chapter (see Appendix E for detailed SPSS output).

The qualitative data obtained from the semi-structured interviews were analyzed using thematic analysis. All interview recordings were transcribed verbatim to ensure the accuracy of the data. The transcripts were then read several times to achieve familiarity

with the data. Following this process, the researcher conducted an initial coding procedure to identify meaningful units within the data (Dörnyei, 2007; Bryman, 2012). Similar codes were subsequently grouped into broader categories representing recurring themes across participants' responses.

To enhance the accuracy and reliability of the analysis, the researcher repeatedly reviewed the interview transcripts during the coding process to ensure that the identified themes accurately reflected participants' responses. The qualitative data were then organized into several thematic categories related to the research questions, including awareness of AI-powered writing tools, motivation for using AI for academic writing, challenges and limitations of AI tools in thesis writing, and ethical considerations regarding their responsible use. These categories helped structure the analysis and provided a clear framework for interpreting participants' responses.

Finally, the qualitative findings were compared with the quantitative results to support the triangulation of data, thereby strengthening the credibility and comprehensiveness of the study. Direct quotations from interview participants were also included in the findings chapter to illustrate and support the interpretation of the qualitative data.

3.11 Summary of the Chapter

This chapter presented the research methodology, including the mixed-methods design, the study context, sampling procedures, instrumentation, pilot testing, ethical safeguards, and data analysis procedures. The combined use of a structured questionnaire and semi-structured interviews enabled the researcher to capture both the breadth and depth of postgraduate students' perceptions regarding the use of AI as a facilitating tool in thesis writing.

CHAPTER FOUR
DATA ANALYSIS AND RESULTS

4.0 Introduction

This chapter includes the procedures used for data analysis and the integration of both quantitative and qualitative findings. The quantitative data were collected through a questionnaire completed by forty-one MA postgraduate students in the Department of English at the University of Zawia. The qualitative data were obtained through semi-structured interviews conducted with five participants from the same department. Although a mixed-methods approach was applied, each type of data was analyzed individually. The chapter concludes with a summary of the chapter.

4.1 Analysis of the Questionnaire (Quantitative Data)

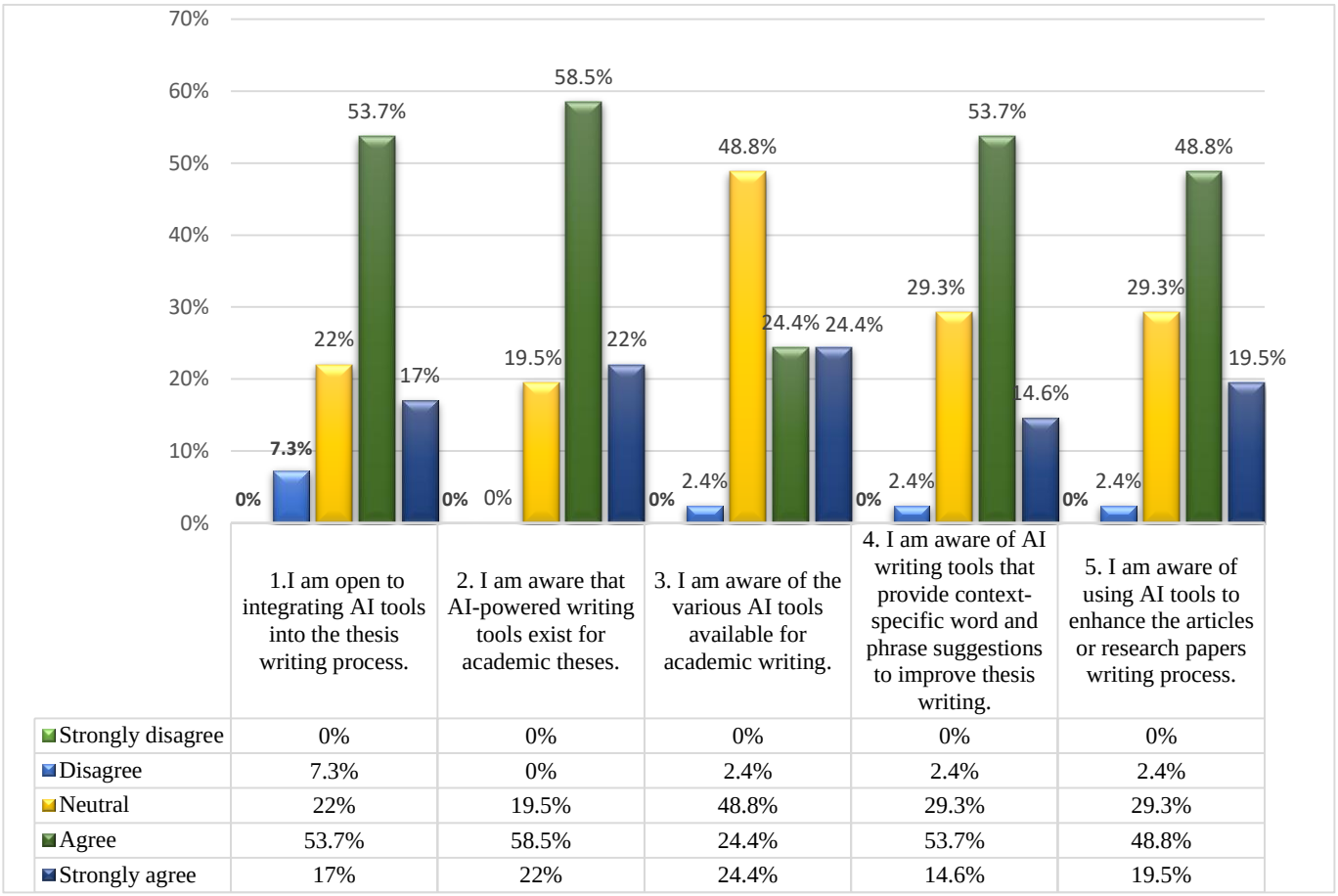
This section presents the analysis of students' responses to the questionnaire designed to address the research questions of the study. The questionnaire consisted of 30 statements focusing on students' perceptions of using artificial intelligence (AI) writing tools as supportive technological aids in thesis writing. A five-point Likert scale was employed to measure students' levels of agreement with each statement, ranging from strongly disagree to strongly agree.

The collected data were analyzed using descriptive statistical techniques to identify the general tendencies in students' responses. The analysis included the calculation of frequencies, percentages, means, and standard deviations, providing a clear quantitative description of participants' attitudes toward the use of AI tools in thesis writing.

To provide a comprehensible and organized presentation of the findings, the data analysis was structured according to the following categories: general awareness of AI tools in thesis writing, usage of AI tools, perceived benefits of AI, and challenges of using AI tools.

The results are presented in the following figures, which illustrate the extent to which students agreed or disagreed with each statement. For clarity of interpretation, the findings are organized according to thematic categories related to the role and effectiveness of AI writing tools in supporting thesis writing.

4.1.1 General Awareness of AI Tools in Thesis Writing



	1.I am open to integrating AI tools into the thesis writing process.	2. I am aware that AI-powered writing tools exist for academic theses.	3. I am aware of the various AI tools available for academic writing.	4. I am aware of AI writing tools that provide context-specific word and phrase suggestions to improve thesis writing.	5. I am aware of using AI tools to enhance the articles or research papers writing process.
Strongly disagree	0%	0%	0%	0%	0%
Disagree	7.3%	0%	2.4%	2.4%	2.4%
Neutral	22%	19.5%	48.8%	29.3%	29.3%
Agree	53.7%	58.5%	24.4%	53.7%	48.8%
Strongly agree	17%	22%	24.4%	14.6%	19.5%

Figure 4.1: Students' Responses Percentage Categories to Questionnaire Items of General Awareness of AI tools in thesis writing

Figure 4.1 presents the overall distribution of students' responses concerning general awareness of AI tools in thesis writing.With regard to the first statement on students' openness to integrating AI tools into their thesis writing, the findings reveal a generally positive attitude. More than half of the participants (53.7%) agreed, while a further 17% strongly agreed, indicating a clear willingness to adopt AI tools as part of their writing practices. In contrast, 22% selected the neutral option, reflecting some uncertainty or hesitation, whereas only 7.3% expressed disagreement. These results suggest that most students are receptive to incorporating AI tools into the thesis writing process.

The second statement explored students' openness to AI integration; their awareness of the existence of AI-powered writing tools. The results indicate a notably high level of awareness among the participants. Specifically, 58.5% of respondents agreed and 22% strongly agreed that they were aware of such tools, indicating that more than three-

quarters of the sample acknowledged their existence. However, 19.5% of the students selected the neutral option, suggesting a degree of uncertainty or limited familiarity despite general awareness. Notably, none of the participants disagreed with the statement. Overall, the findings demonstrate that awareness of AI-powered writing tools for dissertation and thesis writing is well established among postgraduate students.

In contrast, the third statement examined students' awareness of the variety of AI writing tools available. The results indicate a moderate level of uncertainty among the participants. Nearly half of the respondents (48.8%) selected the neutral response, suggesting limited knowledge or uncertainty regarding the range of existing tools. Meanwhile, equal proportions of participants (24.4%) agreed and strongly agreed that they were aware of various AI writing tools, while only 2.4% disagreed. The findings show that although awareness of AI tools existence is high, knowledge of the diversity of available tools appears less certain, highlighting the need for further training and exposure.

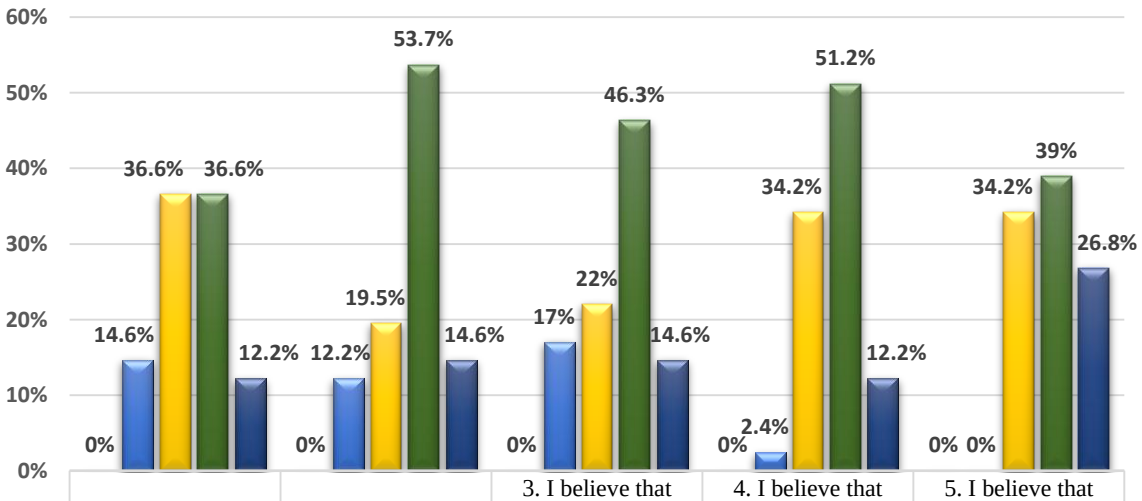
The fourth statement addressed students' awareness of AI writing tools that provide context-specific support. The results indicate a positive level of awareness, as 53.7% of respondents agreed and 14.6% strongly agreed with the statement. Nevertheless, 29.3% of the participants chose the neutral response, suggesting partial awareness or uncertainty regarding the specific capabilities of such tools. Only 2.4% disagreed, which implies minimal resistance or lack of awareness among the respondents. These findings indicate that the majority of students recognize the usefulness of AI tools in enhancing vocabulary selection and contextual accuracy in academic writing.

