EXPLORING POSTGRADUATE STUDENTS' EXPERIENCES, BENEFITS, AND DISADVANTAGES OF USING CHATGPT 3.5 AS A MORE KNOWLEDGEABLE OTHER (MKO) FOR SCAFFOLDING ACADEMIC WRITING AT A PUBLIC UNIVERSITY IN GREATER JAKARTA, INDONESIA

A Thesis

Submitted to the Master's Study Program of Education at the Faculty of Education in partial fulfillment of the requirements for the degree of

Master of Arts (M.A.)

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Maroof Ahmed

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ABSTRACT

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The integration of Artificial Intelligence (AI) tools in education, particularly for academic writing, has gained considerable attention. This study examines ChatGPT, an AI-powered writing tool, as a More Knowledgeable Other (MKO) in scaffolding postgraduate students' academic writing. It is based on Vygotsky's sociocultural theory and investigates the experiences, benefits and challenges of using ChatGPT 3.5 encountered by postgraduate students at a public university in Greater Jakarta, Indonesia. Adopting qualitative research methodology with case study design, the study sheds light on ChatGPT's use in academia through open-ended questionnaires and semi-structured interviews. The findings show that the students are positively disposed to ChatGPT because it supports their basic academic writing by handling the grammar, syntax, and structure, setting them free for more emphasis on the execution of higher-order writing skills with human MKOs. The study indicates that ChatGPT can be integrated into writing centers, tutoring programs, and coursework in developing students' writing with comprehensive feedback. The study also points out that ChatGPT needs constant assessment and improvement in light of feedback from users, enforcement of intellectual property rights, transparency, and data security to ensure ethical use. Overall, the study emphasizes the potential of ChatGPT as a viable tool to scaffold basic academic writing and suggests further examination in terms of its educational applications to assess the impact of the tool in other academic disciplines.

Keywords: *artificial intelligence, ChatGPT, more knowledgeable other, academic writing, higher education*

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ABBREVIATION DIRECTORY

AI	: *Artificial Intelligence*
CAI	: *Computer Assisted Instruction*
CCPA	: *California Consumer Privacy Act*
GDPR	: *General Data Protection Regulation*
ITSs	: *Intelligent Tutoring Systems*
MKO	: *More Knowledgeable Other*
NLP	: *Natural Language Processing*
ZPD	: *Zone of Proximal Development*

CHAPTER I

INTRODUCTION

In this chapter, an introduction to the study's background, research aims, questions, and objectives are presented, setting the foundation for a comprehensive exploration of the integration of ChatGPT in academic writing support for postgraduate students. The chapter begins by contextualizing the importance of academic writing in higher education, highlighting its essential role in scholarly communication, critical thinking, and professional development. It then transitions into a discussion of how technological advancements, particularly the use of AI-powered language models like ChatGPT, can serve as effective scaffolding tools, assisting students in overcoming writing challenges. The chapter structures the research framework, outlining specific aims and guiding questions of the study, and highlights the need for an investigation into the practical utility of AI tools in improving academic writing skills among postgraduate students. This foundational overview, sets the stage for a close exploration of the benefits, limitations, and potential implications of bringing ChatGPT into higher education as an academic writing support tool.

1.1. Study Background

At the very core of academic writing lies the primary tool of communication for persuading, arguing, and expressing ideas and research conclusions within an academic context. Characterized by clear structure, evidence in the argumentation process, and strict adherence to set style and format guidelines, academic writing is

a remarkable divergence from other genres of writing with respect to precision, objectivity, and formality (Gupta et al., 2022). Academic writing in higher education plays a linchpin role in the academic journey, interlacing threads of research, dissemination of knowledge, and skill development. This importance of academic writing arises from many factors (Jusslin & Hilli, 2023).

First and foremost, academic writing provides students, researchers, and teachers with a medium for expressing their ideas, findings and arguments. It creates a stringent platform for scholarly discourse. Being a medium of written communication, it furthers critical thinking whereby learners are obliged to understand, synthesize, analyze, and present their subject matter in a structured and formalized way (Arneback et al., 2017). Second, academic writing cements one's position in the academic circle. Individuals contribute to respective disciplines by continuing some of the discourses that have shaped and continue to shape disciplines through the publication of their research and findings (Liu & Zhu, 2023). Their publications build a platform for establishing academic credibility and authority, which is a crucial determinant of career development and one's ability to shape the direction of future research in a given field (Phillips & Johnson, 2022). Thirdly, Grotlüschen et al., (2020) posited that the writing itself could be a learning activity. Students, working their way through drafting their arguments coherently, often find that in the process, they have gone deeper into topics and grasped a clearer understanding of those. Thus, academic writing is not only a way to demonstrate knowledge and skills but also a way to enhance them.

This however does not suggest that academic writing is a monolithic practice. On the contrary, academic writing varies substantially with the level,

discipline, and purpose of writing as argued by Lea and Street (1998). For instance, postgraduate students, defined as those students undertaking advanced studies beyond the undergraduate level, masters or doctorate programs, undertake different challenges and expectations within the context of academic writing as indicated by Wisker (2012). This level mostly requires depth and specialization that usually amplifies the complexities in their writing endeavors (Gupta et al., 2022). For instance, one of the most daunting and demanding challenges postgraduate students face in academic writing is to write theses that showcase their contribution towards knowledge advancement in fields (Wang & Li, 2008).

The theses for postgraduate students are basically of different forms, all with characteristic features (Phillips & Johnson, 2022). Common among these is a traditional thesis report, which is a written document outlining methodology, findings, and conclusions. Another increasingly popular approach is the thesis by publication, whereby students collate a number of peer-reviewed articles or papers that they have authored during the process of their research work, with an emphasis on its dissemination to the academic community (Rafi, 2022). Others go for more creative expressions of their research—producing videos, drawings, or prototypes through which they express their findings (Literat, 2013). In the process, there is one common challenge in creating a traditional thesis or a thesis by publication which is integrating multiple, sometimes divergent, sources of information into a cohesive argument, ensuring that their stance is both original and evidence-based (Santini, 2021). Especially for non-native speakers of English, language and all its linguistic intricacies can put forward significant hurdles in being able to voice their ideas effectively through their academic writing. (Reyes et al., 2023).

Furthermore, writing a thesis report presents more demands, such as the precision required in descriptions of methodology, rigor in analysis, and depth in discussion sections, and, therefore, could create higher than expected pressure and consequent writer's block (Woods & Sikes, 2022). According to Rafi and Moghees (2023), most postgraduate students struggle to formulate clear thesis statements, argument structures, coherence, and cohesion in their theses. This is not solely a problem of the non-native speakers of the language; even the native speakers find the standards of academic writing quite challenging because of the strict academic regulations involved (Ito et al., 2023). Increasing diversity within postgraduate student populations in institutions of higher education also means an increase in writing backgrounds and skills, hence continuing to complicate the landscape (Deardorff et al., 2023). While such diversity is a strength, it can also bring about enhanced critical analysis through the availability of multiple viewpoints and varied cultural insights, nuanced sentence structures, precise vocabulary, and effective transitional phrases that incorporates such varied cultural insights into theses reports, making academic writing more challenges (Zhang, 2011). For instance, a foreign student from China may have brilliant knowledge of the research subject but not be able to write it in an English academic writing about complex ideas due to the difference in sentence structure and vocabulary usage as described by Hartse (2011). This makes it difficult for postgraduate students to write coherent and universally accepted academic texts.

On another front, in an age of information so widespread, the ability to communicate complex ideas effectively has gained prominence (Uccelli, 2023). Poor academic writing skills may cast a shadow over the groundbreaking thesis

research of a postgraduate by creating an inability to express it coherently. It would not only hinder their path of progression in academia but also the widespread use and share of important academic knowledge (Liu, 2023). Moreover, considering the emotional and psychological burdens that come with struggling in academic writing, decreased self-confidence, increased anxiety levels, and possible imposter syndrome, it becomes clear that higher education institutions have both academic and moral interests invested in the betterment of such challenges (Salimzadeh et al., 2021). Addressing these writing challenges ensures growth of capable postgraduate who can contribute meaningfully to academia and society at large. As such, educators come up with varying pedagogical techniques and practices that may best enable students to improve their academic writing. Among these is the concept of the More Knowledgeable Other (MKO), originated from Vygotsky's, (1978) Sociocultural Theory.

According to Vygotsky (1978), the MKO refers to any individual or resource who possesses greater proficiency or is better suited to help the student comprehend a specific activity, procedure, or idea than the student himself/herself. The MKO guides the student from their present developmental zone to the Zone of Proximal Development (ZPD) — the area in which a person may master a task or body of knowledge with the assistance of an expert but cannot do it on their own (Vygotsky, 1978)—through the scaffolding process. More precisely, when it comes to academic writing, they could be advisors or supervisors who can assist in giving students basic input on how to navigate the complexities of their research and writing (Ma, 2019). Peers may also be useful sources of MKOs since they can provide fresh perspectives and constructive feedback to help (Palincsar, 1998).

Scaffolding refers to a particular level of support to learners provided by an MKO. This educational strategy provides learners with temporary, graduated support that helps them achieve goals that would be beyond their reach if they were to attempt them independently (Frey et al., 2023). Dennen (2013) delineates several forms and modes of scaffolding, started from giving verbal instruction up to modeling as a form of contingency. Verbal instruction, as outlined by the author, entails the provision of explicit explanations, directives, or instructions to learners regarding task execution or writing enhancement. Written feedback involves the presentation of remarks, recommendations, corrections, or commendations concerning learners' written work, whether provided in real-time during the writing process or following its conclusion. Modeling encompasses the display of illustrations elucidating the art of text composition or the utilization of particular language elements and genre conventions.

Questioning, as outlined, entails asking the learner questions to trigger recall of prior knowledge, activate cognitive interest, or directing the writing process. Prompting is giving the learner cues, hints, and reminders to complete a task or overcome an obstacle. Collaborative conversation, according to Dennen (2013), can be described as engaging the learner in conversations with an MKO or with a peer who hold different perspectives or experiences. Such dialogues could enhance understanding, critical thinking, and creativity. The provision of case studies and examples of the use of such scaffolding modes can showcase the application of such scaffolding modes and MKO relationships in academic writing. For instance, a study carried out by Sosibo (2013) on supervisors as MKOs in the dissertation writing process of postgraduate students revealed that it was through guidance and

feedback that there were tremendous improvements in the students' quality of writing.

Additionally, a project by Cho and MacArthur (2011) introduced the process of peer review into a graduate writing class, underlining how peers have played the role of MKOs to take one through structured feedback toward improved writing skills. Another example is that of Ives and Rowley's (2005) research, in which it was described how a group of doctoral students used an online forum to exchange drafts and feedback with each other to achieve the effect of creating a digital community of practice where peer-to-peer scaffolding was on the rise. Further, a study by Topping et al. (2000) in a higher education setting included reciprocal peer tutoring for writing which testifies to the use of providing students with an avenue to scaffold each other's learning, leading to enhanced writing competencies. It is through such interaction with knowledgeable co-agents that postgraduate students can learn the negotiation of academic discourse relevant to their fields and further develop their skills in the apt expression of complex ideas and research findings (Lei, 2008). It is the kind of interaction that not only lays the bedrock for the acquisition of writing skills but also enriches the attributes of analytical and critical thinking upon which robust scholarly work is founded (Daud, 2011).

However, MKO itself is not limited to one-to-one contact between the student and the supervisor via scaffolding. It can manifest in different forms and modes depending on the nature of the task, the goals of the instruction, and characteristics of the learners involved (Rapp & Kauf, 2018). Academic resources—such as writing centers, specialized software, and online databases—

are non-human MKOs that offer structured support and access to large, in-depth knowledge bases from which students significantly benefit in understanding and applying the concepts of writing (Rapp & Kauf, 2018). Additionally, writing groups and peer-review sessions offer collective scaffolding environments that enable students to gain various feedback and learn how to make proper critiques of their own and other people's works, which are defining skills for an academic writer (Aitchison & Lee, 2006).