The fifth statement examined students’ awareness of using AI tools to improve article and research paper writing was examined. The findings reveal generally positive perceptions, as 48.8% of the participants agreed and 19.5% strongly agreed that AI tools can enhance academic writing. Meanwhile, 29.3% selected the neutral option, reflecting uncertainty or limited experience, and only 2.4% disagreed. Collectively, these results suggest that students largely view AI tools as beneficial supports for improving the quality and efficiency of research writing.

Overall, the findings indicate that students demonstrated a relatively high level of awareness regarding the existence of AI-powered writing tools for academic

purposes. The statement “I am aware that AI-powered writing tools exist for academic thesis writing” received the highest level of agreement, with 80% of participants either agreeing or strongly agreeing. In contrast, the statement “I am aware of the various AI tools available for academic writing” received the lowest level of agreement, as 51.4% of respondents selected the neutral option, indicating uncertainty or limited familiarity with the range of available tools. The remaining three statements—“*I am open to integrating AI tools in the thesis writing process*,” “*I am aware of AI writing helpers that provide context-specific word and phrase suggestions*,” and “*I am aware of using AI tools to enhance article or research paper writing*”—each recorded similar levels of agreement (51.4%). Building on this overview, it is noteworthy that no participant selected the “strongly disagree” option for any of the five items, indicating the absence of strong negative attitudes toward the use of AI tools in academic writing.

4.1.2 Usage of AI Tools



	1. I usually use AI tools during my thesis writing.	2. I believe that AI tools are easy to use.	3. I believe that AI applications and tools contribute to reducing errors and inaccuracies in academic writing theses.	4. I believe that using AI writing aids accurately understood and responded to writing theses prompts and requirements.	5. I believe that using AI positively will influence my willingness to use them in research thesis writing.
Strongly disagree	0%	0%	0%	0%	0%
Disagree	14.6%	12.2%	17%	2.4%	0%
Neutral	36.6%	19.5%	22%	34.2%	34.2%
Agree	36.6%	53.7%	46.3%	51.2%	39%
Strongly agree	12.2%	14.6%	14.6%	12.2%	26.8%

Figure 4.2: Students' Responses Percentage Categories of Usage of AI Tools in Thesis Writing

Figure 4.2 presents participants' responses regarding their actual use of AI tools during thesis writing. To provide a clearer understanding, the following subsections present a detailed analysis of each statement.

The first statement examined participants' reported frequency of AI tool usage. The results show that 36.6% of participants agreed and 12.2% strongly agreed that they usually use AI tools during their thesis writing, indicating that nearly half of the sample actively engages with AI-assisted writing practices. In contrast, an equal proportion of participants (36.6%) selected the neutral option, suggesting occasional or situational use rather than consistent reliance. Meanwhile, 14.6% disagreed, reflecting a smaller group who do not regularly use AI tools. These findings demonstrate a moderate but gradually increasing level of AI integration in thesis writing.

Following usage frequency, the second statement focused on students' perceptions of usability. A majority of participants perceived AI tools as user-friendly, with 53.7% agreeing and 14.6% strongly agreed that AI tools are easy to use. However, 19.5% remained neutral, and 12.2% disagreed. These findings indicate generally positive perceptions of usability, although a minority of the participants expressed uncertainty or difficulties in using them.

Moving beyond usability, the third statement investigated the effectiveness of AI tools in improving writing accuracy. The results reveal that a combined majority (60.9%) agreed or strongly agreed that AI tools help reduce errors and inaccuracies in thesis writing, highlighting their perceived role in enhancing language quality. Nonetheless, 22% selected the neutral option, and 17% disagreed, indicating some reservations regarding AI reliability. Despite these concerns, the overall trend reflects a generally positive perception of AI as a support tool for minimizing writing errors.

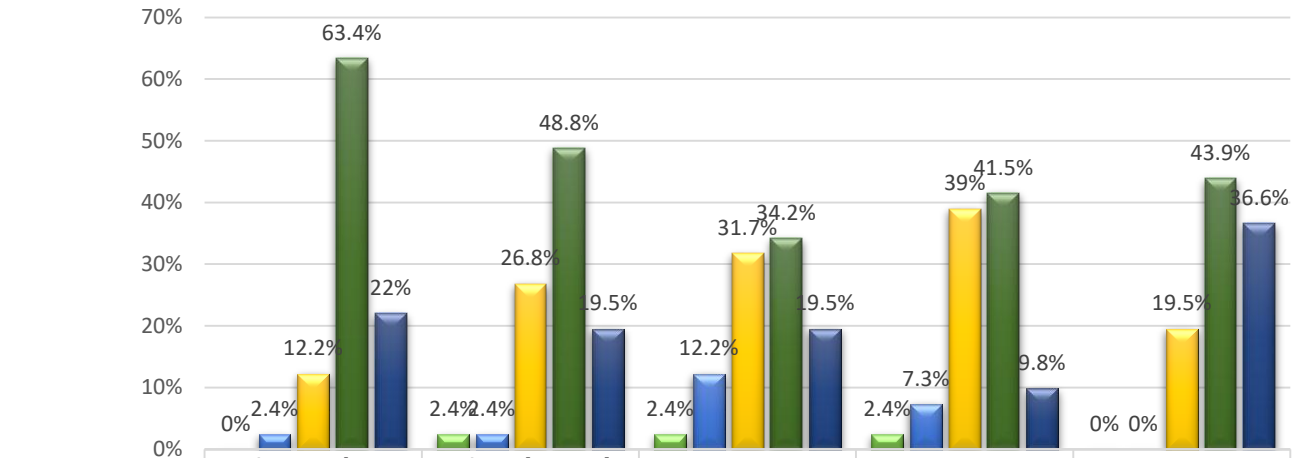
The fourth statement addressed AI tools' functional accuracy. The results show that more than half of the participants (51.2%) agreed and 12.2% strongly agreed that AI writing aids can accurately understand and respond to thesis prompts and academic requirements. Conversely, 34.1% selected the neutral option, suggesting uncertainty about AI's interpretative accuracy, while only 2.4% disagreed. These findings indicate that students generally trust AI tools' ability to align with academic writing expectations.

Finally, the fifth statement assessed participants' willingness to use AI tools in the future. The results show that 39% of respondents agreed and 26.8% strongly agreed that positive experiences with AI increase their willingness to use these tools in research thesis writing. Meanwhile, 34.2% selected the neutral option, suggesting cautious optimism or limited exposure. The findings indicate a generally positive inclination toward AI writing aids.

Overall, the findings indicate that positive attitudes toward AI significantly influence students' willingness to integrate these tools into their academic writing, accompanied by moderate levels of practical adoption. Nearly half of the participants (48.8%) reported that they usually use AI tools during thesis writing. A substantial majority perceived AI tools as easy to use (68.3%) and capable of accurately understanding and responding to thesis prompts (63.4%). Furthermore, 60.9% agreed that AI tools help reduce writing errors and inaccuracies, while 65.8% indicated that positive experiences with AI increased their willingness to use these tools in research thesis writing. Notably, no participant selected the "strongly disagree" option for any of the five items. Despite these favourable perceptions, actual usage remains comparatively moderate, suggesting a discrepancy between students' positive attitudes and their consistent application of AI tools in thesis writing.

4.1.3 Perceived Benefits of AI

Due to the number of items examined in this section, the results have been divided into two separate figures to enhance clarity and organization. Figure 4.3 presents students' responses to the first five statements related to the perceived benefits of AI in thesis writing, while Figure 4.4 illustrates the remaining five statements.



	1. AI can enhance your research capabilities by provide personalized feedback on editing and drafting, highlighting the areas that require improvement.	2. AI tools provide explanations that can improve writing quality by providing grammar and style suggestions, thereby enhancing the clarity and coherence of writing.	3. AI tools can help ensure originality by checking for potential plagiarism in thesis content.	4. AI can help automate citation and formatting tasks, ensuring adherence to specific guidelines.	5. AI tools like Grammarly helps to correct my grammar and punctuation in writing.
Strongly disagree	0%	2.4%	2.4%	2.4%	0%
Disagree	2.4%	2.4%	12.2%	7.3%	0%
Neutral	12.2%	26.8%	31.7%	39%	19.5%
Agree	63.4%	48.8%	34.2%	41.5%	43.9%
Strongly agree	22%	19.5%	19.5%	9.8%	36.6%

Figure 4.3: Students' Responses Percentage Categories of Perceived Benefits of AI

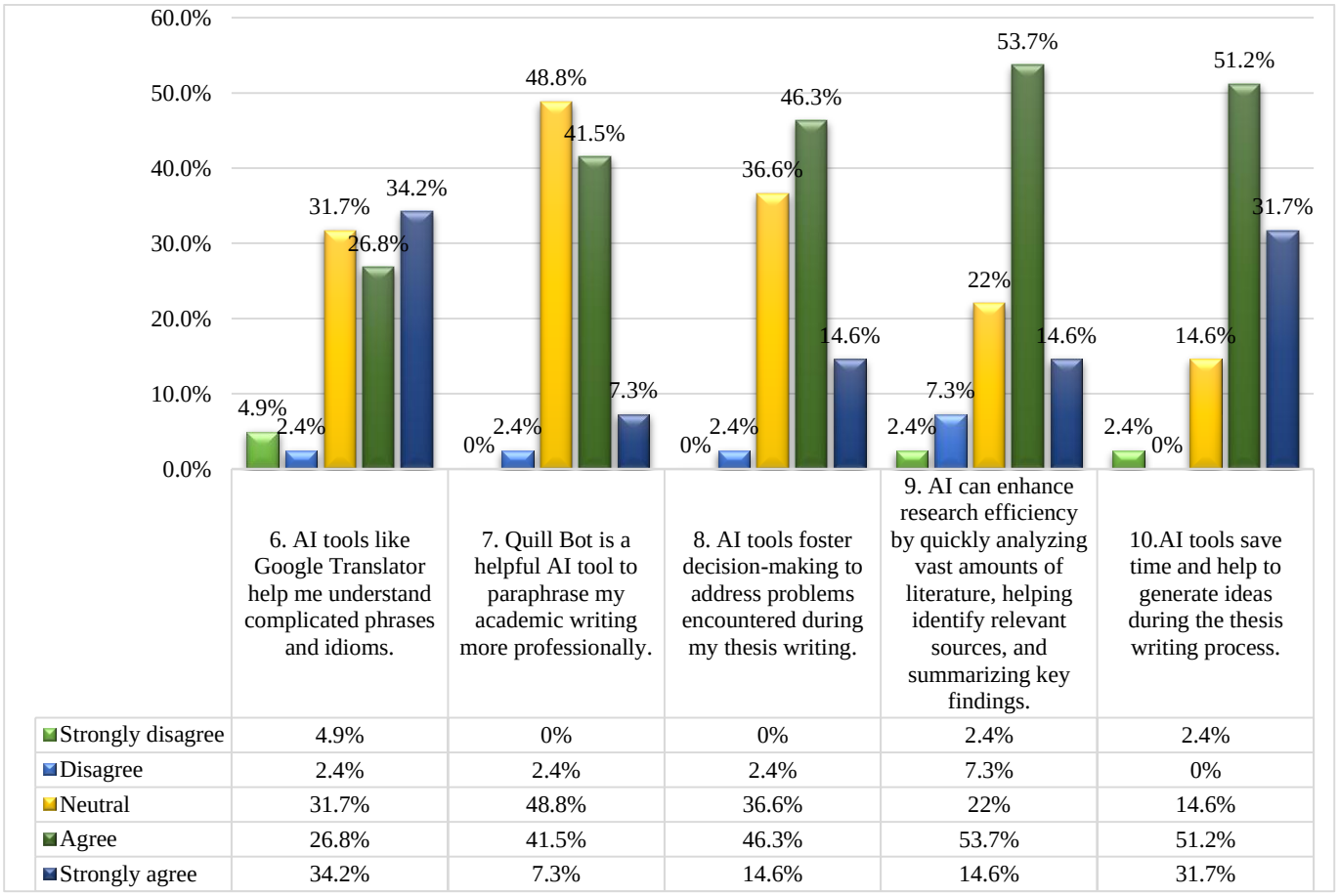
As can be seen in Figure 4.3, students expressed strong agreement regarding several linguistic and technical benefits of AI tools. The first statement indicates that personalized feedback is the most strongly perceived benefit. A large majority of participants (63.4% agreed and 22% strongly agreed) believed that AI enhances their research capabilities by providing individualized feedback during editing and drafting. Meanwhile, 12.2% remained neutral and only 2.4% disagreed. These findings clearly demonstrate that personalized feedback is one of the most valued features of AI tools.

Similarly, the second statement shows that students acknowledged the linguistic support provided by AI tools. Nearly two-thirds of respondents (48.8% agreed and 19.5% strongly agreed) reported that AI improves writing quality through grammar and style suggestions. Meanwhile, 26.8% were neutral, and 2.4% disagreed and 2.4% strongly disagreed. In terms of language improvement, this finding highlights AI's significant contribution to writing accuracy and coherence.

In relation to the third statement, more than half of the participants (34.1% strongly agreed and 19.5% agreed) believed that AI helps maintain academic integrity by detecting potential plagiarism. Meanwhile, 31.7% were neutral, 12.2% disagreed, and 2.4% strongly disagreed. As can be noticed, although agreement is dominant, a notable neutral percentage suggests some uncertainty regarding AI's reliability in plagiarism detection.

Regarding the fourth statement, over half of the participants (41.5% agreed and 9.8% strongly agreed) stated that AI can assist with citation and formatting requirements. Meanwhile, 39% were neutral, 7.3% disagreed, and 2.4% strongly disagreed. These results indicate moderate confidence in AI's ability to assist with referencing and formatting tasks.

The fifth statement indicates strong recognition of AI's role in correcting grammar and punctuation. A substantial majority (43.9% agreed and 36.6% strongly agreed) emphasized this benefit, while 19.5% remained neutral. This finding further confirms AI's important role in enhancing linguistic precision.



	6. AI tools like Google Translator help me understand complicated phrases and idioms.	7. Quill Bot is a helpful AI tool to paraphrase my academic writing more professionally.	8. AI tools foster decision-making to address problems encountered during my thesis writing.	9. AI can enhance research efficiency by quickly analyzing vast amounts of literature, helping identify relevant sources, and summarizing key findings.	10.AI tools save time and help to generate ideas during the thesis writing process.
Strongly disagree	4.9%	0%	0%	2.4%	2.4%
Disagree	2.4%	2.4%	2.4%	7.3%	0%
Neutral	31.7%	48.8%	36.6%	22%	14.6%
Agree	26.8%	41.5%	46.3%	53.7%	51.2%
Strongly agree	34.2%	7.3%	14.6%	14.6%	31.7%

Figure 4.4: Students' Responses to the Remaining Perceived Benefits of AI

While Figure 4.3 primarily focuses on linguistic accuracy and technical writing support, Figure 4.4 further highlights broader cognitive and research-related benefits, including comprehension, problem-solving, research efficiency, and idea generation.

The sixth statement shows that AI supports language comprehension. More than half of the participants (26.8% agreed and 34.1% strongly agreed) believed that translation tools assist in understanding complex phrases. Meanwhile, 31.7% were neutral, 2.4% disagreed, and 4.9% strongly disagreed**.** These findings suggest that AI supports students in navigating complex academic language.

Similarly, the seventh statement indicates that AI tools assist in professional paraphrasing. Nearly half of respondents (41.5% agreed and 7.3% strongly agreed) viewed tools such as QuillBot as helpful. However, 48.8% remained neutral and 2.4% disagreed**.** The relatively high neutrality suggests that while many students find paraphrasing tools helpful, others remain uncertain about their effectiveness.

In relation to the eighth statement, a majority (46.3% agreed and 14.6% strongly agreed) reported that AI helps them solve problems encountered during thesis writing. Meanwhile, 36.6% were neutral and 2.4% disagreed**.** These findings suggest that AI is widely regarded as a helpful problem-solving aid.

Regarding the ninth statement, a combined majority (53.7% agreed and 14.6% strongly agreed) stated that AI enhances research efficiency by assisting in literature analysis and summarization. Meanwhile, 22% were neutral, 7.3% disagreed, and 2.4% strongly disagreed**.** In terms of research productivity, this finding reflects strong confidence in AI's ability to streamline research processes.

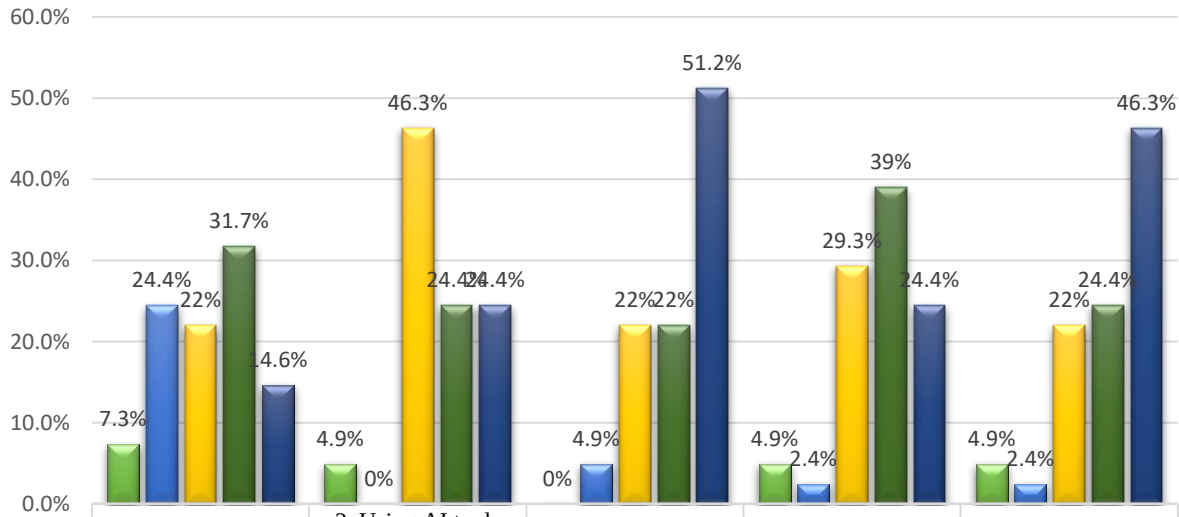
Finally, the tenth statement indicates that time-saving and idea generation are among the most emphasized benefits. More than four-fifths of participants (51.2% agreed and 31.7% strongly agreed) reported that AI increases efficiency and supports idea development. Meanwhile, 14.6% were neutral and 2.4% strongly disagreed. This result reinforces the overall positive perception of AI as a comprehensive academic support system.

Overall, the findings in Figures 4.3 and 4.4 clearly demonstrate that students perceive

AI tools as highly beneficial across multiple dimensions, including feedback provision, language improvement, academic integrity support, research efficiency, and time management. Particularly strong agreement regarding personalized feedback, grammar correction, idea generation, and research productivity indicates that AI is not viewed merely as an optional aid but as an integral component of the thesis-writing process. However, the presence of moderate neutrality in areas such as plagiarism detection, citation automation, and paraphrasing suggests that students may still question the reliability or full effectiveness of certain AI functions. Therefore, while AI is widely recognized as a powerful academic support tool, these findings also imply the need for structured guidance to maximize its responsible and effective use in higher education contexts.

4.1.4 Challenges of Using AI

To improve clarity and organization, the results in this section are presented in two separate figures. Figure 4.5 presents students' responses to the first five statements related to the challenges of using AI in thesis writing, while Figure 4.6 illustrates responses to the remaining five statements.



	1. I do not have knowledge on how to use AI tools effectively for my thesis writing.	2. Using AI tools raise ethical concerns in academic writing. They do not follow an accepted ethical guideline.	3. Relying too much on AI tools for my thesis writing may lead to over reliance.	4. Depending on AI tools leads to unintentional plagiarism and errors.	5. AI tools may hinder my personal writing skills, and intellectual development over time
Strongly disagree	7.3%	4.9%	0%	4.9%	4.9%
Disagree	24.4%	0%	4.9%	2.4%	2.4%
Neutral	22%	46.3%	22%	29.3%	22%
Agree	31.7%	24.4%	22%	39%	24.4%
Strongly agree	14.6%	24.4%	51.2%	24.4%	46.3%

Figure: 4.5: Students' Responses Percentage Categories of Challenges of Using AI

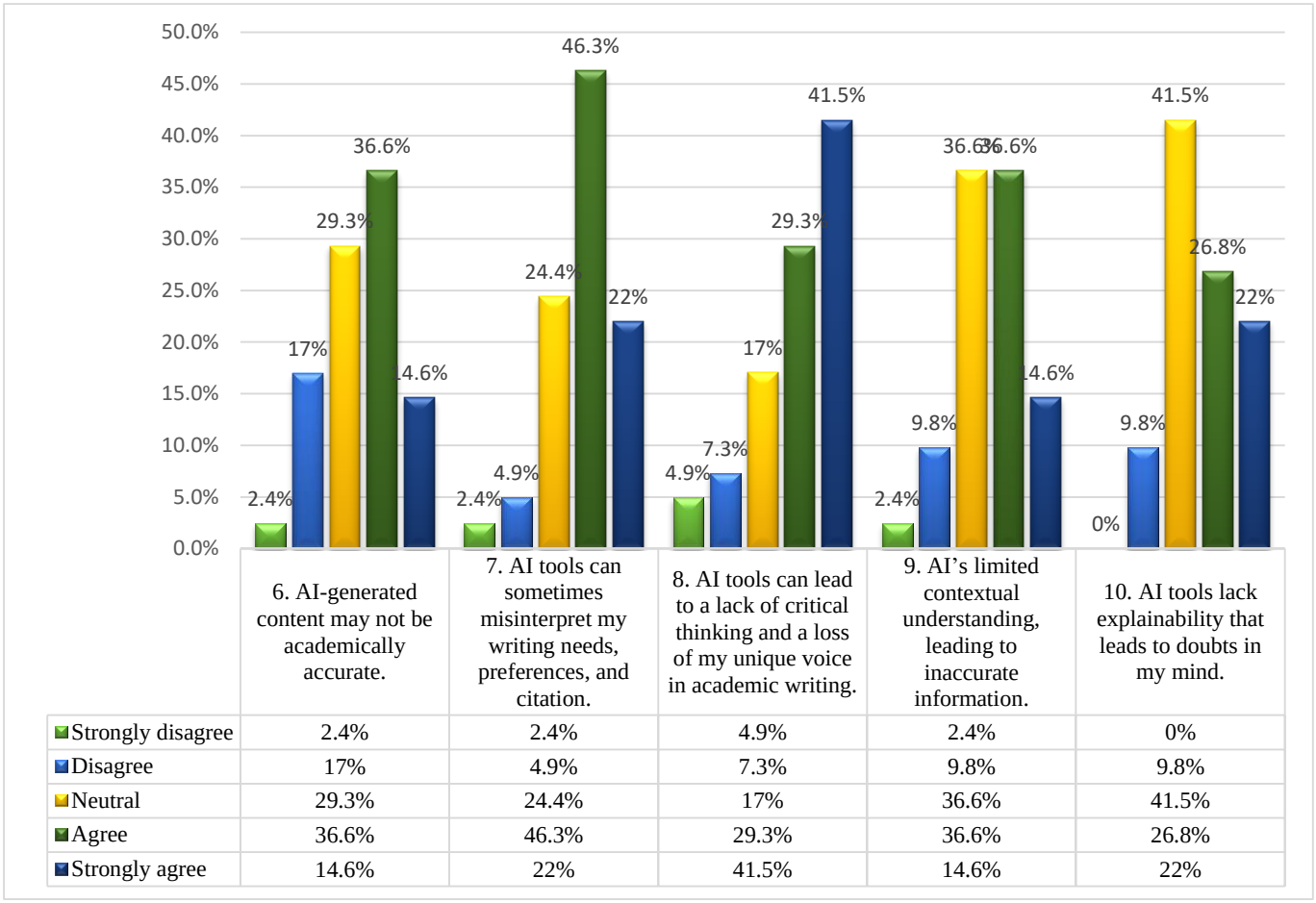
As can be seen in Figure 4.5, students reported several technical and ethical concerns regarding the use of AI tools in thesis writing. The first statement indicates that insufficient knowledge of how to use AI tools effectively represents a noticeable challenge. The results show that 31.7% agreed and 14.6% strongly agreed that they lacked the necessary skills to use AI appropriately. Meanwhile, 22% remained neutral. In contrast, 24.4% disagreed and 7.3% strongly disagreed, indicating that a notable group felt confident in their ability to use AI tools effectively.