Moreover, the advent of technologies has completely changed the landscape of academic writing support, opening a number of alternative ways to scaffold through an array of digital tools and platforms. For instance, digital writing tools such as Grammarly or Turnitin provide instant feedback through algorithm-driven responses on grammar, structure, and even plagiarism, thus becoming digital MKOs (Mastorakis, 2022). Online forums and academic social network sites like ResearchGate and Academia.edu provide a space for peers to interact with one another and share ideas, thereby bringing the concept of collaborative learning into an online setting (Asmi & Margam, 2018). While the MKOs and scaffolding certainly have key roles in the development of academic writing skills, there are a number of ways in which the postgraduate student might struggle to draw upon these supports. Accessibility can be a significant challenge because not every student has the same opportunity to interact with an MKO due to factors such as institutional constraints or even the absence of supervisors (Adeoye & Popoola, 2011). Subsequently, the variation in MKOs' degrees of experience affects the effectiveness and caliber of scaffolding, leading to uneven growth of writing abilities (Tharp & Gallimore, 1991).

Nevertheless, the benefits of effective scaffolding are many. Students can accelerate the development of academic writing through scaffolding, and then, slowly, imitate and internalize the support provided by the MKO (Rosenshine & Meister, 1992). Also, effective scaffolding on the part of the MKO enhances academic confidence and self-efficacy since students are guided to do complex tasks in quite manageable steps, thus making sure that the learning objectives are met (Eguara, 2021). Besides, scaffolding allows for independent learning skills through gradual releases of responsibility from the MKO to the student, encouraging autonomy (Puntambekar & Hubscher, 2005). Other studies focusing on academic writing shed light on the dynamic interplay between MKO, scaffolding and ZPD (Muntasir & Akbar, 2023; Mdodana-Zide & Mafugu, 2023; Ikawati, 2020; Hasan & Rezaul Karim, 2019; Nordlof, 2014; Shil & Rahman, n.d.; Shooshtari & Mir, 2014; Veeramuthu et al., 2011; Leong, 1998). Yet there is a significant difference that spans the theoretical divide into its practical application in these educational strategies. Most of the academic writing programs that purport to prepare students actually focus on theoretical, not practical, compositional skills (Alostath, 2021); this sets students up for failure at the postgraduate level, which makes more granular demands on writing (Strauss, 2017) such as being able to write critical analysis, synthesis of complex ideas, formatting and citation styles specific to disciplines, effective integration of empirical data, and advanced research methodologies.

Because of this inadequacy, the exploration of AI scaffolding agents for academic writing proves a promising alternative (Guo et al., 2022). It provides very dynamic and customized support that is likely to progress beyond the limitations of

previous practice, which did not include practical complexities such as combining multiple sources of information, following multiple citation styles, and keeping track of a consistent argument with compelling natures in advanced academic writing tasks (Alharbi, 2024). AI agents can be defined as computer programs that express human-like intelligence and behavior, such as natural language processing, reasoning, learning, and problem-solving (Lund et al., 2023). According to Kelly et al., (2023), AI agents are different from the rest of AI systems which are non-agents and might not exhibit the exact same level of autonomous functionality. For example, trivia or quiz bots are rule-based chatbots that do not learn or adapt with respect to one's level of knowledge, rather they always ask questions at the same level of difficulty regardless of one's previous answers. The emergence of AI agents has brought an additional dimension to this writing support through immediate feedback and improvement suggestions that can generate drafts based on user prompts for the iterative process of writing development (Golan et al., 2023). Such AI agents can more specifically assist the manifold immediate concerns and questions that students may have during their writing tasks, and thus be complementary to the traditional role of the MKO as described by Flogie & Aberšek (2022). The integration of these technologies in supporting academic writing not only offers varieties in accessible forms but also readies graduate students for an increasingly digitalized environment within which the ability to engage and make use of digital tools is becoming a requisite (Bikowski & Vithanage, 2016).

Many AI agents, such as Trinka, Perplexity, Genei, QuillBot, TextCortex, and Microsoft Copilot are adept at tasks associated with academic writing. However, ChatGPT distinguishes itself in this arena with its sophisticated language

generation capabilities and its contextual understanding, which are essential for the scaffolding of academic writing skills. According to Krüger and Gref (2023) some of these AI agents, like Perplexity and Microsoft Copilot, even use ChatGPT at their backend to do the assigned academic writing tasks (Forsén, 2024). Some other AI agents like IBM Watson and Google BERT have their own areas of specialty, such as data analysis and search query interpretation, ChatGPT is particularly tailored for natural language generation and conversation. This makes it exceptionally well-suited for the interactive process of writing, where feedback and dialogue are key. Unlike Watson or BERT, ChatGPT can simulate the iterative process of human writing, where ideas are developed, refined, and expressed in a conversational context. It can generate drafts, suggest revisions, and even provide explanations and clarifications, emulating the writing support typically given by human tutors (Ray, 2023).

Cao et al. (2023) states that the development of ChatGPT dates back to June 2018, when the first GPT model was released and had 117 million parameters trained on 40 GB of text. This version could generate intelligible text but had problems like repetition and wrong facts. In February 2019, OpenAI published a larger model called ChatGPT-2 with 1.5 billion parameters using still using 40 GB of text. This model provided more coherent and more diverse outputs but increased the risk of generating misleading content in the outputs (Mohamadi et al., 2023). The next significant breakthrough was ChatGPT 3 in May 2020 and ChatGPT-3.5 in November 2022. ChatGPT-3.5 featured 175 billion parameters, trained on 45 TB of text, and showed outstanding capabilities to generate texts in most forms (Liu et al., 2023). According to Wagner & Ertl-Wagner (2023), ChatGPT-3.5 has already

been applied in many domains related to content creation, teaching, scientific research, and business applications; the tool simply shows that it is more versatile than ever before. It is capable of assisting in generating new and interesting texts and providing instructional guidance for academic writing, and even enable collaborative conversation in order to improve learning and creativity (Dergaa et al., 2023).

The underlying model of ChatGPT, trained on a large corpus of text, allows for very broad and nuanced language understanding, making it capable of aiding students in most writing tasks, such as brainstorming, outlining, and editing. One can even conduct a written dialogue with the tool; it adjusts to the student's writing style, tone, and content needs. This constitutes a very useful feature (Mohamadi et al., 2023). For example, it could turn postgraduate students' incorrect or informal English into formal academic writing. This is in line with the principles of ZPD, as ChatGPT would be able to provide the relevant help at the level required by the learner based on the prompt from the user. A prompt is a text-based entry (e.g., a question, instruction, topic) that the user types into ChatGPT in order to receive a response. Even if the prompt given to it is in any language and whether it is grammatically right or wrong, ChatGPT can respond well since it has been trained on a diverse range of texts that enable it to support more than 50 languages. It can predict a suitable response to the prompt based on its training data and the context of the dialogue.

Moreover, real-time interaction provided by ChatGPT itself allows for the immediate application and practice of writing skills. It creates a dynamic learning environment in which the feedback is not only individualized but immediately

available. According to Ray (2023), the immediacy is quite important to keep up the momentum of learning and writing that other AI agents may not be able to do quite as well. For this study, ChatGPT was chosen because of its unrivaled resonance to the requirements of academic writing assistance. Not like other AI agents in the writing process, ChatGPT demonstrates an outclassing performance by giving learners a conversational partner able to instruct, support, and challenge them within their ZPD and could transform the approach toward academic writing in higher education. Dergaa et al. (2023) and Stojanov (2023) indicate that ChatGPT has the potential to combine the benefits of both human and virtual MKOs, sidestepping the drawbacks of the farmer and latter. It is capable of scaffolding for academic writing as an MKO. For example, it might provide students with verbal instructions about how to approach a writing task, how to use particular features of language or genre conventions effectively, and so on. This mirrors the function of a human MKO who provides direct verbal assistance or guidance during the process of learning (Vygotsky, 1978).

ChatGPT can also write feedback to the student either in real-time, during the writing process or after completion, similar to the constructive feedback usually given by the human MKOs (Hattie & Timperley, 2007). Through such feedback, the student knows his or her strengths and weaknesses in writing to help them in self-improvement and developing skills. Further, ChatGPT can also model writing, showing how texts are composed and which particular language features or genre conventions are applied through examples and step-by-step directions. Again, this parallels the work of a human MKO modeling tasks for learners (Wood et al., 1976).

In this case, students can learn strategies for writing by looking at how the AI model writes.

Apart from that, ChatGPT is able to trigger students' prior knowledge and guide their writing by putting forward questions that can help them participate in critical thinking and creative writing. In respect thereof, this falls within the concept of the virtual MKO, which puts technology at the forefront in efforts to foster higher-order cognitive processes (Nowlan, 2022). Students can engage in practices for in-depth learning of the subject under discussion and acquire relevant writing skills through engagement with the prompts and questions provided by ChatGPT.

Last but not least, ChatGPT is able to co-dialogue with students, simulating peer interaction that exposes learners to others' perspectives and experiences. Such interaction could improve their understanding, critical thinking, and creativity, just as the collaborative learning experiences in classrooms (Vygotsky, 1978). On this base, the unique ability of ChatGPT to provide verbal and written guidance, model writing processes, stimulate critical thinking, and facilitate collaborative dialogue positions it as a versatile MKO about academic writing and potentially fuses the benefits of a human and a virtual MKO while mitigating their limitations.

According to Song and Song (2023), ChatGPT can act as an agent of accessibility, availability, flexibility, adaptability, and interactivity for students. Joshi et al. (2023) also mentions that a student can log into ChatGPT using their device and platform and have access to it at any time and from anywhere. Secondly, ChatGPT is flexible and adaptive, handling different sorts and levels of tasks to suit individual requirements (Santhosh et al., 2023). Its interactivity allows natural language conversations, enhancing understanding and developing critical thinking

in real-time (Silva & Janes, 2021). Furthermore, ChatGPT is capable of enhancing students' productivity by rendering helpful information since it is capable of organizing collaboration and promoting time efficiency as well as effectiveness (Fauzi et al., 2023). The fear would, however, be that this may lead to over-reliance on ChatGPT and a lack of real knowledge acquisition (Joshi et al., 2023).

It is pertinent to mention that there are certain challenges and limitations that need to be accounted for while using ChatGPT as a source of scaffolding for academic writing. For instance, Hs Kumar, (2023), has found that while ChatGPT responded very fast to produce systematic and original content, it turned out to be lacking in depth and quality for academic writing. According to Garg et al. (2023), there are several concerns in the accuracy of results, authorship, and bias when using ChatGPT in research. Joshi et al. (2023) demonstrated ChatGPT's unreliability in answering various questions related to computer science, which does raise concerns for those students who depend on ChatGPT to do their assignments and exams. Oh (2023) investigated the use of ChatGPT for liberal art writing education and represented positive perceptions but also revealed concerns about information quality and credibility. It is, therefore, incumbent on one to monitor and assess how ChatGPT can act as an agent of scaffolding, helping postgraduate students in higher education with their academic writing.

1.2. Research Aims and Questions

This study explores the embedding of ChatGPT - an AI-powered language model - within the context of higher education from the postgraduate students' perspective. Specifically, it aims at contributing to an understanding of how AI

agents might be used to assist and enhance the educational experience for postgraduate students, alongside a deeper understanding of their academic writing processes in the digital age. This overarching aim can be distilled into the following research questions, each of which addresses specific facets of ChatGPT's utility among master's level postgraduate students' experiences, benefits, and disadvantages of using ChatGPT 3.5 as a more knowledgeable other (MKO) for scaffolding academic writing.

1. How do postgraduate students describe their experiences with ChatGPT 3.5 when it is used as an MKO for scaffolding their academic writing?
2. In what ways do postgraduate students find ChatGPT 3.5 helpful when it is used as an MKO via the process of scaffolding for overcoming writing challenges?
3. What are the potential limitations of relying on ChatGPT 3.5 as an MKO for scaffolding academic writing from postgraduate students' perspectives?

1.3. Research Objectives

Building upon the established research questions, the researcher framed the following research objectives:

1. To explore students' experiences with using ChatGPT 3.5 as an MKO to scaffold academic writing.
2. To identify the practical benefits and applications of ChatGPT 3.5 as an MKO that students find helpful when it is used as a scaffolding tool for overcoming writing challenges.

3. To evaluate the perceived advantages and disadvantages of employing ChatGPT 3.5 as an MKO for scaffolding academic writing.

1.4. Significance of Study

Firstly, the study is significant as it explores a relatively uncharted area in the realm of educational technology. While the integration of AI in education is increasingly prevalent, specific insights into how AI, particularly ChatGPT, functions as an MKO for academic writing support are lacking. Specifically, as of the time of this research, no study has employed the concept of MKO (More Knowledgeable Other) within the context of scaffolding as the underlying theoretical framework. It is in this gap that this research aims to give information on the practical utility of AI tools in a higher education setting. The second reason justifying the need for the study is the necessity to understand intricacies of academic writing support at the postgraduate level. Academic writing is a complex skill that thrives in a higher education setting. It is expected to lead one to success in higher education, yet often turns out to be elusive to students. By examining how ChatGPT can help overcome these challenges, the study adds to its potential use as a pedagogical tool for academic writing purposes in higher education. In addition, the study discusses possible limitations and concerns of relying on AI for academic writing support; on their part, educators and educational institutions should be aware of them to be in a position to make relevant and informed decisions pertaining to the integration of AI tools like ChatGPT within educational practice.

CHAPTER II

THEORITICAL FOUNDATION

The purpose of this chapter is to provide a theoretical framework for the integration of ChatGPT within the domain of academic writing support in the higher education sector. The chapter begins with the literature associated with Vygotsky's (1978) Sociocultural Theory, particularly its use within educational settings, together with the concepts of MKOs and scaffolding. This theoretical background is important in helping understand how AI tools such as ChatGPT can complement conventional pedagogies of learning from the human MKOs. The chapter also reviews the development and efficacy of digital MKOs and the ways in which these AI technologies are utilized within pedagogical settings. The chapter also offers presentation of the capabilities of ChatGPT and its role in supporting academic writing, bringing out unique features and potential applications that set this AI tool apart from other traditional means. Synthesizing such theoretical and practical insights, the chapter paves the way for further exploration into AI enhanced scaffolding within higher education, addressing both the benefits and challenges associated with integrating ChatGPT as a digital MKO.

2.1. Literature Reviews

This section considers Vygotsky's (1978) Sociocultural Theory and AI in education as the theoretical framework for this study. First, the researcher defines the key ideas and principles of Vygotsky's Sociocultural Theory. Then, the roles of the human and digital MKO as facilitators of learning through social interaction are

presented. The researcher then focuses on scaffolding of academic writing—how it underpins the development of skills and guides students through the process. This is followed by an analysis of where AI-based writing assistants such as ChatGPT fit into the scaffolding process: how they provide students with personalized, adaptive feedback. The researcher has also made a critical review of studies available on the efficiency and implications of ChatGPT in educational settings. Finally, since the issue is centered on the use of AI tools in higher education, the researcher has shed light on the gaps of the previous studies and ethical problems that need further investigation.

2.2. Theoretical Framework

A Theoretical Framework is an essential component of a research study that allows for overall conceptual underpinning of the investigation and contributes to understanding research questions and hypotheses in a clear and concise manner (Grant & Osanloo, 2014). In the case of the present study, the theoretical framework revolves around some key concepts that make a contribution to the actualization of ChatGPT as an MKO for the scaffolding of academic writing in higher education. Some of these concepts include:

2.2.1. Sociocultural Theory

Vygotsky's (1978) Sociocultural Theory gives a very important theoretical framework to perceive the processes of learning within social contexts. Vygotsky (1978) believed that social interaction is central to developing cognition. According to him, every cognitive function has its origin in and is shaped by social interactions,

challenging traditional notions of learning as a purely individual process (Vygotsky, 1978). Vygotsky's (1978) notion of Sociocultural Theory is developed further by John-Steiner and Mahn (1996), who strongly emphasize the role of cultural tools and artifacts in mediating cognitive development. The authors state that tools, beginning with language and symbolic systems, are resources that facilitate conjoint constituent meaning-making by individuals within their social environment. The authors highlight cultural tools shape the ways in which knowledge is constructed, shared, and internalized.

Wertsch (1985) contributed a great deal to the evolving ideas that Vygotsky (1978) had put forward, specifically through the notion of ZPD. Wertsch (1985) showed that ZPD represents an area in which learning is most potent—that is, when it occurs with more knowledgeable others. This contribution builds on Vygotsky's (1978) focus on the social nature of learning, elaborating on how such collaborative interactions, if guided by a more knowledgeable peer or mentor, foster cognitive development within a learner. The implications of Vygotsky's (1978) Sociocultural Theory are equally applicable in different learning contexts. Taking a cue from Vygotsky (1978), Bruner (1996) advocated for pedagogy with a focus towards scaffolding—that is, supporting learners when they are performing difficult tasks. Bruner (1996) suggested that teachers must organize learning experiences and set up a framework so that students progress through the ZPD based on their present understanding.

Furthermore, Vygotsky's (1978) Sociocultural Theory has found applications in technology-enhanced learning environments. Kozulin (2003) explored how computer tools may mediate social interactions, facilitating the

establishment of collaborative learning experiences that foster ideal settings, which align with Vygotskyan principles. Kozulin (2003) pointed out that technology could function as a cultural tool that mediates the development of cognition and hence could extend Vygotsky's (1978) framework into the digital age. Other scholars' who have enhanced Vygotsky's (1978) Sociocultural Theory include John-Steiner and Mahn (1996), Wertsch (1985) Bruner (1996) and Kozulin (2003). These scholars have broadened and used Vygotsky's (1978) ideas, to improve the understanding of how social interactions, cultural tools, and collaborative learning take shape to form cognitive development in educationally diverse contexts.

2.2.2. Scaffolding

Scaffolding is a concept rooted deeply in Vygotsky's (1978), Sociocultural Theory. It is a metaphor to the support and guidance provided by the more knowledgeable other to help learners move beyond their present level of competence. This concept is very instrumental in understanding the dynamics behind effective learning and instruction, especially with complex cognitive tasks such as academic writing at higher education levels. According to Wood et al. (1976), scaffolding in education refers to the temporary support given to learners that enables them to perform tasks they would not have been able to accomplish independently. The support is gradually withdrawn with an increase in the level of competence of the learner, fostering independence and mastery of skills (Raymond, 2000). Scaffolding is not necessarily a process of giving answers; rather, it prompts, questions, and structures tasks to assist in learning (Rosenshine & Meister, 1992).

Scaffolding is key to increasing the likelihood of positive learning outcomes, more so in the development of higher-order thinking skills and mastering complex concepts, within educational settings (Stone, 1998). This can be done by instructing how arguments should be structured during the academic writing process of postgraduate students, how draft manuscripts should be reviewed to receive appropriate feedback, and even by explaining academic writing conventions (Palincsar, 1998). Because technology has been integrated into today's education, the theme of scaffolding expands in scope. Digital tools, including AI, provide new modalities through which scaffolded instruction could be provided. They make available adaptive support tailored to learners' needs and are always available on demand, thus increasing flexibility and access to educational support (Luckin, 2010; Pea, 2018).

Recent research views AI-based tools as holding huge potential for effective scaffolding. For example, AI can aid in giving individual feedback on idea generation and structuring complex tasks which are very important scaffolding strategies (Roll & Wylie, 2016; Xie & Reider, 2014). This thereby presents a high potential of the ChatGPT AI tool in promoting a learning experience in highly skilled areas of academic writing. The concept of scaffolding assumes a place of primacy when it comes to understanding effective teaching and learning processes. The recent upsurge of AI tools within educational contexts brings opportunities and challenges to the implementation of scaffolding strategies in higher education settings. This review underlines the need to explore how digital technologies could be designed to embed the principles of scaffolding in support of complex learning tasks like academic writing for postgraduate students.

2.2.3. More Knowledgeable Other (MKO)

An MKO, through the lenses of scaffolding, is a person or other resource that has a higher level of knowledge or absolute skill relative to that of the learner in respect to some particular domain. The MKO could be a teacher, peer, or even a technological tool that provides guidance and support within the ZPD. Vygotsky (1978), highlighted that the role of the MKO is not to provide the answers but to scaffold the learner's development, transfer of skills and knowledge from the social to the individual domain (Rogoff, 1990). Traditionally the MKO has been human, that is the instructors or peers – in the context of higher education (Daniels, 2008). The traditional view, however, is put to task with the emergence of advanced AI technologies, such as ChatGPT, and suggests due course called for in reimagination of the role of MKO within the digital age of today (Wegerif, 2007).

Recent research has turned to the exploration of AI's potential as a non-human MKO. For example, Ekstrand et al. (2003) note that technological tools, if appropriately designed, may turn into MKOs in ways enabling cognitive development similar to human-like interaction. From this, some interesting implications regarding the role of AI in educational settings emerge—for example, in academic writing, wherein personalized guidance is required at a higher level (Kamalov et al., 2023). Vygotsky's (1978) Sociocultural Theory, specifically the notion of the MKO, provides a good framework through which one can pursue an investigation into the role that AI tools like ChatGPT play in higher education. This theoretical background can help to provide the context within which it could be examined on how digital technologies might be imbued with MKO characteristics,

hence opening new avenues of scaffolding and learning opportunities in the digital era.

2.2.4. Sociocultural Theory and Technology in Education

One of the important lines of investigation within the modern context of education research is where sociocultural theory meets technology. More specifically, this relationship attempts to explore how digital tools like ChatGPT today, with AI-based technologies at the helm, fit and further extend Vygotsky's (1978) ideas on Sociocultural Theory within the present learning environment. Central to Vygotsky's (1978) theory is mediation, which is using tools and signs to accomplish cognitive processes. If applied to the use of technology in education, that digital tools act as mediators in a manner that can enhance and transform learning experiences (Salomon et al., 1991). The integration of technology into learning processes contrasts with the notion enunciated by Vygotsky (1978), who believed that learning is a socially and culturally mediated process in which tools are considered inalienable components to forge cognitive development (Kozulin, 2003).

AI, in and of itself, has advanced to the level at which technology can function as a More Knowledgeable Other. In this role, technologies like ChatGPT are able to provide guidance and feedback in keeping the learner within the ZPD. Its ability to process and analyze large amounts of information makes the AI capable of acting as an informed guide in educational settings (Luckin, 2010). The role of technology resists traditional conceptions of the MKO and widens the definition to include non-human actors. Technological solutions, more so AI-driven tools, can innovate

scaffolding strategies for this task. Such tools can provide adaptive and personally relevant learning experiences, central to effective scaffolding (Belland, 2011). With the advantage that it can analyze learner data and make adjustments to the supports based on them, technology can provide a level of individualized scaffolding that previously was hard to attain (Roschelle et al., 2000).

As a researcher of this study, I argue that the rightly guided integration of technology by sociocultural tenets can bridge the gap between theoretical conceptualizations and practical applications in education. If one were to use technologies in such a way that they align with Sociocultural Theory, it should create the atmosphere wherein learning is collaborative, contextually situated, and mediated by tools extending cognitive capacities (Land & Jonassen, 2012). I believe that the relationship between Sociocultural Theory and educational technology is one of the most critical aspects of exploration, as this relationship brings out the fact that AI technologies like ChatGPT have the potential to work not just as tools but as constituents of the teaching and learning process, embedding some of the major principles of mediation, MKO, and scaffolding put forward by Vygotsky's (1978) theory. It is an important perspective in terms of both the understanding and the acting upon the potential of technology for learning in higher education.

2.3. ChatGPT and Artificial Intelligence in Education

The journey of artificial intelligence in education has been one of great change, driven by technological advancement and changing pedagogical paradigms (Young, 2024). Increasing recognition of AI's potential for improving teaching and learning processes has been behind the driving force of this evolution. The first

tentative steps of applying AI to education began with computer-assisted instruction (CAI) and intelligent tutoring systems (ITS), originating in the late years of the 20th century. Basically, such systems, including SCHOLAR and GUIDON, were rule-based expert systems which would tutor students in particular subjects (Carbonell, 1970; Clancey, 1979). These early systems formed the base for future AI applications in education, showing how technology could individualize instruction.