Similarly, the second statement shows that ethical concerns emerged as an important issue. A combined 24.4% agreed and 24.4% strongly agreed that AI tools raise ethical concerns because they do not always follow accepted academic guidelines. At the same time, 46.3% remained neutral, reflecting uncertainty, while 4.9% strongly disagreed.

Regarding the third item, the findings reveal strong concern about over-reliance on AI tools. A substantial majority (22% agreed and 51.2% strongly agreed) expressed that excessive dependence on AI may lead to over-reliance. Meanwhile, 22% were neutral, and only 4.9% disagreed, indicating that very few students believed over-reliance would not be a problem.

In relation to the fourth statement, many students acknowledged the risk of unintentional plagiarism and errors. The results show that 39% agreed and 24.4% strongly agreed. In contrast, 29.3% remained neutral, while 2.4% disagreed and 4.9% strongly disagreed, indicating that only a small proportion perceived AI use as risk-free.

The fifth statement indicates concerns regarding the long-term impact of AI on personal writing skills and intellectual development. A large majority (24.4% agreed and 46.3% strongly agreed) believed that reliance on AI may hinder writing abilities and intellectual growth. Meanwhile, 22% remained neutral, whereas 2.4% disagreed and 4.9% strongly disagreed.



	6. AI-generated content may not be academically accurate.	7. AI tools can sometimes misinterpret my writing needs, preferences, and citation.	8. AI tools can lead to a lack of critical thinking and a loss of my unique voice in academic writing.	9. AI's limited contextual understanding, leading to inaccurate information.	10. AI tools lack explainability that leads to doubts in my mind.
Strongly disagree	2.4%	2.4%	4.9%	2.4%	0%
Disagree	17%	4.9%	7.3%	9.8%	9.8%
Neutral	29.3%	24.4%	17%	36.6%	41.5%
Agree	36.6%	46.3%	29.3%	36.6%	26.8%
Strongly agree	14.6%	22%	41.5%	14.6%	22%

Figure 4.6: Students' Responses to the Remaining Challenges of Using AI

Moving to Figure 4.5, the results continue to highlight academic and cognitive concerns associated with AI-assisted writing. While Figure 4.5primarily highlights technical skills, ethical considerations, and dependency-related concerns, Figure 4.6 further explores deeper academic and cognitive challenges, including issues of accuracy, contextual understanding, critical thinking, and transparency.

In terms of academic accuracy, the sixth statement shows that academic accuracy is a notable issue. A combined 36.6% agreed and 14.6% strongly agreed that AI-generated content may not always be academically accurate. Meanwhile, 29.3% remained neutral, while 17% disagreed and 2.4% strongly disagreed, indicating that a minority of students trusted AI outputs without reservation.

Similarly, the seventh statement indicates that AI tools may misinterpret students' writing needs, preferences, and citation requirements. The results demonstrate that

46.3% agreed and 22% strongly agreed with this concern. In contrast, 24.4% were neutral, while 4.9% disagreed and 2.4% strongly disagreed.

Regarding the eighth item, a significant proportion of students expressed concern about critical thinking and maintaining a unique academic voice. More than two-thirds (29.3% agreed and 41.5% strongly agreed) believed that AI tools could reduce critical thinking and weaken their writing style. Meanwhile, 17% remained neutral, while 7.3% disagreed and 4.9% strongly disagreed.

In relation to the ninth statement, students highlighted AI's limited contextual understanding. The results show that 36.6% agreed and 14.6% strongly agreed that limited contextual awareness may lead to inaccurate information. Additionally, 36.6% remained neutral, while 9.8% disagreed and 2.4% strongly disagreed, indicating moderate concern combined with substantial uncertainty.

Finally, the tenth statement shows that lack of explainability also raises concerns. Nearly half of the respondents (27.5% agreed and 22.5% strongly agreed) reported that limited transparency in AI tools creates doubts. Meanwhile, 40% remained neutral, and 10% disagreed.

Overall, the findings presented in Figures 4.5 and 4.6 demonstrate that although students acknowledge the usefulness of AI tools in thesis writing, they are highly aware of the associated risks and limitations. The results reveal that concerns extend beyond technical difficulties to include ethical uncertainty, over-reliance, risks of plagiarism, academic inaccuracy, and reduced critical thinking. Notably, high levels of agreement across several statements—particularly regarding over-reliance, intellectual development, and loss of critical thinking—suggest that students perceive AI not merely as a supportive tool but as a technology that may significantly influence their academic independence and cognitive growth. Furthermore, the large percentages of neutral responses in areas such as ethics, contextual understanding, and explainability indicate uncertainty and possible lack of clear institutional guidelines. Therefore, while AI is widely recognized as beneficial, these findings highlight the importance of developing proper training, ethical frameworks, and critical awareness to ensure its responsible and effective integration into academic writing practices.

4.2 Students' Interview

This section presents the qualitative findings obtained from semi-structured interviews with five postgraduate EFL students. The aim was to explore their perceptions, experiences, and concerns regarding the use of AI-powered writing tools during thesis writing. The interviews offered in-depth insights into how students interact with AI technologies and the ways in which these tools influence their academic writing practices.

All recorded interviews were transcribed verbatim and systematically analyzed using thematic analysis. The researcher coded the interview data to organize participants' responses into meaningful categories. Dornyei (2007) describes coding as the process of classifying data into distinct and conceptually relevant groups, which facilitates systematic interpretation.

Through this analytical process, several major themes emerged that reflect students' awareness, motivations, perceived benefits, challenges, and ethical concerns related to AI-assisted thesis writing. These themes capture both the supportive role of AI tools in academic writing and the reservations students hold regarding their use. To maintain the authenticity and credibility of the findings, the discussion is supported by direct quotations from participants. For confidentiality purposes, interviewees were identified using codes S1, S2, S3, S4, and S5, and detailed transcriptions are provided in Appendix C.

4.2.1 Awareness of AI-Powered Writing Tools

When postgraduate students at the University of Zawia were asked about their awareness of AI-powered writing tools for academic purposes, all participants confirmed their familiarity with such technologies.

S2 stated, *"AI-powered writing tools are becoming very common and are widely used to assist with academic work."* Similarly, S5 emphasized, *"They are quite common in academic work today."* S4 described AI as *"an effective tool,"* while S3 briefly confirmed familiarity with AI use in academic writing without providing further elaboration.

In contrast, S1 provided a more detailed explanation, noting that they had used multiple AI platforms and were able to distinguish between general writing-support tools and more specialized academic research applications. The participant further explained that such tools can be used at different stages of thesis writing, including literature review development and research synthesis.

The interview findings reveal that postgraduate students demonstrate a high level of awareness regarding the availability and use of AI-powered writing tools in academic contexts. All participants confirmed their familiarity with such technologies, indicating that awareness of AI tools is widespread among the sample. The repeated use of expressions such as *"very common"* and *"quite common"* reflects students' perception that AI technologies have become normalized components of academic writing support rather than unfamiliar or emerging innovations. This perception suggests that artificial intelligence is increasingly integrated into the academic environment in which students operate.

The findings also suggest that students' awareness is influenced by shared academic experiences and broader technological developments in higher education. The perception of AI tools as *"common"* indicates that students are regularly exposed to digital technologies within their academic context, reflecting the ongoing digital transformation of higher education. In this sense, technological literacy appears to be embedded within postgraduate academic practices rather than treated as an optional skill.

However, the interview data also reveal variation in the depth of awareness among participants. While some students, such as S1, demonstrated a more advanced understanding of AI applications and their potential use across different stages of thesis writing, others provided shorter and more general responses. Although these responses lacked detailed explanation, they still confirm consistent awareness of AI tools among all participants.

This variation suggest that awareness operates at different levels. For some students, awareness extends beyond simple recognition toward a more informed and strategic understanding of AI applications in academic writing. For others, it remains limited to general familiarity. These differences indicate that while exposure to AI tools is

widespread, the depth of engagement varies among postgraduate students. Awareness alone, therefore, does not necessarily ensure effective or critical use.

Overall, the findings demonstrate that awareness of AI-powered writing tools represents an important foundation influencing students' attitudes and patterns of AI use in academic writing. The widespread recognition of AI technologies suggests that postgraduate students are operating within an academic environment where digital writing assistance has become increasingly normalized. Nevertheless, the variation in the depth of awareness highlights the importance of academic guidance to help students develop responsible and strategic approaches to AI integration in scholarly writing.

Awareness of AI-powered writing tools among postgraduate students provides an important foundation for understanding their subsequent motivations for use. While familiarity establishes exposure to these technologies, it does not fully explain why students choose to integrate them into their thesis writing processes. Examining students' motivations for using AI tools therefore becomes necessary in order to understand how awareness translates into purposeful academic practice.

4.2.2 Motivation for Using AI for Academic Writing

Participants were asked about their motivation for using AI tools in thesis writing, several interconnected reasons emerged, particularly efficiency, productivity, clarity, and idea development.

S1 explained, *"My motivation is really about working smarter, not taking shortcuts… AI helps me brainstorm ideas quickly, organize my thoughts, and refine drafts faster."*

Similarly, S5 emphasized convenience and time management *"The main motivation is convenience. AI tools save time, help organize ideas, and make writing clearer."*

S3 highlighted flexibility and idea generation *"It's a flexible tool to use that provides many ideas about the subject… so it helps a lot."* In addition, S2 and S4 indicated that they were motivated to use AI because it is clear, easy to understand, and effective, particularly in improving academic outcomes and facilitating writing tasks.

The interview findings indicate that postgraduate students at the University of Zawia demonstrate strong motivation to use AI-powered writing tools. Their motivation is primarily driven by efficiency, productivity enhancement, clarity of expression, and support in idea generation. Across responses, students consistently positioned AI as a facilitating mechanism rather than a replacement for independent intellectual effort.

A central theme emerging from the data is optimization of academic work. S1's phrase *"working smarter, not taking shortcuts"* reflects a deliberate distinction between strategic assistance and academic avoidance. This wording suggests that students do not perceive AI as a means of bypassing effort, but rather as a tool that enhances cognitive organization and accelerates drafting processes. In this sense, AI functions as a strategic academic partner that enables students to manage complex thesis requirements more effectively.

Similarly, S5's emphasis on convenience and time-saving highlights the pragmatic dimension of AI motivation. Within the demanding context of postgraduate thesis writing—where students must balance research responsibilities, deadlines, and academic expectations—AI appears to operate as an efficiency-enhancing mechanism. The motivation is therefore rooted in productivity management rather than dependency.

Another significant theme relates to idea development and intellectual stimulation. S3's response illustrates how AI supports brainstorming and conceptual expansion. The description of AI as *"flexible"* and capable of providing *"many ideas"* suggests that students use it during stages of conceptual uncertainty or early drafting. In this respect, AI functions as a cognitive scaffold, assisting students in organizing theoretical perspectives, refining arguments, and overcoming writer's block.

Importantly, the data reveal that students maintain a clear awareness of intellectual responsibility. Their motivation reflects intentional, goal-directed engagement rather than passive reliance. AI does not generate knowledge independently; instead, it stimulates analytical engagement by offering alternative formulations and structural suggestions. This distinction between assistance and substitution is central to understanding students' motivational orientation.

Overall, the findings demonstrate that postgraduate students' motivation for using AI tools is pragmatic, strategic, and academically oriented. AI is therefore perceived as a supportive academic resource that enhances clarity, productivity, and idea development during the demanding process of thesis writing. Rather than diminishing intellectual effort, AI appears to optimize it, enabling students to produce structured and refined academic work while maintaining ownership of their learning process.

While students are primarily motivated by efficiency, productivity, and idea development, motivation alone does not fully capture the depth of their engagement with AI tools. Beyond pragmatic and performance-oriented reasons, participants also described important emotional and psychological dimensions associated with AI use. In particular, several students emphasized that AI contributes to reducing thesis-related stress and managing the anxiety often experienced during independent research. This emotional dimension extends the understanding of motivation by revealing that AI functions not only as a productivity-enhancing resource but also as a supportive mechanism that strengthens students' confidence and resilience during the thesis-writing process.

4.2.2.1 AI as a Tool for Reducing Thesis-Writing Anxiety

Beyond efficiency and idea generation, AI tools were described as significant in reducing thesis-writing anxiety. Based on students responses when they were asked whether AI tools help reduce thesis-writing anxiety, all of them acknowledged that AI plays an important emotional and psychological role during the writing process reduces stress by providing guidance, immediate feedback, and structured assistance throughout the research process

S1 explained, *"AI helps by breaking down these overwhelming tasks into manageable steps… Whether it is structuring chapters or paraphrasing dense literature, AI helps me tackle one piece at a time."* Similarly, S5 emphasized the stress-reducing function of AI, *"AI can provide guidance and clearer direction, which makes the writing process feel less overwhelming and reduces stress."*

S2 highlighted the importance of accessibility and continuous availability *"At 2 AM early morning, when no supervisor is available, AI feels like a tutor that guides me."*

Even brief responses reinforced this emotional dimension. S3 confirmed that AI *"reduces anxiety,"* while S4 stated that it *"helps a lot in reducing anxiety of academic writing."*

These findings reveal that AI tools function not only as cognitive aids but also as mechanisms for emotional regulation within the demanding context of thesis writing. A central theme emerging from the data is the reduction of cognitive overload. S1's description of AI breaking *"overwhelming tasks into manageable steps"* illustrates how AI contributes to structured task segmentation. By dividing complex academic responsibilities into smaller components, AI enhances students' perceived control over the writing process, thereby reducing anxiety associated with large-scale research projects.

Another significant theme relates to clarity and direction. S5's emphasis on *"guidance"* and *"clearer direction"* suggests that anxiety often stems from uncertainty and ambiguity during independent research. In this sense, AI appears to minimize confusion by providing immediate structural support. The immediacy of feedback reduces the temporal gap between confusion and clarification, which is frequently a major source of postgraduate academic stress. This rapid response mechanism strengthens students' sense of academic stability and confidence.

Accessibility also emerged as a crucial psychological factor. S2's comparison of AI to *"a tutor"* highlights the perception of AI as a continuously available academic assistant. In postgraduate contexts, where students often work independently and supervisors are not always immediately accessible, this constant availability reduces feelings of isolation. The presence of an accessible support system—even a digital one—appears to enhance students' autonomy while simultaneously lowering stress levels.

Although S3 and S4 provided shorter responses, their statements reinforce the consistency of this theme across participants. Even without detailed elaboration, their confirmation that AI reduces anxiety indicates that the emotional benefits of AI use are widely recognized among the sample.

Collectively, the findings suggest that AI operates simultaneously at both cognitive and affective levels. It supports task completion through organization and structuring while

also fostering emotional resilience by reducing uncertainty, isolation, and stress. Rather than merely accelerating writing productivity, AI appears to strengthen students' psychological capacity to manage the complex and often overwhelming demands of thesis writing.

AI contributes to reducing thesis-related anxiety by providing structure, clarity, and continuous support, the emotional benefits of AI use extend beyond stress reduction. As students begin to experience greater control over the writing process, this psychological stability gradually translates into increased academic confidence. In other words, the reduction of anxiety appears to create conditions that foster stronger self-belief in writing abilities. Therefore, examining how AI contributes to confidence building offers a deeper understanding of its role not only as a stress-management tool but also as a mechanism that supports academic growth and self-efficacy.

4.2.2.2 Confidence Building through AI Use

Confidence building also emerged as a significant outcome of AI use. Participants were asked whether AI enhances their confidence in academic writing, most reported positive effects, particularly in relation to vocabulary development, clarity of expression, and overall organization. S3 noted, *"the vocabulary that it uses is more formal and more academic, so it will be professional work."* Similarly, S5 explained, *"AI tools give helpful suggestions, improve clarity, and make the writing process smoother."*

S1 described AI as *"a personal writing coach… it's like having a writing coach that provides constant, detailed feedback."* While S4 claimed that *"Yes, of course. It has highly motivated me because it helps me produce professional work."*

In contrast, S2 provided a more reflective perspective, *"Yes, I feel confident after using AI tools, yet I know that real improvement comes from practicing."*

The findings indicate that AI use contributes significantly to students' confidence in academic writing. A central theme emerging from the data is linguistic enhancement. S3's emphasis on *"formal"* and *"academic"* vocabulary suggests that exposure to AI-generated language increases students' awareness of academic discourse conventions.

Through repeated interaction, students appear to internalize more professional stylistic norms, which strengthens their perception of producing higher-quality academic work.

Another important theme relates to clarity and structural organization. S5's reference to improved clarity and smoother writing reflects how AI assists in refining drafts and enhancing coherence. This process appears to reduce uncertainty about linguistic accuracy, thereby reinforcing students' confidence in their written output.

S1's metaphor of AI as a *"personal writing coach"* provides deeper insight into how confidence is developed. The idea of constant, detailed feedback suggests that AI facilitates iterative learning, where students revise, compare, and refine their work repeatedly. Such reflective revision practices are central components of academic writing competence. Through this continuous interaction, students engage in self-monitoring and gradual skill development, which contributes to sustained confidence growth.

Importantly, the data also reveal a strong element of metacognitive awareness. S2's acknowledgment that *"real improvement comes from practicing"* demonstrates a clear distinction between assisted performance and authentic skill acquisition. This indicates that students do not equate AI-supported writing with independent mastery. Instead, they recognize that AI serves as a supplementary tool rather than a substitute for personal effort.

Therefore, AI appears to function as a transitional support mechanism. It enhances confidence by improving vocabulary, clarity, and structural awareness while maintaining students' understanding of academic responsibility. Confidence building, in this sense, is not merely a result of linguistic correction but also of increased familiarity with academic discourse conventions. Through repeated exposure and guided refinement, students gradually strengthen their independent writing performance.

Overall, the findings suggest that AI contributes to both psychological assurance and academic skill development. Confidence gained through AI use is meaningful when combined with sustained personal engagement, reflective practice, and continued independent writing efforts.

4.2.3 Challenges and Limitations in Using AI Tools for Theses Writing

Despite the significant motivational and academic benefits associated with AI use, participants identified multiple challenges that complicate its effective integration into postgraduate thesis writing. These challenges extend beyond simple technical inconveniences and instead reflect deeper concerns related to epistemological reliability, academic dependency, privacy vulnerability, institutional ambiguity, and ethical responsibility.

Regarding reliability, S1 stated, *"Sometimes LLMs hallucinate facts or even cite papers that don't exist… extensive fact-checking is absolutely non-negotiable."* Similarly, S5 explained, *"Sometimes the information is wrong or outdated, so I have to double-check everything myself."*

Concerns about overreliance were also articulated. S3 expressed that excessive use of AI may weaken independent academic skills, while S4 warned against, "*copying and pasting,"* emphasizing that such practices could negatively affect originality and authentic argument development.

Privacy and data security emerged as another major concern. S1 reported proactive protective strategies *"I prioritize AI platforms with strong data protection policies… I never input truly sensitive or confidential thesis data, and I regularly delete conversation histories."*

S5 insisted about a personal responsibility, *"I use trusted platforms, avoid sharing sensitive personal information, and keep copies of my work on my own device."*

However, not all participants demonstrated the same level of awareness. S2 admitted,

"Honestly, I'm not sure about the privacy part," while S3 stated, *"I'm not really sure, but I'm concerned about my privacy."*

Institutional ambiguity was also highlighted, S5 noted, *"We don't have enough workshops or classes to show how to use AI in academic writing, most of what I learned is by myself."* S2 reinforced this concern, *"There are no clear rules from the university, so everyone uses AI in their own way and hopes it is acceptable."*

Furthermore S1 emphasized the need for structured guidance, *"Using AI ethically requires guidance… structured training would help students understand what is acceptable and how to use AI responsibly."*

The findings indicate that postgraduate students' engagement with AI tools is reflective and evaluative rather than uncritical. A central theme emerging from the data is epistemological reliability. Participants demonstrated clear awareness that AI-generated content may contain fabricated, inaccurate, or outdated information. S1's reference to *"hallucinate facts"* reflects sophisticated digital literacy, as the participant recognizes this limitation as a systemic characteristic of large language models rather than a rare error. The phrase *"absolutely non-negotiable"* signals that verification is perceived as a mandatory scholarly responsibility. In this sense, AI does not reduce academic rigor; instead, it increases the burden of critical evaluation and cross-referencing with credible sources.

A second major theme concerns academic dependency and cognitive autonomy. Students expressed concern that excessive reliance on AI may weaken independent reasoning, originality, and higher-order thinking skills. The warning against *"copying and pasting"* reflects awareness that intellectual ownership must remain with the student. These reflections demonstrate recognition that academic competence develops through sustained cognitive effort. AI, if misused, may risk interfering with deep analytical processing required in postgraduate scholarship.

Privacy and data security represent another complex challenge. The data reveal uneven levels of digital literacy among participants. While some students actively implement protective strategies—such as avoiding sensitive data input and maintaining local backups—others expressed uncertainty regarding privacy mechanisms. The coexistence of proactive risk management and informational gaps highlights inconsistencies in digital awareness across participants. This variation suggests the absence of systematic institutional training on safe and responsible AI engagement.

Institutional ambiguity further complicates AI integration. Participants consistently reported limited formal guidance, workshops, or clear university policies regulating AI use in academic writing. The absence of structured frameworks creates ethical uncertainty, where students rely on personal judgment rather than standardized

academic regulations. Such ambiguity may contribute to inconsistent practices and heightened anxiety regarding what constitutes acceptable use.

Technical issues were also noted, including system errors, and unstable internet connectivity. Although these challenges may appear minor, they affect workflow continuity and research productivity. Importantly, participants demonstrated adaptability by employing troubleshooting strategies and backup mechanisms, indicating active technological management rather than passive reliance.