The developments in machine learning algorithms and data analytics gave further impetus to the development of more advanced adaptive learning systems. Conspicuous among such platforms were DreamBox Learning and Knewton, which utilized artificial intelligence to analyze student performance data in order to adjust teaching content in a manner tailored for each kind of learner (Demianenko, 2019). The shift toward adaptive learning underlined AI's capacity for dynamic and learner-centered approaches to education. Another key development has been the integration of AI with learning analytics. Tools like Turnitin and Grammarly exploit AI to give feedback on writing, while platforms such as Coursera exploit the same in analyzing learning patterns to optimize course offerings (Siemens & Baker, 2012). Such applications give example cases of how AI can be used in analyzing complex data sets aimed at improving learner outcomes and educational decision-making.

Recent trends in AI in education emphasize personalization and facilitation. In the form of chatbots, virtual assistants, and language models like ChatGPT, AI enters an era where it is not only adapting to individual learning styles but also interacting in a more human way to guide, answer queries, and facilitate learning processes (Luckin et al., 2006). Despite these advancements, the integration of AI

in education raises challenges and ethical considerations. This points to the need for further research and policy development, alongside concerns over challenges to data privacy and the digital divide, and bias reproduction from AI (Holmes et al., 2023). The development of AI within educational settings shows a trend from the relatively simple automated tutors to complex adaptive systems that are able to attain individual interactive learning. The evolution underlines how AI is getting to be a big factor in reshaping educational practice and, in particular, the need for efforts to be directed toward addressing many of the challenges arising from AI's development.

2.4. ChatGPT's Technology, Capabilities, and Role in Educational Settings

OpenAI's ChatGPT is an innovative development in natural language processing (NLP) and in the field of artificial intelligenc. Its unique technology and capabilities put it down as a tool in the educational landscape, particularly in the role that it can play as a facilitator of learning and an interactive agent. ChatGPT is based on the famous GPT architecture—a type of language model that is often found for its capability to generate coherent and relevant text around input prompts (Radford et al., 2019). This technology involves deep learning algorithms and vast datasets for the understanding of human-like text. This usage opens up quite a broad spectrum of applications with language-based tasks. This is hailed as the greatness of ChatGPT, which goes through a two-stage training process: first, pre-training on texts derived from the Internet, and then fine-tuning with supervised learning on specific datasets. It undergoes pre-training on widespread text found on the Internet. This pre-training could assist the model in developing a common understanding of

the language and the context. Then, ChatGPT is fine-tuned with supervised learning, where it is trained with specific datasets so that an enhancement can be brought out in its response and accuracy relevance across various contexts (Brown et al., 2020).

One of the central capabilities of ChatGPT is its interaction. Somewhat distinct from its predecessors in the field of NLP, ChatGPT can boast the capacity for natural and human-like dialogue. Its capacity to remember and reference former parts of the conversation renders it quite instrumental in interactive scenarios in learning situations (Bender et al., 2021). Features of ChatGPT have already been harnessed to do so much in an education environment. It can thus be used to generate educational content and explain it while supporting language learning (Patel et al., 2023). Further, the capability to provide instant feedback on written text renders it very functional for students in writing improvement and comprehension specifically (Elbanna & Armstrong, 2023).

While ChatGPT's capabilities are impressive, one must not forget its limitations. Concerns over the accuracy of information, possible biases in its responses, and constantly updating the training data are pertinent issues. According to Rahman and Watanobe (2023), this technology in the educational setting begets questions on student dependency and reduced skills in critical thinking. The technology and possibilities of ChatGPT instigate a strong step forward in using AI within education. Its interactivity and adaptability bring into contention new ways of engaging and learning. However, awareness of the limitations and possible challenges posed by ChatGPT is required for its effective and responsible integration within educational contexts.

Understanding ChatGPT's role in education requires a comparison with other AI tools used in educational settings. As per Koedinger & Corbett (2006), such a comparison highlights the unique attributes and likely uses of these tools in facilitating learning. For instance, over the past several decades, Intelligent Tutoring Systems (ITSs) like those of Carnegie Mellon's Cognitive Tutors have been used to provide individualized instruction and feedback. In contrast to ChatGPT, which is focused on language processing, ITSs are often specific to the subject at hand; for example, mathematics and science. ITSs adopt algorithm rule-based approaches that lead students through problem-solving processes, while the real power of ChatGPT is in natural language interaction and the generation of diverse content.

Adaptive learning platforms, such as such as DreamBox Learning or Knewton, use AI to tailor learning content according to the needs of the learner. These systems keep track of student performance and accordingly change the type of content apart from its level of difficulty (Srinivasa et al., 2022). While the learning platforms, themselves adaptive, are curricular in nature, ChatGPT has more flexibility and adaptability with regard to content and style, thus making it quite suitable for a wide array of conversational purposes and tasks for content generation (Rahman & Watanobe, 2023). In the case of educational chatbots for language-learning such as Duolingo, they are designed to work on particular learning tasks. The chatbots make use of AI to simulate conversation and practice language skills accordingly (Annamalai et al., 2023). Such conversations can be more complex and varied with the advanced language model of ChatGPT, making

it versatile for wider applications in education beyond structured language practice alone (Fauzi et al., 2023).

AI-based writing assistants, such as Grammarly, rely on AI algorithms for suggestions related to grammar and style (Alharbi, 2023). Although these applications are more efficient in fine-tuning the mechanics of writing, ChatGPT is in a position to assist with the generation of ideas, draft formation, and, providing feedback on writing structure and content—hence becoming a more complete writing assistant (Santhosh et al., 2023). Of these, ChatGPT is not an exception to the problems and ethical considerations that all AI tools have. Data privacy, biasing, and digital divide are common in almost all AI applications to education and need cautious attention and continued research by authorities (Ifelebuegu et al., 2023). While there are many AI tools at work in the classroom, each with particular abilities and uses, ChatGPT, however, is still way advanced in language processing and use. It, therefore, has a special place in education, particularly as a conversational tool for creating contents for comprehensive writing.

2.4.1. The Importance of Prompts for ChatGPT to Assist

The role of prompts in the use of ChatGPT cannot be understated. According to Mondal et al. (2024), a prompt is that guiding force which shapes the responses that would be obtained from the AI and is, therefore, important in extracting relevant information and ensuring accuracy. In enhancing user interaction with the AI and tailoring same towards the needs and objectives set out by the user, prompt engineering becomes very instrumental. Velásquez-Henao et al. (2023) mention that among the many reasons why this becomes so important is

that prompts assist in the clarification of a user's intent. Clear prompts and those that are as specific as possible give the AI an exact view of what it is that a user is looking to get. Such clarity minimizes the chances of miscommunication and ensures that the responses are tailored to the needs of the user. For instance, a good prompt should make ChatGPT able to respond with details, generate creative content, and advise on specific topics based on the need.

The role of prompts becomes even more significant in educational settings. According to Huang et al. (2023) well-designed prompts can increase the level of critical thinking skills. By encouraging students to go deeper into their thoughts and be more critical about the subject under study, prompts increase the chances of experiencing a deep understanding of the learned content. This is of special importance in those subjects that demand critical thinking and the capacity to assess complex ideas. Third, the success of ChatGPT underlines the appropriateness of aligning language models to human input through supervised and reinforcement learning. Xu (2023) explains that prompt engineering acts as an important tool in the probing of knowledge graphs developed by ChatGPT for effective user need handling. Developers could still allow the model to get a feel for answering queries and provide more accurate responses to the query at hand by fine-tuning the prompts used in training the AI. The lines between human input and AI output are very blurred, so this is absolutely necessary for an effortless and useful user experience.

Other studies have elaborated on different styles of prompting that can be utilized to fine-tune the performance of ChatGPT. For example in their study, Zgreabăn and Suresh (2023) examined how prompts build morphological

relationships and contextual clues to explain the processing done by ChatGPT when encountering new words. These strategies contribute to giving more context to the AI and therefore allow it to come up with more exact and nuanced responses. Integrating such methods make the potential uses of ChatGPT more efficient in different applications. Moreover, Giray (2023) expressed that the prompts are a significant component of making the responses of the artificial intelligence appropriate and relevant. Making prompts that delineate the kind of tone, style, and content limits avoid inappropriate or irrelevant responses. This becomes very important in professional and educational contexts, in which the quality and suitability of the output from an AI may make a huge difference in the user experience. With clearly defined parameters of what they are looking for, the user is then able to guide the AI toward responses suitable for expectations and requirements.

White et al. (2023) further refers to the fact that prompts can be used to personalize AI's responses with regard to audiences and contexts. In doing this, users are able to personalize results from the AI for different stakeholders by specifying the level of detail, formality, and tone desired in its output. This flexibility is also very handy in professional settings, which require the possibility of fine-tuning the AI's responses according to its audience—for instance, improving communication and collaboration in professional settings (Korzyński et al., 2023). Development of effective prompting techniques is an area of ongoing research, with new strategies and approaches continually being explored. With language models like ChatGPT increasing in their capabilities, the role of prompts to guide and shape them continues to rise (Schmidt et al., 2023). Knowing all that one can about recent

advances in prompt engineering ensures that fine-tuned handling takes place on ChatGPT to have its full potential harnessed for its user (Chen et al., 2023).

However, it should be noted that this study explores perceptions and experiences of postgraduate students only; therefore, the prompts and the extent to which the replies of ChatGPT could vary depending on them, fall outside the current study's questions and objectives. In the context of this study, a prompt is comparable to a question a student would ask a human MKO. If the question is not clear, the human MKO would not be able to help. If the question is clear, an answer is given by the human MKO based on their knowledge. In this study, students taking responses from ChatGPT is just like they would ask their teacher questions.

2.5. The Role of MKO in Higher Education

2.5.1. Traditional Concepts of MKO in Higher Education

The concept of the More Knowledgeable Other emerges from Vygotsky's (1978) Sociocultural Theory, and it has had immense contributions to pedagogies in higher education over the years. Traditionally, an MKO is defined as a human entity, mostly an instructor, peer, or expert, who has more knowledge or experience in a particular domain and assists the process of learning for the less experienced learners. The traditional higher education setting usually finds professors and instructors taking on the role of the MKO. They help the learners to navigate complex ideas, provide feedback, and develop skills in critical thinking. This, therefore, is the dynamic that characterizes various methods of teaching, such as

lectures, seminars, and mentorship programs, whereby instructors facilitate learning within the Zones of Proximal Development of students (Ness, 2022).

Another example of the MKO concept at work is peer learning in higher education. Where more senior or proficient students mentor others, examples include peer tutors, study groups, and collaborative projects. This kind of learning helped by peers not only facilitates academic success but also enhances communication and interpersonal skills (Topping, 2013). Many times, academic advisors and counselors act as MKOs as well by providing students with support in course selection, advising, career choices, and matters of personal development. This support is crucial to a student seeking to navigate the complexities of higher education effectively, making informed decisions about their academic and professional futures (Lowenstein, 2020).

Though human MKOs are important in the learning process, this approach still has its limitations. The availability of the human MKO may not always be possible; furthermore, the guidance by the human MKO may not be tailor-made to the requirements of individual students. Apart from that, the quality-of-service delivery by human MKOs is at times different depending on the expert input, the communication ability of that particular human MKO, and the relations built between the human MKO and the learners (Zachary & Fain, 2022). While the concept of the MKO has traditionally been human-centric—that is, teachers, peers, and advisors—at the higher education level, it is not without its constraints. This makes it useful to look into exploring complementary tools and methods to adopt in order to improve the learning experience.

2.5.2. Transition from Human MKOs to Digital MKOs

The evolution of educational technology has led to significant shifts in the concept of the More Knowledgeable Other, moving it from traditionally human-centric roles to digital tools and AI-based systems (Adamson & Sloan, 2021). As indicated by Cueva et al. (2024), this transition depicts one of the fundamental changes in how conceptualization and delivery of educational support/guidance are made within a higher education setting. The coming of sophisticated education technologies has been accompanied by the emerging digital MKOs (Adamson & Sloan, 2021). Such digital tools, from easy educational software to advanced AI systems, perform the role of acting as facilitators of learning. They provide information, guide, and support in different educational contexts (Cicconi, 2014). In comparison to human MKOs, digital MKOs have advantages of scalability, consistency, and 24/7 accessibility.

Artificial intelligence is particularly manifest through language models and intelligent tutoring systems, which most nearly actualizes the notion of the digital MKO. In this sense, AI systems can accommodate the needs of each learner individually and offer feedback that is relevant to them; at other times, they can converse in conversational ways, replicating some aspects of human-like tutoring and guidance (Luckin & Holmes, 2016). The integration of digital MKOs does not substitute the role of human MKOs but complements them. Pante et al. (2020) determined that digital implementation, including virtual OSCE examinations, can be an appropriate substitute for training in a classroom setting. Whiting and De Janasz (2004) pointed out the role of the internet as a mentoring tool for developing skill, while Markland and Kemp (2004) explained how to integrate digital resources

into the online learning environment to support learners. Pedro et al. (2018) emphasized that the integration of digital technology in formal educational contexts has to be done carefully to not jeopardize the classroom dynamics and quality of teaching and learning.

This turn towards digital MKOs is not without challenges. Among them, the guarantee of quality and accuracy of the information spread by AI systems, ethical concerns related to data privacy and possible bias, and finally, the human touch in the outputs that is maintained (Zeinz, 2019) are all worth mentioning. The role of digital MKOs continues to grow in the educational landscape. It is important for future research and practice to get the balance right between human and digital MKOs, one that ensures technology enhances and not replaces human elements in teaching and learning (Gupta & Jain, 2017). The rebalancing of MKOs from the human to the digital in higher education is simply reflective of the increasing digitalization of the process of learning itself. This shift thus opens up opportunities for improving educational experiences but at the same time demands that challenges and implications resulting from digital MKOs are very acutely understood.

2.5.3. The Effectiveness of Digital MKOs

Different studies and case analyses have been done to prove the effectiveness of digital MKOs in improving learning outcomes. These research efforts demonstrate practical applications and the added benefits that accrue from integration as facilitative agents in educational settings. For instance, AI tutoring systems have been applied in mathematics education. In many studies, the proof has been made that AI tutors could effectively function as a human tutor due to their

ability to deliver individual feedback and adjust the level of challenges for problems accordingly. The ASSISTments math test platform is one example that has shown high growth in mathematics by students, thus showing the potential for AI tutors to deliver customized learning experiences (Heffernan & Heffernan, 2014).

In the language learning domain, AI-based tools have been used for language acquisition and practice. One study on the use of AI-powered chatbots for language learning by Fryer & Carpenter (2006) revealed that the tools could create interactive, engaging learning environments that enhance language proficiency and motivated students to learn languages. Student motivation is paramount in language learning; thus, the efficacy of Intelligent Tutoring Systems has been highly investigated. A meta-analysis about the effectiveness of ITS that was conducted by Ma et al. (2014) concludes that the use of these tools by students leads to better learning outcomes compared with traditional instruction methods, thus showing the real value of digital MKOs in individualized education.

Recent developments in the field of Virtual Reality have opened up other opportunities for digital MKOs. Learning environments developed on the basis of VR are said to improve engagement and understanding of complex subjects like science and history. Contextual and visual cues provided by such experiences aid learning through the process and thus act as digital MKOs (Radianti et al., 2020). These case studies and research not only illustrate the potential of digital MKOs but also point to challenges in terms of quality and relevance of AI-generated content, equity of access to technology, and maintaining a balance of digital and human interaction in education (Fenu et al., 2022). In these empirical researches, case studies are presented showing the effectiveness of digital MKOs in enhancing

learning experiences across various educational contexts. These works have, similarly, been imperative in the realization of challenges that still remain inherent in the integration of digital tools into education.

2.6. Scaffolding Academic Writing and the Use of ChatGPT in It

Scaffolding plays a very important role in developing academic writing skills, which is the foundational competence in any higher education setting. This type of support takes on even greater relevance in the case of postgraduate students since at this level, students are called upon to produce advanced writing in their research and coursework tasks (Abejuela, 2017). Academic writing is a complex skill that calls for ability in critical thinking, arranging ideas in a logical and coherent approach, and following conventions that identify a piece of academic writing. It is in this light that scaffolding comes to the fore with essential assistance in helping students acquire these skills incrementally. Scaffolding, in this view, simply refers to the systematic breaking down of the writing process into manageable components going hand-in-hand with guidance in each step, thereby enabling the students to have a clearer understanding of complex writing tasks (Ferris & Hedgcock, 2023).

Scaffolding for writing has been demonstrated in earlier studies as one of the most effective techniques in improving the writing skills of postgraduate students. According to Lee (2013), it is apparent that structured scaffolding with iterative feedback and revision significantly enhances graduate students' writing. The improvement testifies to the key role of offering targeted and on-going support in developing writing skills. Thorough scaffolding in academic writing involves

modeling the writing process, clear guidelines and examples, feedback on drafts, and peer review sessions. This helps students understand what is expected of their academic writing, develop and make ideas clear, and enhance their writing abilities and style.

Scaffolding can take the form of modeling in which the writing process can be done through either live demonstration or with the provision of annotated examples of well-constructed essays. Students learn from observing all of the sequential progression for idea generation to structuring an argument for how revisions are made to drafts (Hyland, 2003). Another scaffolding technique is through the use of rubrics, which is combined with explicit guidelines for assignments. Rubrics are explicit in terms of criteria, so there is clarity given to the student about what exactly to expect and what standard needs to be maintained for the writing. Clearly stated instructions minimize uncertainty because it makes students pay attention to the most relevant elements of their work (Graham & Perin, 2007). Other scaffolding strategies that are effective include progressive drafting and peer review. This means that students should turn in drafts at each stage and obtain feedback from peers and instructors. Through this iterative process, students can continue to refine their writing skills by rectifying their weaknesses and learning all about effective writing practices (Cho & MacArthur, 2010).

Many universities have established writing centers and workshops to help students develop writing skills. These are provided through one-to-one consultations, workshops, and specialized help groups, which act as very useful scaffolding aids. According to Awada & Diab (2023), the coming of digital tools has greatly increased ease of access and convenience to the above-mentioned

scaffolding resources for writing. Online platforms, AI-driven writing assistants, and digital libraries provide students with access to extensive information and support anytime. Such an approach provides the availability of just-in-time support, allowing students to seek help on the spot when it is needed (Puntambekar & Hubscher, 2005).

The most prominent impact of digital tools is there to provide real-time feedback and support for writing processes (Purcell et al., 2013). For example, AI writing assistants are able to detect problems in grammar and style, offer revisions, and even explain what changes need to be made. As per Marzuki et al. (2023), Such real-time feedback puts students in a position to make on-the-spot improvements and thus promotes iterative writing practices. Digital tools also have the advantage of being able to customize and personalize scaffolding support. The instructor can devise assignments and resources that appropriately challenge individual students or groups. In adaptive learning systems, depending on the student's level of skill, the level of the scaffolding is adjusted to provide support in areas of weakness (Cho & MacArthur, 2010).

Bradley & Thouësny (2017) reveal online writing platforms and collaborative tools that facilitate peer review and collaboration among students. Thus, sharing drafts, giving feedback to peers, and participating in collaborative writing projects are much easier in digital settings. This kind of collaboration is one of the most important aspects of digital scaffolding, as it allows students to interact with others and learn from their peers (Strobl et al., 2019). Yet, in spite of all the very strong points that digital tools bring to scaffolding in academic writing, problems and ethical issues have also to be admitted. Plagiarism detection, privacy

issues, and overreliance on digital help are major concerns needing serious attention (Kumar et al., 2023). According to Ferris & Hedgcock (2023), tutors need to balance the act of implementing digital tools with the fostering of learners' ability to write autonomously.

Although scaffolding is essential in writing development, it is the balance regarding the degree of scaffolding applied that is very important. Too much scaffolding induces dependence and too little can be so overwhelming that make students give up. Therefore, educators need to calibrate their scaffolding strategies at any one time to align with the needs and skill levels of their students (Hammond & Gibbons, 2005). Scaffolding is no doubt a very important device in the process of learning academic writing at a higher education level. Structuring the scaffolding with integrated technological tools could, therefore, effectively enhance writing competencies among postgraduate students, adequately preparing them for advanced academic work.

This is the case with regard to the multifaceted roles that ChatGPT can play in support of academic writing, keeping nuance in the learning process and composition through a dynamic scaffolding framework. As often shown in this versatile tool, it is not only the first push in generating prompts, research questions, and thesis statements that respond to students' needs but acts a conduit for ideation and direction to such an academic journey. According to Rahman & Watanobe (2023), this tentative guidance enables the students to make adjustments to topics by providing them with a clear initiation point for critical research and writing. As students go deeper into the process, the utility of ChatGPT extends to aid in idea generation, essay structuring, and logical argumentation framework drafting.

According to Kumar (2023), this enables students to engage in a constructive dialogue for the refinement of their arguments toward coherence in their writing. Through iterative interaction, the organizing of thoughts is facilitated to ensure the construction of a well-structured and compelling narrative.

Other than these conceptual and structural aspects, ChatGPT confers strength on the mechanical integrity of academic writing. It provides real-time feedback in terms of grammar, punctuation, and style, proving to be a very valuable tool during revision and editing. Raheem et al. (2023) state that this feedback mechanism is what enhances clarity and accuracy of writing by students, stressing attention to detail. Proper citation and strict adherence to academic integrity are staples of scholarly writing. ChatGPT helps students through the complexities of APA, MLA, Chicago, and many others in ensuring references are cited properly (Marbun, 2023). This is important in maintaining standards in academics and not having plagiarized works, thereby reinforcing ethics in scholarly work.

Moreover, ChatGPT can be utilized for the research phase by proposing relevant keywords, databases, and sources, streamlining information gathering (Rahman et al., 2023). It can summarize key articles and explain difficult concepts in simple terms, thus making the research more accessible and feasible for students who are just beginning to work on their academic inquiries. The fact that this tool is able to imitate the peer-review process provides an extra layer of critical assessment. ChatGPT provides constructive feedback and asks follow-up questions that motivate students to achieve in-depth critical thinking and self-reflection on the subject matter (Rasul et al., 2023).

Oh (2023) states that ChatGPT, with its versatility features, provides field-specific guidance on writing, modifying its feedback and suggestions according to the customs and expectations of different academic areas. Students' writing is not only competent but also relevant to standards and sensibilities within their given area of study. Therefore, ChatGPT assumes a variety of roles, as mentioned above, about academic writing that are deep in impact. Acting as an ideation catalyst, structural and mechanical integrity guide, research facilitator, and reviser/mentor of discipline-specific writing, ChatGPT meets the definition of a support system that generally improves quality and effectiveness in student writing across disciplines.

While ChatGPT gives enormous scaffolding support, as pointed out above, some ethical considerations have to be addressed. Mhlanga, (2023) mentions that the AI tool puts additional responsibility on educators and institutions to emphasize responsible usage of AI tools while ensuring development of independent writing skills. Plagiarism detection and academic integrity shall be maintained). ChatGPT is able to function as a fully operational digital MKO and scaffolding agent across nearly all areas of the writing process, from generating ideas to the management of writing, grammar, citation, and research, to revising and contextual guidance. The balance needs to be maintained between digital support and skill-building.

Traditional academic writing scaffolding methods still necessitate face-to-face contact with a teacher or peer reviewer. Such practices are subjected to the schedule of the instructors or the availability of human resources. On the other hand, ChatGPT allows accessibility 24/7 and delivers support instantaneously. Therefore, there is no need for students to spend so much time coordinating schedules (Shihab et al., 2023). ChatGPT is able to afford each student personalized assistance

according to what each one needs in writing tasks. Traditional methods, such as instructions in a classroom, cannot meet all the different needs of students within one session. ChatGPT is adaptive and offers personalized guidance to the learner (Baskara, 2023). According to Raheem et al. (2023), The most prominent benefit of ChatGPT includes the potential to provide real-time feedback during the writing process. Traditional approaches are likely to mean delayed feedback since instructors or peers have to find time to go through drafts and respond. The promptness of ChatGPT encourages immediate revisions and learning.

In contrast to the conventional approaches, which may vary according to the quality of the instructor or peer reviewer, ChatGPT is uniform and standard. It ensures that every student receives the same advice using different words, thereby totally ruling out any variations in support (Javaid et al., 2023). Traditional approaches include class lectures, class discussions, scaffolding techniques, peer review, one-to-one mentorship, practice work, reading assignments, and writing assignments relevant to the development of critical thinking and independent writing skills. These are methods that concentrate on human interaction, mentorship, and deeper engagement. There are also ethical concerns about how overreliance on the tools of AI could occur, with a human role needed in education (Mhlanga, 2023).