Overall, the findings suggest that AI adoption in postgraduate thesis writing involves a continuous negotiation between perceived usefulness and perceived risk. Students consciously weigh the academic benefits of AI against concerns related to accuracy, dependency, privacy, and ethical responsibility. Effective AI integration therefore requires not only personal initiative and critical awareness but also structured institutional support, formal training, and transparent policies. Universities play a crucial role in providing ethical frameworks and digital literacy guidance to ensure responsible, consistent, and academically sound AI use.

4.2.4 Ethical Considerations and Responsible Use of AI in Theses Writing

Ethical responsibility emerged as a dominant and consistently emphasized theme across all student interviews. This consistent emphasis indicates that ethical awareness is not peripheral but central to students' engagement with AI tools in academic contexts. Participants did not approach AI as a neutral technology; rather, they framed its use within clear moral and scholarly boundaries.

Participants repeatedly highlighted the importance of maintaining academic integrity, preserving originality, and ensuring that human judgment remains central to the thesis writing process. S3 clearly stated, *"AI is a tool, not the author."* While S4 explained,

"I only use AI to improve my grammar and make my sentences clearer, but the ideas must be mine. Otherwise, it will not be my research."

S1 warned against excessive dependence, *"If you depend on AI to write everything, you are not really learning. You may finish the thesis, but you will lose your own academic ability."* Moreover, S2 emphasized the importance of verification *"We must always*

check the information given by AI and use real academic references, not just trust what it writes."

S5 concluded with a strong accountability statement, *"Even if AI helps you, the supervisor will ask you, not the computer. So you are responsible for everything in your thesis."*

Ethical responsibility emerged as a dominant and consistently emphasized theme across all interviews. The uniformity of responses indicates that ethical awareness is not peripheral but central to students' engagement with AI tools. Participants did not approach AI as a neutral or autonomous authority; rather, they framed its use within clear moral and scholarly boundaries.

A central theme is the distinction between assistance and authorship. S3's concise statement, *"AI is a tool, not the author,"* encapsulates this boundary clearly. Students consistently reinforced the principle that intellectual ownership must remain with the researcher. AI may support linguistic refinement or structural organization, but conceptual development and argument construction must originate from the student. This boundary-setting reflects conscious regulation rather than uncritical reliance.

Another key theme concerns originality and idea ownership. S4's emphasis that *"the ideas must be mine"* demonstrates students' commitment to maintaining intellectual authenticity. The separation between grammar support and conceptual contribution reveals an awareness of the difference between linguistic assistance and academic authorship. In this sense, AI indicate as a technical aid rather than a knowledge producer.

Long-term academic development also emerged as an ethical concern. S1's warning that overdependence may result in the loss of academic ability highlights awareness of potential developmental consequences. Students recognize that thesis writing is not only a product-oriented task but also a formative learning process requiring cognitive effort and critical thinking. Excessive AI reliance may undermine the gradual acquisition of higher-order scholarly skills.

Verification and source credibility represent another important ethical dimension. S2's insistence on checking AI-generated information and using real academic references reinforces the principle that AI outputs require rigorous human evaluation. Ethical AI use, therefore, involves continuous oversight, cross-referencing, and critical validation. AI does not replace scholarly judgment; instead, it increases the responsibility for careful scrutiny.

Personal accountability was strongly emphasized. S5's statement that *"the supervisor will ask you, not the computer"* underscores the ultimate responsibility borne by the student. Regardless of technological assistance, accountability for accuracy, originality, and scholarly validity remains with the researcher. This perspective reflects mature academic awareness and recognition of professional responsibility.

Collectively, these findings demonstrate that postgraduate students approach AI integration with conscious deliberation rather than passive acceptance. Their responses reveal a balanced ethical stance in which innovation is embraced within clearly defined academic limits. Students perceive AI as a supportive academic tool but not a substitute for intellectual effort, critical reasoning, or scholarly ownership.

Overall, the data indicate that EFL postgraduate students at the University of Zawia exhibit a high level of ethical awareness regarding AI use in thesis writing. They recognize that responsible integration requires originality, verification, transparency, and personal accountability. This ethical positioning suggests that students are not only technologically adaptive but also academically conscientious, reinforcing the importance of embedding AI use within a structured framework of academic integrity and responsible scholarly practice.

4.3 Summary of the Chapter

This chapter presented, analyzed, and interpreted the data collected through questionnaires and semi-structured interviews. The questionnaire results revealed that most participants demonstrated a high level of awareness regarding the existence of AI-powered writing tools for academic purposes. Additionally, students expressed a generally positive perception of the benefits of AI in supporting thesis writing.

Findings from the semi-structured interviews further indicated that postgraduate students view AI as a valuable academic support tool that enhances productivity, learning, and confidence. At the same time, participants emphasized the importance of ethical use, institutional guidance, and responsible integration. These results suggest that, with appropriate policies and training, AI can be effectively and responsibly incorporated into postgraduate academic writing.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.0 Introduction

This chapter discusses the major findings of the study in relation to the literature reviewed in chapter two. The purpose of the discussion is to interpret the results, explain their significance, and highlight areas of agreement and divergence between the current study and previous research.

Additionally, conclusion, study limitations and recommendations for future research are provided.

5.1 Discussion

This chapter discusses the findings of the study in relation to the research questions (see 1.4). To evaluate the implications of the results and draw conclusions, the findings are connected to the previous studies reviewed in Chapter 2.

5.1.1 Research Question 1

How do EFL postgraduate students at the University of Zawia perceive the usefulness of Artificial Intelligence tools in their theses writing?

The findings addressing this question indicate that EFL postgraduate students at the University of Zawia generally hold positive perceptions toward the usefulness of artificial intelligence (AI) tools in the thesis writing process. The results reveal that students view AI applications as supportive academic resources that contribute to improving writing quality, enhancing language accuracy, and facilitating writing tasks through immediate feedback and technical assistance. These findings are consistent with the study conducted by Roberts (2019), which found that students perceived AI-powered writing assistants as productivity-enhancing tools that improved overall writing quality.

The questionnaire findings further demonstrate that students possess a moderate to high level of awareness regarding AI tools and their academic functions. Although

participants reported limited familiarity with the wide range of available AI platforms, they acknowledged the effectiveness of AI tools in providing context-appropriate vocabulary suggestions, assisting research writing, and supporting academic language development. Similar findings were reported by Chen and Gong (2025), who concluded that AI-assisted writing tools significantly enhanced academic performance and learner motivation among CSL students. Likewise, Winarti et al. (2025) found that AI technologies improved grammatical accuracy, idea organization, and argument development among EFL students writing thesis proposals. The alignment between these studies and the present findings suggests that AI tools function as practical academic supports across different linguistic and educational contexts.

Furthermore, interview findings revealed that students perceive AI tools not merely as optional technological aids but as practical academic supports that enhance writing efficiency and performance. These findings can be interpreted in relation to previous research that highlights the role of artificial intelligence in facilitating personalized learning and adaptive academic support. The results align with the work of Luckin et al., (2016) who emphasize that AI-based systems enhance learning outcomes by providing real-time feedback and individualized instructional support. The consistency between the present findings and earlier research suggests that postgraduate students, similar to students examined in previous studies, benefit from AI-generated feedback that strengthens writing competence.

Another significant benefit identified students' perceptions of AI usefulness appear to be strongly influenced by their evaluation of usability and functional reliability. A considerable proportion of participants reported that AI tools are easy to use, capable of interpreting thesis prompts, and effective in minimizing grammatical and structural errors. This relationship between perceived usefulness and technology adoption can be explained through the framework proposed by Davis (1989), which identifies perceived usefulness as a primary determinant of users' willingness to adopt new technologies. Similarly, Teo (2019) argues that students' acceptance of educational technologies is largely influenced by their perceptions of academic benefits and ease of use. The findings of the present study support these theoretical perspectives, as positive experiences with AI tools were found to increase students' intention to use such technologies in future academic writing tasks.

In addition, the positive perceptions identified in this study correspond with research examining students' attitudes toward AI integration in higher education. For instance, Rodafinos (2025) reported that generative AI tools enhanced students' efficiency in literature reviews, research question formulation, and thesis organization. Similarly, Saad et al. (2025) emphasized that AI tools improve writing clarity and academic rigor, particularly among non-native English speakers. Within the Libyan context, Alnaass and Jamoom (2025) found that AI tools provide immediate feedback and structural guidance that enhance writing instruction. The present study extends these findings by demonstrating that postgraduate students themselves perceive AI as beneficial in thesis writing.

Moreover, Audrain et al., (2021) found that AI-supported learning environments enhance students' motivation and academic engagement when students perceive the technology as reliable and academically beneficial. Similarly, Scherer et al. (2016) suggest that students' prior experiences with educational technologies and their perceptions of academic value significantly influence technology acceptance. The present findings extend these conclusions by demonstrating that postgraduate students perceive AI tools as effective academic supports rather than merely technical conveniences.

Despite the generally positive perceptions, the findings reveal that students' actual usage of AI tools remains moderate. This observation differs slightly from some international studies where AI use was more systematically integrated into coursework. The moderate usage identified in the current study may be attributed to limited institutional training, infrastructural constraints, and uncertainty regarding responsible AI practices. Therefore, while the findings align with previous research regarding perceived usefulness, they also highlight contextual factors that influence the extent of practical implementation within the Libyan postgraduate environment.

This indicates that although students recognize the usefulness of AI technologies, several factors may influence the extent of their practical implementation. Limited formal training, insufficient awareness of available AI tool diversity, and concerns regarding responsible usage appear to restrict full integration into thesis writing practices. This observation is consistent with the findings of Scherer et al. (2016), which suggest that students' technology adoption often develops through informal exposure

rather than structured institutional training. Moreover, previous research highlights that institutional guidance and targeted training programs significantly enhance the effective and ethical use of AI tools in postgraduate academic writing.

Overall, the findings demonstrate that EFL postgraduate students at the University of Zawia perceive AI tools as beneficial academic resources that enhance writing quality, linguistic accuracy, and learning efficiency. These perceptions appear to be shaped by both direct functional experiences and broader awareness of AI's academic value. While the findings are consistent with international research and established technology acceptance theories, they also highlight the need for structured training programs and institutional support to ensure effective and responsible AI integration in postgraduate education.

5.1.2 Research Question 2

What are the perceived benefits and challenges of using Artificial Intelligence in their theses writing?

The findings addressing this question indicate that EFL postgraduate students at the University of Zawia perceive artificial intelligence (AI) tools as offering both significant academic benefits and notable challenges during the thesis writing process. The results demonstrate that students recognize AI writing tools as supportive resources that enhance linguistic accuracy, organization, and writing confidence. However, participants simultaneously expressed concerns related to accuracy, ethical implications, and the potential risk of overdependence on technological assistance.

With regard to perceived benefits, the findings reveal that AI tools play a substantial role in improving academic writing quality. Students reported that AI-assisted applications effectively support grammar correction, punctuation, academic vocabulary selection, sentence clarity, and organization of ideas. These findings are particularly significant for EFL postgraduate students, who often encounter linguistic challenges when producing academic writing in English. The present findings support previous research conducted by Coenen et al. (2021) and Fitria (2021), which demonstrate that AI-powered writing tools enhance linguistic accuracy, coherence, and overall writing quality. The consistency between the current findings and earlier studies suggests that

AI tools provide effective linguistic scaffolding that supports postgraduate academic writing development.

In addition to improving writing quality, students perceived AI applications as efficient and time-saving academic resources. Participants reported that AI tools reduce the time required for revising, editing, paraphrasing, and language checking, allowing them to manage thesis writing tasks more effectively. These findings align with research conducted by Nazari et al. (2021), which highlights the role of AI applications in increasing academic productivity by automating repetitive and time-consuming writing tasks. Similarly, Bensalem et al. (2024) reported that students perceived AI tools as efficient and supportive in completing assignments. Previous research suggests that automated feedback systems allow students to focus more on conceptual content development and analytical thinking while reducing the cognitive burden associated with mechanical language corrections.

Another significant benefit identified in this study is the contribution of AI tools to idea generation and academic organization. Students reported that AI applications assist in brainstorming ideas, restructuring paragraphs, organizing arguments, and clarifying complex academic concepts. These results correspond with the findings of Sumakul et al. (2022), who argues that AI technologies support cognitive learning processes by providing structured guidance while still requiring active student engagement. This interpretation reflects constructivist learning principles, which emphasize students' interaction with learning tools as a means of developing knowledge and academic competence.

Accessibility and ease of use also emerged as important advantages influencing students' perceptions of AI tools. Participants highlighted that AI applications are readily accessible, user-friendly, and require limited technical expertise, which promotes student independence during thesis writing. These findings support research conducted by Ali (2020) and Cotton et al. (2023), which suggests that AI tools function as facilitating technological resources that help postgraduate students overcome common academic writing difficulties.

Despite the numerous benefits reported, students also identified several challenges associated with AI use in thesis writing. One of the primary concerns relates to the

accuracy and reliability of AI-generated content. Participants reported that AI tools occasionally produce inaccurate information, weak paraphrasing, or unclear academic explanations, requiring careful human evaluation and verification. Similar concerns were identified by Chen and Gong (2025), who reported occasional inaccuracies in AI-generated academic content. Additionally, Gee (2018) emphasized the necessity of critical evaluation when using AI tools in academic contexts.

Another significant challenge highlighted by participants is the risk of overdependence on AI applications. Students expressed concerns that excessive reliance on AI technologies may weaken independent writing abilities and limit the development of critical thinking skills. This perception corresponds with previous research conducted by Baker and Siemens (2014), which cautions that excessive dependence on automated learning technologies may negatively influence the development of higher-order academic skills. The present findings therefore suggest that although AI tools support writing performance, balanced usage remains essential to maintain students' intellectual independence.

Furthermore, participants reported technical and infrastructural challenges that influence AI adoption. These challenges include unstable internet connectivity and limitations in AI tool functionality, which restrict consistent use during the thesis writing process. This observation is consistent with findings reported by Audrain et al. (2021), who highlight the importance of technological infrastructure in determining the effectiveness of AI integration in higher education environments.

Ethical concerns and issues related to academic integrity also emerged as influential factors shaping students' perceptions. Participants expressed uncertainty regarding acceptable AI use, plagiarism risks, and authorship boundaries, which increased caution and anxiety when using AI tools in academic writing. These findings align with the Qadir (2023) and Saad et al. (2025), who emphasizes the need for ethical awareness and institutional guidelines to regulate responsible AI integration in academic contexts. Previous research suggests that universities must establish clear policies that balance technological innovation with academic integrity standards.

Overall, the findings indicate that EFL postgraduate students perceive AI tools as valuable academic supports that enhance writing quality, productivity, idea

development, and student autonomy. These benefits strongly correspond with existing literature emphasizing AI's role in improving academic writing and efficiency. Nevertheless, consistent with previous research, students also identified challenges related to accuracy, ethical considerations, overdependence, and technological limitations. These findings highlight the importance of balanced AI integration supported by institutional training, technological infrastructure, and academic supervision to maximize the educational benefits of AI tools in postgraduate thesis writing.

5.2 Conclusion of the Whole Study

The present study aimed to investigate the role of artificial intelligence tools in supporting postgraduate students during the thesis writing process at the University of Zawia. Specifically, it sought to explore students' perceptions of AI use, the benefits they experience, and the challenges they encounter while integrating these tools into academic writing.

To achieve this aim, a mixed-methods approach was adopted. Quantitative data were collected through a structured questionnaire administered to postgraduate students, while qualitative data were obtained through semi-structured interviews. This combination of methods allowed for a comprehensive understanding of students' experiences and provided both statistical trends and in-depth insights into their views.

The findings revealed that most students hold positive attitudes toward the use of AI tools in thesis writing. Participants reported that AI applications help them improve language accuracy, organize ideas more clearly, and complete writing tasks more efficiently. Moreover, many students indicated that AI tools reduce writing anxiety and increase their confidence when producing academic texts. However, the results also highlighted several concerns, particularly regarding the accuracy of AI-generated content, issues of academic integrity, data privacy, and the risk of becoming overly dependent on technology.

In conclusion, artificial intelligence tools can be considered valuable supportive resources in postgraduate thesis writing at the University of Zawia. Nevertheless, their use should remain guided by ethical standards and informed human judgment. AI

should function as an assisting tool that enhances students' academic performance, rather than replacing their critical thinking, originality, and scholarly responsibility.

5.3 Limitations of the Study

This study was conducted with a limited sample of postgraduate students from a single institution, namely the University of Zawia, which may restrict the generalizability of the findings to postgraduate students in other universities or educational contexts. In addition, the study relied on self-reported questionnaire and interview data, which may be influenced by participants' personal perceptions, recall bias, or socially desirable responses.

Furthermore, the scope of the study was limited to investigating postgraduate students' perspectives and experiences with using artificial intelligence writing tools during the thesis writing process. The views of thesis supervisors, examiners, and academic administrators—who play an essential role in guiding and evaluating thesis writing—were not included. Finally, although ethical concerns related to AI use were acknowledged, the study did not provide a detailed analysis of institutional policies or academic integrity regulations across different faculties or universities.

5.4 Recommendations

Based on the findings and conclusions of the study, several recommendations can be proposed to enhance the effective and responsible use of artificial intelligence tools in postgraduate thesis writing. The results demonstrated both the benefits and challenges associated with AI integration in academic writing, which highlights the need for clear guidance, institutional support, and informed student practices. Accordingly, this study offers a set of recommendations directed to postgraduate students, as well as to universities and faculties, with the aim of promoting ethical, efficient, and pedagogically sound use of AI technologies in higher education.

For Postgraduate Students

- Use AI tools as supportive instruments, not replacements for academic thinking and writing.

- Maintain academic integrity by clearly understanding which AI-assisted practices are acceptable.
- Regularly consult supervisors when using AI tools to avoid misuse.
- Use AI tools as supportive aids, not substitutes for critical thinking.
- Apply AI to enhance originality, not to replace it.
- Learn proper citation techniques to avoid unintentional plagiarism.
- Always cross-check AI-generated information, such as citation and references.

For Universities and Faculties

- Develop clear guidelines and policies on the ethical use of AI writing tools.
- Provide training workshops to help students use AI tools responsibly and effectively.
- Encourage to discuss AI usage with students during the thesis process.
- Establish monitoring mechanisms to ensure ethical and transparent use of AI.
- Integrate AI literacy into postgraduate curricula to enhance digital research skills.

5.5 Suggestions for Further Research

- Future studies could include larger and more diverse samples from different universities and academic programs to improve the generalizability of the findings.
- Comparative studies involving students, supervisors, and examiners could provide a broader understanding of the use of AI in thesis writing.
- Future research could examine the long-term effects of AI tools on students' writing skills, research quality, and learning outcomes.
- More in-depth research is needed to explore ethical issues, institutional policies, academic integrity, and responsible use of AI in higher education.

- Future studies could focus on specific AI tools, such as ChatGPT, Grammarly, and QuillBot, and examine their impact on different stages of academic writing.
- Follow-up studies with the same group of students after completing their master's degrees could help assess how the use of AI writing tools influences their careers and further academic development.

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Appendices

Appendix A: Students' Questionnaire

I am Taqwa Mohamed Ahmed, conducting a research study entitled “Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at the University of Zawia.”

This study aims to explore the implications of using artificial intelligence in thesis writing among Master's degree students at the University of Zawia.

Your participation in this study is highly appreciated. The information you provide will help better understand how AI tools influence academic writing practices among postgraduate students. All responses will remain strictly confidential and will be used solely for research purposes.

The questionnaire consists of four sections. Please read each statement carefully and respond accordingly. Your cooperation and time are greatly appreciated.

A. General Awareness of AI tools in Thesis Writing:

1. I am open to integrating AI tools into the thesis writing process.

 Strongly disagree.

 Disagree.

 Neutral.

 Agree.

 Strongly agree.

2. I am aware that AI-powered writing tools exist for academic theses.

 Strongly disagree.

 Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

3. I am aware of the various AI tools available for academic writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

4. I am aware of AI writing tools that provide context-specific word and phrase suggestions to improve thesis writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

5. I am comfortable with the idea of using AI tools to enhance the articles or research papers writing process.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

B. Usage of AI Tools:

1. I usually use AI tools during my thesis writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

2. I believe that AI tools are easy to use.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

3. I believe that AI applications and tools contribute to reducing errors and inaccuracies in academic writing theses.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

4. I believe that using AI writing aids accurately understood and responded to writing theses prompts and requirements.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

5. Familiarity with AI tools positively influenced my willingness to use them in research thesis writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

C. Perceived Benefits of AI:

1. AI can enhance your research capabilities by provide personalized feedback on editing and drafting, highlighting the areas that require improvement.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

2. AI tools provide explanations that can improve writing quality by providing grammar and style suggestions, thereby enhancing the clarity and coherence of writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

3. AI tools can help ensure originality by checking for potential plagiarism in content.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

4. AI can help automate citation and formatting tasks, ensuring adherence to specific guidelines.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

5. AI tools like Grammarly helps to correct my grammar and punctuation in writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

6. AI tools like Google Translator help me understand complicated phrases and idioms.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

7. Quill Bot is a helpful AI tool to paraphrase my academic writing more professionally.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

8. AI tools foster decision-making to address problems encountered during my thesis writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

9. AI can enhance research efficiency by quickly analyzing vast amounts of literature, helping identify relevant sources, and summarizing key findings.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

10. AI tools can help ensure originality by checking for potential plagiarism in thesis content.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

D. Challenges of Using AI:

1. I am concerned that AI will further intrude on my privacy.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

2. I am concerned about cyber security (hacking and password protection).

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

3. I am concerned that I will tend to rely on AI writing aids during my thesis writing.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

4. I am concerned about the correctness of the grammar when using AI writing applications.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

5. I am concerned about the possibility of uncontrolled intelligence technologies in education (e.g., data security issues).

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

6. The use of AI writing tools disturbed my concentration while writing my thesis.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

7. AI writing aids with only one input form can be monotonous and boring.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

8. AI writing aids, such as paraphrasing, have limited suggestions for synonyms and are not always accurate.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

9. Students fear a lack of digital knowledge to use the AI writing tools.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

10. AI tools lack explainability that leads to doubts in my mind.

□ Strongly disagree.

□ Disagree.

□ Neutral.

□ Agree.

□ Strongly agree.

Appendix A: Students' Questionnaire.

Here is the link for the Google form version.

https://forms.gle/fmbdqZCTv11ziygX8

Appendix B: Students' Semi-Structured Interview Questions

"Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at University of Zawia"

The following are the interview questions were created in relation to meet the research objectives.

1. Are you aware that AI-powered writing tools exist for academic essays, articles, and research papers?

2. What motivates you to use AI tools in an academic work?

3. Based on your personal experience, do you believe that AI technology an effective tool for facilitating that can help to reduce anxiety related to writing a thesis?

4. Do you feel more confident about your writing skills after using AI tools?

5. How do you ensure that your privacy and security are maintained while using artificial intelligence technology for writing process?

6. Do you think that the use of artificial intelligence technologies in learning is beneficial for your overall learning experience? Why or why not?

7. Have you encountered any challenges or difficulties while using artificial intelligence technology for thesis writing? If so, please describe them.

8. How do you deal with technical issues or malfunctions that may arise while using artificial intelligence applications for thesis writing?

9. Would you recommend AI tools to other postgraduate students? Why or why not?

We appreciate your efforts in participating with us by sharing your opinions on the subject.