One of the emerging trends is the integration of ChatGPT with traditional methods. For instance, instructors may use ChatGPT as a complementary tool to support human scaffolding. This kind of hybrid approach derives strength from AI and human guidance to create an all-rounded learning experience. As per Dai et al. (2023), some of the benefits associated with ChatGPT scaffolding techniques

include accessibility, individualization, real-time feedback, consistency, and standardization. On the other hand, human mentorship and the fostering of critical thinking remain strictly in the hands of traditional methods. With respect to the choice between ChatGPT and traditional means, educational context, pedagogical goals, and ethical considerations should be taken int account.

In this regard, postgraduate students seek guidance from advisors and faculty members to explain their research purpose. For this purpose, the majority of students follow the approach of personal meetings and discussions with mentors for clarification. ChatGPT can contribute to rewriting clear and logical research questions or hypotheses from the students' original ideas. The ability to converse helps the student to adjust and define the goals of the research (Marbun, 2023). Many times, postgraduate students go through the tautologies of getting relevant research articles, books, and data. The university libraries and the librarians are always available to give necessary guidelines in searching for information for the students. ChatGPT is able to offer keywords, databases, and sources of materials that can be relevant for research. It can also summarize articles and give short explanations for complicated concepts. As such, this feature helps students in the gathering of information for their theses projects (Anik et al., 2023).

Postgraduate theses require proper organization and structure. As such, faculty members can provide suggestions on how the academic paper should be organized or structured. ChatGPT can be used in outlining postgraduate theses, coming up with logical structures, and providing drafts of different sections. It offers real-time support in organizing ideas and arguments (Marzuki et al., 2023). Academic writing involves proper citation and referencing. The instructors and the

academic advisors take time to advise the students on citation styles and referencing guidelines. ChatGPT is able to guide students in formatting the citations correctly according to various citation styles. It can also be used to generate references for sources used in the paper, hence ensuring academic integrity (Marbun, 2023).

In most instances, postgraduate students mainly turn to their mentors and peer reviewers for developing the grammar and writing style. Another way is through writing centers and workshops. ChatGPT provides feedback regarding grammar, punctuation, and style in real time. It tends to be able to highlight such mistakes and correct them in the process, thus enabling students to develop the mechanics of their writing (Raheem et al., 2023). For most postgraduate students, effective time management is a common issue in striking a balance among coursework, research, and personal life. Traditionally, workshops on time management and advisors' advice help solve this problem. ChatGPT helps students in drafting schedules for their thesis projects and setting milestones. It is able to provide reminders and task management support to keep the student organized (X. Wang et al., 2023). Both ChatGPT and conventional scaffolding strategies are relevant to common writing challenges amongst postgraduate students. Traditional methods come from that human component of mentorship and resources, while ChatGPT provides instant accessible support tailored to a student.

Overall, this section provides an overview of the main theoretical framework guiding the study, which is an inquiry into Vygotsky's (1978) Sociocultural Theory and its implications for education generally and AI tools, specifically ChatGPT. Key ideas of More Knowledgeable Others, both human and digital, are discussed to show how AI-based writing assistants can provide

individualized feedback in a very adaptive way to promote better learning among students. It also discusses the scaffolding of learners toward writing for the academic genre and how highly structured support enables learners to make their way through complicated writing tasks. This chapter also reflects on some of the challenges that integrate digital tools into education, such as researching for content quality and considerations of equity in access to technology. It serves to be the overall thinking framework in realizing the possibilities that AI tools can bring to learning, based on some challenges and ethical considerations.

CHAPTER III

METHODOLOGY

The methodology employed in the study is described in this chapter, providing the clear framework set for the exploration of the role of ChatGPT as an MKO, scaffolding academic writing in higher education. The chapter starts with the description of the research method and design adopted to elicit in-depth insights into students' experiences and perceptions using a qualitative approach. The research setting, participants, and data collection techniques used are described thereafter. In the study, the open-ended questionnaires and semi-structured interviews are explained as data collection methods. The chapter further gives an explication of the data analysis techniques so as to ensure the systematization of the data-handling process for the qualitative data. Lastly, it presents validity and reliability and ethical considerations of the study, outlining how the researched safeguarded the trustworthiness of findings. This is a comprehensive methodology chapter that sets up the investigation of the capacity for ChatGPT to act as a scaffolding agent in academic writing and provides valuable insights into its use in practice and implications for learning within higher education.

3.1. Research Method and Design

The study used qualitative research methodology with a case study design in order to explore the role of ChatGPT as an MKO in scaffolding academic writing at the level of higher education. Qualitative research, according to Flick (2022), studies phenomena within social, cultural, and historical contexts. This is, therefore,

an important approach in examining new educational technologies such as ChatGPT and their impact on learning processes. Following Creswell and Creswell (2017), the aim of this study is to describe and explore the phenomenon, in this case, the use of ChatGPT in academic writing. The qualitative approach facilitates a more nuanced understanding of how, at all fine-grained levels, ChatGPT can act as an MKO toward the guidance of students in developing their academic writing skills.

The study discusses the place of ChatGPT as a technological tool in the language learning process with regard to academic writing. It investigated students' perception of the tool with regard to how it is beneficial or otherwise detrimental to academic writing. This involved the examination of students' interactions with ChatGPT, reliance on its guidance, and ways in which it informs their writing process. The focus of this research was based on the realm of higher education, directly on masters level postgraduate students, to establish how ChatGPT can aid the individual's academic writing efforts. In this regard, it forms the key to drawing useful knowledge yielding effective ways of using ChatGPT as a tool in academic writing. Understanding in-depth how ChatGPT supports and extends students' writing skills at the tertiary level, the purpose of the study was to make a meaningful contribution towards the future development of teaching and learning practices in higher education settings in relation to English for academic purposes.

3.2. Research Setting

The study was conducted within a public university in Greater Jakarta, Indonesia. This is informed by Creswell and Creswell's (2017) suggestion that

qualitative research should take place in a natural setting where participants are able to interact with the research subject under real-life conditions. The natural setting, in this case, is an academic environment where postgraduate students engage in various academic writing endeavors such as thesis projects. Given that the thesis projects are normally offered in the third and fourth semesters, research targeted students who completed or were currently doing their thesis projects.

3.3. Participants

In qualitative research, participants play a very instrumental role in offering data rooted in real-world experience (Johnson & Christensen, 2019). In this respect, this qualitative study embraced purposive sampling, as recommended by Meyer and Mayrhofer (2022) in their study to engage those participants who have direct experience with the tool being explored in the study. The qualitative nature of the research calls for thorough understanding of the experiences, perceptions, and attitudes of the students toward ChatGPT as a tool in rendering support toward students while conducting their academic writing. In this regard, purposive sampling is ideal. The research focused on postgraduate students from a public university in Greater Jakarta, Indonesia, in particular, third and fourth semester students, who have been using ChatGPT in their academic writing efforts. Thus, students were chosen in light of their exposure to academic writing and their possible experience with ChatGPT.

First, there was a preliminary stage of short interviews with close-ended questions so that it could establish how much the students are exposed to academic writing and the possibility of any experience with ChatGPT. The details of the

involvement of participants with academic writing and familiarity with ChatGPT were established. Preliminary questions on the Google Form helped filter those participants who had experience with ChatGPT. In all, there were ten students: five females and five males. First of all, consent was sought from these participants to answer the preliminary questions and they were made read the questionnaire guidelines. After that, they had to answer the questionnaires on the Google Form. At last, according to their exposure to academic writing with ChatGPT, they were invited for in-depth interviews.

The selection for the interview was based on the principle that the respondents would be able to provide insightful and detailed information about applying ChatGPT in their academic writing. Consideration was also given to their questionnaire responses, with the objective of exploring diverse perspectives on the impact of ChatGPT. The intention to focus on students in their third or fourth semester is informed by their rich experience in academic writing, especially with the task of their theses projects, which formed a requirement for the postgraduate degree. These students are at a very critical point in their journey as academic writers, and thus they turned out to be well-suited candidates to review the role of ChatGPT as an MKO in this context. Involving students who are actual writers in their academic writing, the study strives to elicit authentic insights with regard to the practical functionality and influence of ChatGPT in improving academic writing skills.

Table 3.1.

Number of Participants

Participants	Number of Participants Who Completed the Open-ended Questionnaires	Number of Participants Who Volunteered for the Interview Session
Female Students	5	5
Male students	5	5
Total Students	10	10

Table 3.2.

Participants' Level of writing

Level of Writing	Number of Participants
Non-native intermediate	4
Non-native upper intermediate	6

3.4. Data Collection Technique

Flick (2022) states that while carrying out qualitative research, it is important to select relevant instruments to obtain detailed information about aspects

of study interest. Denzin & Lincoln (2011) also affirms that comprehensive instruments such as questionnaires and interviews are basic tools for qualitative studies. In this study, open-ended questionnaires and semi-structured interviews were used as principal data collection tools. The tools focused on the use of ChatGPT in academic writing. The data analysis process used these two instruments for triangulation. According to Flick (2022), triangulation is the use of different perspectives on a given research issue, which offers ways for comparison and contrast of data sources. In the current study, the triangulation process contrasted and compared insights from these different sources of data to offer a more nuanced understanding of the experiences and perceptions of the students. Moreover, participant triangulation was achieved with the involvement of postgraduate students at different academic levels of study and varying writing levels. Through the process, participants continuously shared their views regarding their own writing, hence contributing invaluable information relating to their writing proficiency levels. Their answers, through a mixture of self-reported responses via detailed Google Form questionnaire and in-depth semi-structured interviews, revealed their level of writing (see table 3.2).

Further, where possible, the researcher viewed samples of the participants' academic writing during the interviews. The approach was therefore firmly based in participants' own reflections and answers, ensuring there was a robust understanding of each person's ability and struggles with writing contributing to this study. This approach is informed by Patton (2014), on the importance of diverse participant selection in qualitative research. The diversity of participants captured experiences and opinions on the utility of ChatGPT in academic writing. It is by

integrating the data from these multiple perspectives and data sources that this study provides an analysis of the effectiveness of ChatGPT as a more knowledgeable other in the academic writing process. It forms a triangulated approach to establish research findings, ensuring reliability and depth.

3.4.1. Open-ended Questionnaires

Open-ended questionnaires in qualitative studies offer elaborate data on the participants' experiences and views of various phenomena (Denzin & Lincoln, 2011). They give an opportunity for the participants to express themselves at length without discomfort (Creswell & Creswell, 2017). In this study, the questionnaires were designed and tailored in order to explore the use of ChatGPT in academic writing. The open-ended questionnaires in this study were designed with the help of seminal works, notably Al-Habsi et al. in 2021 (as cited in Zulfa, 2023), Kawinkoonlasate in 2021 (as cited in Zulfa, 2023), Andina et al. in 2019 (as cited in Zulfa, 2023), and Schcolnik in 2018 (as cited in Zulfa, 2023). These works guided the setting of the questionnaire instruments, which were carefully tailored to extract fine and factual insights into the role of ChatGPT in academic writing.

Aligned with a modified framework that was inspired by the aforementioned studies, the questionnaires are structured into three parts. This adapted approach is inspired from the instrument used by Zulfa (2023), in her study on tech-assisted learning media in English academic writing. The three parts of the questionnaire address: (1) the specific technology tools used by students, (2) their perspectives of these tools, and (3) the implementation of the desired tool(s) into the writing process where the tool(s) is most helpful. This structure ensures a

comprehensive understanding of how ChatGPT and similar technologies can support academic writing, from idea generation to editing.

1. Tools (3 items): Questions about the features and functionalities of ChatGPT used in academic writing adapted from Andina et al. in 2019 and Schcolnik in 2018 (as cited in Zulfa, 2023).
2. Perspectives (4 items): Questions about students' views on the effectiveness and limitations of ChatGPT in academic writing adapted from Al-Habsi et al. (2021) as cited in Zulfa (2023).
3. Implementation (3 items): Questions about how students integrate ChatGPT into their writing process adapted from Kawinkoonlasate in 2021 and Al-Habsi et al. in 2021 (as cited in Zulfa, 2023).

The total number of questions is ten, with each section serving a specific purpose in understanding the multifaceted aspects of ChatGPT's role in academic writing. To ensure the reliability and validity of the data, the researcher employed the questionnaire administration method used by Al-Habsi et al. in 2021 (as cited in Zulfa, 2023). Google Form was used as the platform for distribution.

3.4.2. Semi-structured Interviews

Semi-structured interviews are essential for obtaining in-depth, nuanced data (Flick, 2022b). They enable respondents to share their ideas more freely and cover detailed information (Creswell & Creswell, 2017). The study's interviews aim to delve deeper into students' experiences with ChatGPT in academic writing. The participants were asked to proceed voluntarily to the interviews after filling out the previous Google Forms for the open-ended

questionnaires. The interview questions were crafted, drawing inspiration from established research methodologies in Al-Habsi et al. in 2022 (as cited in Zulfa, 2023), Kawinkoonlasate in 2021 (as cited in Zulfa, 2023), and Andina et al. in 2019 (as cited in Zulfa, 2023), to ensure a comprehensive data collection that complements the questionnaire findings enclosed in the appendix.

The structure of the interviews is carefully designed to augment the data gathered from questionnaires and is comprised of 12 questions divided into three categories:

1. Tools (4 items): Further exploration of how ChatGPT's features aid in academic writing adapted from Andina et al. in 2019 (as cited in Zulfa, 2023).
2. Perspectives (4 items): Detailed discussion on students' opinions regarding the impact of ChatGPT on their writing skills adapted from Al-Habsi et al. in 2021 (as cited in Zulfa, 2023).
3. Implementation (4 items): Insight into the practical application of ChatGPT in the students' writing process adapted from Kawinkoonlasate in 2021 and Al-Habsi et al., 2021 (as cited in Zulfa, 2023).

The interviews were planned to be in-person, lasting between 15 to 20 minutes, and were recorded to ensure that no detail is missed. This approach not only respects the linguistic diversity of the participants but also ensures that the data collected is as rich and as inclusive as possible.

3.5. Data Analysis Technique

The analysis of the study followed Miles et al.'s (2014) data analysis approach, which includes three key stages in the following order: data condensation, data display, and data outcomes. This framework makes use of a three-stage process logically allowing the researcher to deal with the qualitative data collected using open-ended questionnaires and semi-structured interviews. These stages were implemented in order to elicit meaningful insights from the data regarding the use of ChatGPT in academic writing. In a study, Zulfa (2013) focused on students' experiences regarding educational technologies using this framework for interviews and questionnaires. This study succeeded in demonstrating a framework that could work well with interview and questionnaire data regarding tech-assisted writing for academic purposes, underpinning key themes from the researcher's data, and representing those findings clearly. This established framework allowed for the analysis of students' experiences of ChatGPT in academic writing, ensuring consistency and ease of comparisons with prior literature on technology in education.

3.5.1. Data Condensation

At this stage, data derived from open-ended questionnaires and semi-structured interviews were carefully selected and reduced. For the data derived from the questionnaires, the researcher picked and highlighted only responses related to ChatGPT usage in academic writing. For the semi-structured interview data, the researcher transcribed the audio recording and selected excerpts that deeply represented experiences and perspectives in relation to ChatGPT.

3.5.2. Data Display

This phase entailed systematic organization of the data obtained from the questionnaires and interviews presented in a form that best conveys the information, which is to address the research questions. Data was organized in thematic form. Also, the step involved deep analysis of data by integrating some relevant theories and studies that would enrich the discussion.

3.5.3. Data Outcomes

The final stage included synthesizing the data. Synthesis gave an all-rounded understanding of the research topic through the integration of the finding from previous stages. From the literature review to the findings and discussions, the researcher drew conclusions that brought out the essence of the study. These were then corroborated with other sources and relevant research offering a holistic perspective on the role of ChatGPT as an MKO in academic writing.

3.5.4. Analyzing Open-ended Questionnaires

Analysis of the questionnaire data involved sorting the responses according to themes related to the usage of ChatGPT. The researcher recognized patterns and variations of the students' responses in terms of their experiences and perceptions of ChatGPT. Each response category was then related to the research questions, drawing on various theories and studies for a comprehensive discussion.

3.5.5. Analyzing Semi-structured Interviews

Analysis of data from interviews followed a process of transcription, interpretation, and selection. Each interview was read line by line to extract information about the detailed experiences of students with ChatGPT. Essentially, how ChatGPT is being applied practically to write academically in relation to the theoretical framework of the study.

3.6. Validity and Reliability

As a researcher, it was my responsibility to establish the trustworthiness of the study. Trustworthiness refers to the credibility, dependability, and confirmability of research findings (Lincoln et al., 2018). In the context of this study, the validity and reliability of the data collection and analysis have to be established based on the meaningful conclusions supposed to be made on the role that ChatGPT can play as an MKO for academic writing. Validity refers to the degree by which the research embodies whatever phenomenon is under investigation (Flick, 2022). In this study, it refers to the guarantee that data collected from open-ended questionnaires and semi-structured interviews genuinely captured students' experiences and perceptions regarding their use of ChatGPT for academic writing. Reliability refers to whether or not findings from a study would be consistent across other researchers and contexts (Creswell & Creswell, 2017). In this study, the reliability is established by the adoption of a clear and systematic way through which data collection and analysis were done, thus allowing replication by future researchers.

Several strategies ensured the validity and reliability of this research. First, triangulation was put to work by applying open-ended questionnaires and semi-structured interviews in collecting data. That way, comparison and contrasting of the findings from these different sources was made, strengthening the general validity of the research (Flick, 2022). Additionally, participant triangulation was achieved by involving students coming from different academic disciplines and writing proficiency levels that they reported with the help of Google Form questionnaire and in-depth semi-structured interviews (See table 3.2). The second procedure shared the interview transcripts and key findings after preliminary analysis with participants for confirmation of their accuracy and representation of views, as suggested by (Creswell and Creswell, 2017). This process, in turn, strengthened the credibility of the study. Thirdly, questionnaires and interview guides were piloted with a very small number of students before the real data collection exercise. This pilot testing benefited in fine-tuning the instruments in terms of clarity and comprehensiveness, hence ensuring more reliable data collection (Flick, 2022). Lastly, the researcher kept a reflexive journal throughout the process to document personal biases and assumptions that would influence data interpretation. For example, the predisposition to find ChatGPT useful due to personal experience and recognizing some bias toward technology-enhanced learning solutions. To minimize this threat, the researcher was responsive to what the data indicated rather than her personal opinions. Conducting reflexive behavior promotes transparency and increases the trustworthiness of the research study (Lincoln et al., 2018). Through the application of these strategies for the study, validity, reliability, and trustworthiness were pursued.

3.7. Ethical Considerations

Informed consent was elicited from all participants before data collection, with full disclosure given to the participants on the intention of the study, procedures involved, and the possibility of withdrawing from the study at any time without any implications. The principle of confidentiality was observed by anonymizing data, and all information was stored securely. The study also followed the Indonesian International Islamic University's (UIII) ethical considerations in ensuring that research is done with integrity and respects all participants. Further, the potential risks against benefits of this study were weighed to ensure the safety of the respondents. At a personal level, participants might have benefited from ChatGPT by learning something new about their writing processes. However, some of the probable risks involved the possibility that participants would experience emotions of embarrassment or anxiety in having to describe their problems and experiences in writing. To this end, all the participants were anonymized, and response confidentiality was guaranteed. Approval for data collection was also requested and granted by the university, thereby further demonstrating the study's dedication to ethical research practices. In dealing with these issues of ethics, the research attempted to provide a parameter for ethical integrity in the research findings to have trustworthy credibility.

CHAPTER IV

RESEARCH RESULTS AND DISCUSSION

This chapter focuses on the analysis and interpretation of data collected from the perspectives of postgraduate students on their experiences with the use of ChatGPT as an MKO in scaffolding their academic writing. The aim of this chapter is to provide the findings and discussions regarding the benefits and challenges identified from using ChatGPT, based on the postgraduate students' experiences and perspectives, besides discussing their expectations and desires about further improvements in the use of ChatGPT within their academic writing processes.

4.1. Research Results

The study results on postgraduate students' experiences of using ChatGPT as an MKO to support their academic writing are presented in this part. The findings derived from the data collection are shown in the following section.

4.1.1. Research Question One: Students' Experiences with ChatGPT

The research question explicitly requested information from the participants regarding their views on how ChatGPT contributes and aids an individual in the writing experience for academic purposes. The discussion was conducted to understand the elements that elucidated the perception of students with respect to

the implementation of ChatGPT in enriching and optimizing their academic writing. The discussion is detailed as follows:

4.1.1.1. Benefits of Using ChatGPT as an MKO

Enhanced Writing Skills and Knowledge

Grammar and Syntax Improvement: The most evident advantage that the students derived from ChatGPT was an observable improvement in the grammar and syntax of their writing. This substantiates Vygotsky's (1978), Sociocultural Theory, which opines that the role of the MKO is to mediate the developing mind through social interaction and scaffolding. ChatGPT responds with detailed feedback on grammar mistakes, incorrect sentence structures, and a few other linguistic issues. Through these, students could work on refining their writing techniques. This was particularly useful for non-native speakers of English who are often perplexed by all of the rules and exceptions of English grammar. According to Palincsar's (1998) notion of scaffolding, ChatGPT acted as a tool that provided immediate correction for students to learn from their mistakes and carry the learning through to future writing tasks. One participant said:

> "ChatGPT helped me understand the nuances of academic writing better, especially with grammar and sentence structure. It pointed out specific errors that I had been making repeatedly, like incorrect use of tenses and subject-verb agreement, and provided clear corrections. Over time, I noticed that I was making fewer mistakes and my writing became more fluent and accurate," stated by participant no. 10.

This constant exposure and interaction with ChatGPT enabled the internalizing of rules of grammar to occur in much the same way as Wood et al.'s (1976) scaffolding model, whereby, as tasks are mastered, the learner progresses toward autonomous self-development. This approach served to enhance the ability in sentence structuring and made what the students wrote clearer and more incisive. This continuous interaction with ChatGPT made it easier to handle grammar and syntax complexities, thereby exemplifying gradual release of responsibility. In a way, ChatGPT's correction mechanism also correlates with the verbal instructions and written feedback modes of scaffolding that Dennen (2013) discusses. In this context, the students were given explicit corrections and suggestions for a more complete understanding of their linguistic errors and how to make informed revisions. This iterative process enhances their writing ability in keeping with the educational objective of creating independent, proficient writers.

Stylistic Elements: In addition to grammar and syntax, ChatGPT provided valuable suggestions on the stylistic elements of tone, clarity, and coherence. The ability to express ideas through effective style marks a high degree of writing competence, very well aligning with educational theories of writing development. It did this by giving feedback to students to maintain a uniform tone, avoid redundancy, and enhance readability overall. ChatGPT's role in enhancing these stylistic features can be understood in relation to the scaffolding principles as articulated by Palincsar (1998). The AI tool provided immediate, targeted feedback about style that the learners would use to develop the skill of editing writing for the

purpose of creating engaging and effective pieces. One student shared the following:

> "The suggestions improved my essays and were quite easy to implement. One example is that I always felt a failure of maintaining the same tone in my essays. ChatGPT detected the lines that my tone suddenly changed and showed examples of how to achieve a more uniform voice," stated by participant no. 10.

This process is also illustrative of the model of scaffolding. As students applied the suggestions given by ChatGPT, they unconsciously internalized such stylistic principles which helped them in independently producing well-crafted writing. Moreover, the style enhancement power of ChatGPT underlines the role of feedback in the learning processes. The suggestions given by ChatGPT made students aware of and corrected the flaws in their styles, thereby enabling them to grasp effective writing techniques. This square well with educational best practices for developing writing ability through an iterative process of feedback and revision.

Structure and Organization: This dimension proved critical and instrumental wherein ChatGPT aided logical linking of ideas to support the production of coherent argumentation. This is an underpinning skill, as has been noted from the literature review, by Lee (2013) and Ferris and Hedgcock (2023). ChatGPT guided essay structure by supporting the process from an initial phase of brainstorming, making a structured outline to nuanced phases of refinement in organization

concerning draft phases. By so doing, ChatGPT helped the students put their thoughts into coherent written pieces.