Note: In order to direct the interview, a schedule was created with the students that suits their time.

Appendix C: Sample of Interview Transcript

"Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at University of Zawia"

The interviewer: Hi and how are you? I am Taqwa Ahmed, and I want to inform you that all the information you are going to provide me will serve as a part of the data collection process for my thesis, which is entitled using artificial intelligence as Facilitating technological tools in Thesis Writing which talks about the learning perspective. That is why I am interviewing you. I would like to thank you for all your efforts in advance, so let us get started with the first question.

The interviewer: Are you aware that AI-powered writing tools exist for academic essays, articles, and research papers?

The interviewee: Yes, I'm aware that’s available for using, and I've been actively using these tools throughout my postgraduate journey. I work with AI-powered writing tools like ChatGPT and Grammarly for general writing support.

The interviewer: I see the second question: What motivates you to use AI tools in academic work?

The interviewee: In fact I use AI tools to enhance both efficiency and quality in my academic work. AI helps me brainstorm ideas, rewrite for example, organize my thoughts coherently, paraphrasing, and organize my content, which gave me more time for planning ,critical thinking and deep analysis that truly matters in academic work. Also AI tools help me identify gaps in my arguments, suggest clearer ways to express complex ideas, and point out areas where I need stronger evidence. They act like a thinking partner who's available whenever I need to work through difficult concepts. At the same time, AI help me express my ideas better and work more effectively, but the intellectual work—the analysis, the synthesis, the original insights—that's all mine.

The interviewer: Based on your personal experience, do you believe that AI technology is an effective tool for facilitating thesis writing that can help reduce anxiety related to writing a thesis?

The interviewee: Absolutely yes, based on my personal experience artificial intelligence writing tools has been genuinely effective in reducing the anxiety that comes with thesis writing journey, and it's helped me by breaking down these overwhelming tasks into manageable steps and offering feedback. Whether it's structuring chapters, paraphrasing dense literature, or organizing complex arguments, AI helps me tackle one piece at a time instead of facing the entire mountain all at once.

Having this instant support feels like having supervisor at any time I needed. The immediate feedback helps me stay confident and maintain progress rather than spiraling into self-doubt.

The interviewer: Do you feel more confident about your writing skills after using AI tools?

The interviewee: Yes, I feel more confident. My actual skills have genuinely improved through working with AI tools. AI has helped me develop stronger writing abilities through iterative learning. The tools offer suggestions on grammar, style, coherence, citation formatting, and argument structure. Each time I review these suggestions and decide whether to accept, modify, or reject them, I'm learning something about what makes academic writing effective. It's like having a writing coach who provides constant, detailed feedback.

The interviewer: How do you ensure that your privacy and security are maintained while using artificial intelligence technology for the writing process?

The interviewee: Oh, Privacy and security are critical concerns for me, at first; I carefully review the terms of service to understand how my data is stored. Then, I practice data minimization and I never input truly sensitive or confidential thesis data into AI systems, that’s what I’m only doing.

The interviewer: Do you think that the use of artificial intelligence technologies in learning is beneficial for your overall learning experience? Why or why not?

The interviewee: Yes, AI technologies have greatly benefited my overall learning experience, it enhanced me learn and understand complex material. AI facilitates deeper, more interactive learning. Instead of just passively reading academic papers, I

can asked AI for explanations of complex theories, ask for alternative perspectives, or request examples that connect abstract concepts to practical applications.

I also can engage in active learning by debating with AI to refine my arguments, asking it to challenge my assumptions, or requesting that it identify weaknesses in my reasoning. This kind of Socratic dialogue deepens my understanding in ways that passive consumption of information never could. That's why it's been so beneficial for my overall learning experience.

The interviewer: Have you encountered any challenges or difficulties while using artificial intelligence technology for thesis writing? If so, please describe them.

The interviewee: Yes, I' encountered challenges during using AI. The first challenge is the risk of over-reliance. Early on, I found myself accepting AI suggestions too readily without fully thinking through whether they actually improved my work. Also there are accuracy issues where AI providing confident-sounding information that was actually incorrect, or even citing papers that don't exist. This taught me that extensive factchecking is absolutely non-negotiable. Every claim needs verification, every citation needs to be confirmed in the actual source. Furthermore there are technical inefficiencies. Agent mode tools sometimes get stuck in loops if my prompts aren't precise enough, or they lose context over long conversations. This has made me much more careful about ensuring my own voice and thinking dominate in every section.

The interviewer: How do you deal with technical issues or malfunctions that may arise while using artificial intelligence applications for thesis writing?

The interviewee: When issue arise, I usually restart the tool or using another one if its stuck ,and if start working slow I try to clearing browser caches, updating software, checking my internet connection, or leave the application. Often these simple steps resolve the immediate problem for me.

The interviewer: Would you recommend AI tools to other postgraduate students? Why or why not?

The interviewee: Yes, I absolutely recommend AI tools to other postgraduate students, but with important caveats about how to use them responsibly and effectively. AI tools

genuinely enhance efficiency, creativity, and learning when used properly. They can help you brainstorm ideas, organize literature reviews, refine arguments, improve clarity, and work through conceptual difficulties. At the same time AI tools are not for generating entire sections of your thesis. They're for ideation, editing, analysis, and support—but the intellectual work must always be yours. Using AI to write content you don't understand or can't defend is both unethical and ultimately harmful to your own development as a researcher. Used properly, AI can genuinely transform your postgraduate experience for the better.

The interviewer: Thank you very much for your collaboration, your enrich information and valuable Contribution,

The interviewee: Thank you for these thoughtful questions, Taqwa. I hope my experiences provide valuable insights for your research on AI in thesis writing. This is important work you're doing, and I wish you great success with your study.

Appendix D: Invitation Message Sent to Participants

The following message was sent to postgraduate students via WhatsApp, Messenger, and email to invite them to participate in the questionnaire for this study.

Dear Students،

I hope this message finds you well. I am currently conducting a research study entitled "Using Artificial Intelligence as Facilitating Technological Tools in Thesis Writing: Perspectives of Postgraduate Students at the University of Zawia" as part of my Master's degree program.

Your insights and experiences as postgraduate students are highly valuable to this research, and I would greatly appreciate your participation.

The questionnaire consists of four sections, which takes approximately 15 minutes to complete. Participation in this study is entirely voluntary, and all responses will remain confidential and will be used solely for research purposes.

If you are willing to participate, please complete the questionnaire using the following link:

https://forms.gle/fmbdqZCTv11ziygX8

Thank you very much for your time and support. Your participation will contribute significantly to the success of this study.

Best regards،

Taqwa Mohamed Ahmed

Postgraduate Student

University of Zawia

Appendix E: Summary of Student Responses with Numbers and Percentage

Table 2: *Combined Students' Responses with Numbers and percentages*.

No	Statement	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		N	P	N	P	N	P	N	P	N	P
1.	I am open to integrating AI tools into the thesis writing process.	0	0%	3	7.3%	9	22%	22	53.7%	7	17%
2.	I am aware that AI-powered writing tools exist for academic theses.	0	0%	0	0%	8	19.5%	24	58.5%	9	22%
3.	I am aware of the various AI tools available for academic writing.	0	0%	1	2.4%	20	48.8%	10	24.4%	10	24.4%
4.	I am aware of AI writing tools that provide context-specific word and phrase suggestions to improve thesis writing.	0	0%	1	2.4%	12	29.3%	22	53.7%	6	14.6%
5.	I am aware of using AI tools to enhance the articles or research papers writing process.	0	0%	1	2.4%	12	29.3%	20	48.8%	8	19.5%
6.	I usually use AI tools during my thesis writing.	0	0%	6	14.6%	15	36.6%	15	36.6%	5	12.2%
7.	I believe that AI tools are easy to use.	0	0%	5	12.2%	8	19.5%	22	53.7%	6	14.6%
8.	I believe that AI applications and tools contribute to reducing errors and inaccuracies in academic writing theses.	0	0%	7	17%	9	22%	19	46.3%	6	14.6%
9.	I believe that using AI writing aids accurately understood and responded to writing theses prompts and requirements.	0	0%	1	2.4%	14	34.2%	21	51.2%	5	12.2%

No	Statement	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		N	P	N	P	N	P	N	P	N	P
10.	I believe that using AI positively will influence my willingness to use them in research thesis writing.	0	0%	0	0%	14	34.2%	16	39%	11	26.8%
11.	AI can enhance your research capabilities by provide personalized feedback on editing and drafting, highlighting the areas that require improvement.	0	0%	1	2.4%	5	12.2%	26	63.4%	9	22%
12.	AI tools provide explanations that can improve writing quality by providing grammar and style suggestions, thereby enhancing the clarity and coherence of writing.	1	2.4%	1	2.4%	11	26.8%	20	48.8%	8	19.5%
13.	AI tools can help ensure originality by checking for potential plagiarism in thesis content.	1	2.4%	5	12.2%	13	31.7%	14	34.2%	8	19.5%
14.	AI can help automate citation and formatting tasks, ensuring adherence to specific guidelines.	1	2.4%	3	7.3%	16	39%	17	41.5%	4	9.8%
15.	AI tools like Grammarly helps to correct my grammar and punctuation in writing.	0	0%	0	0%	8	19.5%	18	43.9%	15	36.6%
16.	AI tools like Google Translator help me understand complicated phrases and idioms.	2	4.9%	1	2.4%	13	31.7%	11	26.8%	14	34.2%
17.	Quill Bot is a helpful AI tool to paraphrase my academic writing more professionally.	0	0%	1	2.4%	20	48.8%	17	41.5%	3	7.3%

No	Statement	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		N	P	N	P	N	P	N	P	N	P
18.	AI tools foster decision-making to address problems encountered during my thesis writing.	0	0%	1	2.4%	15	36.6%	19	46.3%	6	14.6%
19.	AI can enhance research efficiency by quickly analyzing vast amounts of literature, helping identify relevant sources, and summarizing key findings.	1	2.4%	3	7.3%	9	22%	22	53.7%	6	14.6%
20.	AI tools save time and help to generate ideas during the thesis writing process.	1	2.4%	0	0%	6	14.6%	21	51.2%	13	31.7%
21.	I do not have knowledge on how to use AI tools effectively for my thesis writing.	3	7.3%	10	24.4%	9	22%	13	31.7%	6	14.6%
22.	Using AI tools raise ethical concerns in academic writing. They do not follow an accepted ethical guideline.	2	4.9%	0	0%	19	46.3%	10	24.4%	10	24.4%
23.	Relying too much on AI tools for my thesis writing may lead to over reliance.	0	0%	2	4.9%	9	22%	9	22%	21	51.2%
24.	Depending on AI tools leads to unintentional plagiarism and errors.	2	4.9%	1	2.4%	12	29.3%	16	39%	10	24.4%
25.	AI tools may hinder my personal writing skills, and intellectual development over time	2	4.9%	1	2.4%	9	22%	10	24.4%	19	46.3%
26.	AI-generated content may not be academically accurate.	1	2.4%	7	17%	12	29.3%	15	36.6%	6	14.6%

No	Statement	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
		N	P	N	P	N	P	N	P	N	P
27.	AI tools can sometimes misinterpret my writing needs, preferences, and citation.	1	2.4%	2	4.9%	10	24.4%	19	46.3%	9	22%
28.	AI tools can lead to a lack of critical thinking and a loss of my unique voice in academic writing.	2	4.9%	3	7.3%	7	17%	12	29.3%	17	41.5%
29.	AI's limited contextual understanding, leading to inaccurate information.	1	2.4%	4	9.8%	15	36.6%	15	36.6%	6	14.6%
30.	AI tools lack explainability that leads to doubts in my mind.	0	0%	4	9.8%	17	41.5%	11	26.8%	9	22%