As it was pointed out in the introduction, the scaffolding in education means that students are given structured support, which gradually decreases when students become more proficient (Wood et al., 1976). ChatGPT enriches this approach with its immediate responses and suggestions in this area, guiding students through all the pitfalls of writing an academic paper. For instance, one student responded that ChatGPT helped the student organize their writing assignment:

> "It helped me to put my thoughts in order and structure my essays more logically. While I was working on the assignment, ChatGPT suggested a clearer sequence for the presentation of arguments. It guided me about outlining the assignment with an introduction, body paragraphs, and a conclusion. This not only resulted in a better flow of the assignment but also enhanced the coherence of the arguments," stated by participant no. 2.

By using ChatGPT, students improved the structure and organization of their academic writing and, in that respect, gained clarity and persuasiveness. This improved their chances of success in their academic writing endeavors.

Personalized Learning Experience: Another great advantage was that ChatGPT could provide individually tailored feedback, adjusting to different styles of writing. The AI tool can provide tailored feedback, adapted to the peculiarity of every student's writing style, which places it within the theories of education that

stress personalization in learning. Given that learners' needs vary greatly, addressing them with personalized feedback is found to increase learners' motivation and raise their performance in the literature review (Brown et al., 2020).

For example, the feedback mechanism of ChatGPT identifies elements that are peculiar to student's writing and suggests relevant ideas that are peculiar to their needs. By personalization, feedback makes applicable and actionable feedback. Work by Graham and Perin (2007), has exemplified that writing skills are improved significantly by tailoring the feedback provided. One student explained this benefit as follows:

> "ChatGPT feedback was very useful. It felt I have a personal tutor always available. I remember while writing my essay, ChatGPT remarked that I was using complex sentences and recommended the simplification of some of the passages to ensure readability. This made my essay clear and also enabled me to keep my unique voice," stated by participant no. 3.

This type support not only makes the learning experience more relevant and engaging but also enables students to take responsibility for the development of their writing. As suggested by Vygotsky's (1978), ZPD, this kind of individualized support effectively scaffolds student learning toward growth and independence. Thus, ChatGPT provides individual feedback to make the educational journey much more meaningful and engaging; students can thus empower themselves toward their academic goals by cultivating their unique writing styles.

Examples and Explanations*:* Students also appreciated that ChatGPT provided explanations and examples. Students reported that the AI did not just highlight mistakes or suggest improvements; it also often provided explanations and examples to clarify its points, as if requested to improve their understanding and application of the feedback. This finding corresponds to those of Brown et al. (2020), in which it is maintained that for writing proficiency, clear and instructive feedback is necessary. For example, one student noticed this clearly:

> "I really liked how ChatGPT explained everything and gave examples. It made clear how to improve my writing. Upon receiving feedback on my essay, it explained why my thesis statement needed to be more concise and gave an example of how a revised statement could sound. This not only made the problem clear to me but it also helped me build a better thesis in my subsequent essays.," stated by participant no. 4.

It is an approach that fully embodies the theory Vygotsky (1978) put forward: the More Knowledgeable Other, who scaffolds to cover current demonstrated and potential abilities of the learner. By giving detailed feedback relevant to context, ChatGPT acts as an MKO in helping students internalize writing principles and develop the capacity to apply them on their own in future tasks. The literature review supports this contention noting that well-structured examples and clear explanations can make a huge impact on student learning and retention.

Moreover, the role of ChatGPT in providing example-based feedback that is tailored makes the writing process much more effective and efficient in enabling

students to meet and transcend academic standards than those of their present capabilities. This detailed and personalized mechanism for feedback not only helps the student refine their present work but also equips them with learning and skills as to why such mistakes should be shunned in the future. According to Brown et al. (2020), this iterative process of receiving and grasping feedback, facilitated by examples, enables students to progress toward ever more sophisticated and nuanced approaches to writing.

Increased Confidence and Independence

Real-time Support: Another major benefit of the support afforded by ChatGPT was that it was immediate. In the case of writing problems, this immediacy in ChatGPT makes students' issues addressed right on the spot, building confidence and decreasing frustration. This immediacy allows one to move beyond the difficulties immediately without a long break, a key ingredient in keeping them interested and on task. As one student commented:

> "It is the confidence inspired by using ChatGPT that has made me feel capable of doing complex writing tasks. Real-time feedback aided in clarifying thoughts and keeping on track without losing momentum when I was quite unsure about how I should structure my introduction for the research paper," stated by participant no. 1.

This immediate support not only increases the pleasure of learning but also mirrors principles of scaffolding in educational theory. As explained above,

according to Vygotsky (1978), learners make use of the support provided by more knowledgeable others, which in the case of ChatGPT is given through timely guidance and feedback. With instant help, students are able to effectively traverse any writing challenge, thereby bridging the gap between the learners' current abilities and possible potentials (Graham & Perin, 2007).

Informed by Bandura's (1997) social cognitive theory, students self-efficacy rests on the idea that students develop a sense of accomplishment and build confidence in their ability to write from immediate feedback and support, which ChatGPT did in this case. It provides motivation to engage deeper with tasks at hand, which aligns with the educational goal of promoting agency and autonomy among students in learning.

Reduction in Dependency on Human Supervisors: Students had less reliance on human supervisors because ChatGPT could take care of the basics. This is consistent with most modern educational theories in ways that can be identified as computer-aided optimization of human resources within a learning environment. As noted above, giving the student autonomy to manage foundational writing tasks alone offered a better use of time for supervisors in the execution of more complex parts of the work. Through this shift, students gained more control over their learning process, a fact nicely captured by Bandura's (1997) social cognitive theory. One of the students put forward this benefit:

> "I didn't have to rely on my supervisor for every small thing using ChatGPT. I could do the basics all by myself, which apart from raising my confidence level in this work, gave me an opportunity to make better use of my

supervisor's time. This improved my overall productivity and enhanced the quality of my work," stated by participant no. 3.

This testimonial tells how ChatGPT helped the student to become owners of his/her learning processes in order to foster self-managed learning skills for lifelong learning (Palincsar, 1998). In using ChatGPT to automate routine writing tasks, supervisors can place their efforts on providing deeper and more nuanced feedback that enhances students' understanding of how to apply complex academic concepts.

This decrease in reliance on human supervisors exemplifies the scaffolding theory in action, where learners progress gradually toward independence as they master the fundamental skills through the help provided by more knowledgeable others. ChatGPT acts as an electronic mentor to the students in that regard, helping them gradually take up academic prudence by handling routine tasks autonomously. It enhances the educational technology to support differentiated instruction, so that at all times, the needs of the students are met. Using ChatGPT for basic writing tasks could be an opportunity for educators to really maximize their instructional practices in higher-order skills and critical thinking development.

Empowerment Through Self-Editing: ChatGPT empowered students to enhance their ability for self-editing and refining their work without external help. Such an ability of ChatGPT is a major improvement in support tools for education, aligning very much with those educational theories focused on learner autonomy and self-efficacy (Bandura, 1997). By providing feedback and guidance on writing mechanics, ChatGPT enabled students to revise independently with respect to the

linguistic mechanisms of the writing only, without reliance upon traditional MKOs, promoting a feeling of competence and confidence in one's writing abilities. Because it is an AI playing the role of an MKO to help develop self-editing skills without any human MKO, this enables students to find and correct errors by themselves through interaction only with the digital MKO, as is clear from the feedback of one student:

> "Editing my work with the help of ChatGPT made me feel more able and confident in writing. ChatGPT pointed out areas where my reasoning was less clear and suggested ways of structuring paragraphs effectively when I wanted to organize my arguments for an assignment," stated by participant no. 10.

This becomes a very important testimonial in explaining how ChatGPT helps students become more autonomous writers who stick only to digital MKOs. Here, the AI tool takes up the role that functions as a support aid for editing. Students achieve gradual mastery through iterative feedback and practice. Personalization of learning experiences is also underlined with empowerment through self-editing. Tailoring the feedback to each writing style and weakness makes the instructional support from ChatGPT more effective, meeting the needs of diverse learners better than conventional approaches. This cultivates a growth mindset, as students grow to see challenges in writing as stepping stones for improvement rather than stumbling blocks. Through the feedback mechanisms in

ChatGPT, learners increase the quality of their writing and simultaneously enhance their capability to be resilient and persistent in their academic pursuits.

Enhanced Problem-Solving Skills: The use of ChatGPT also enhanced the problem-solving skills of students. In cases of difficulty while writing, the students began using the feedback provided by ChatGPT to chart a course toward a solution and improvement independently. One participant explained this aspect of problem-solving:

> "ChatGPT empowered self-confidence in me to solve writing problems alone, which was very empowering. It guided me through techniques and strategies that would give meaning to structure, tone, and clarity. With it by my side, I felt more confident in my ability to do any writing challenge on my own, making the whole process of writing enjoyable and fulfilling," stated by participant no. 5.

On this point, ChatGPT acts as an assistive agent, helping the student negotiate through challenging writing tasks within their ZPD. This in turn furthers the students' growing ability to solve writing problems on their own. Its role in this aspect thus echoes literature that points out AI-based educational tools for their potential to improve learning outcomes with adaptive support and encourage self-managed learning (Luckin & Holmes, 2016). Through real-time improvement suggestions on argumentation, structure, and clarity of writing, ChatGPT encourages the iterated problem-solving process. In this sense, this is an approach

towards developing resilience and critical thinking skills through the continuous refining of ideas and arguments in interaction with the tool (Lee, 2013).

Time Efficiency and Convenience

24/7 Availability: Another very interesting feature of ChatGPT is that it is available all the time, and students are able to get assistance whenever they need it. Particularly among postgraduate students, this helps those who have different commitments that change every week. No waiting for office hours or scheduled meetings, ChatGPT is always available for students to acquire the help they desire. One student responded:

> "ChatGPT was always there to help me out, and this really saved me a lot of time. I mean, if it is available all the time, I'm able to get instant solutions to my writing questions, hence avoiding delays that may drag my projects behind schedule. Such convenience makes the writing process much more efficient and allows one time and energy to refine ideas and work on perfecting the skill with no unnecessary interruptions," expressed by participant no.6.

This is an element of ChatGPT that fits very precisely with the idea of scaffolding in educational theory, through which structures of support are built to meet learners' needs at various points in their development (Wood, Bruner, & Ross, 1976). The presence of ChatGPT serves as a kind of digital scaffold, providing

support to students for finding their way through challenges in their writing process, similar to the expert other who here is always available.

Furthermore, the literature on educational technology reveals that flexible and accessible learning tools increase student engagement and success (Luckin & Holmes, 2016). ChatGPT being available 24/7 reduces transaction costs of time between the need for and the availability of assistance, thus empowering students to use their time effectively and maintain momentum in the pursuit of their educational goals. This perpetual access not only aids their immediate writing needs but also creates an atmosphere of self-motivation towards learning, whereby students are helped as soon as problems are encountered.

This perpetual availability of ChatGPT, from an educational point of view, further promotes the development of self-directed learning among students. It encourages them to take responsibility for the learning processes by working independently with resources and seeking help as needed, rather than simply relying on structured contact with human MKOs. This is a critical component of lifelong learning skills for the student, proving to be beneficial in any future workplace where there is a large premium placed on independent solution-finding and acting on initiative.

Increased Productivity: Students reported that the convenience and time-saving features of ChatGPT led to increased productivity. The ability to work uninterrupted and receive immediate assistance enabled them to produce more work in less time. One student noted:

> "I was able to write more efficiently and get more done because I didn't have to wait for feedback. With instant responses from ChatGPT, I could actually

address and improve in real-time, streamlining my workflow. This very instant feedback loop not only enhanced my productivity but also boosted my confidence level in my writing ability, hence enabling me to produce quality work in less time," stated by participant no.1.

Literature identifies the closest related factors to productivity in an academic setting as time management and the effective use of available resources (Fauzi et al., 2023). Now, ChatGPT can provide help and instant feedback. Keeping this in mind, students can stay on track and move through writing tasks without the delays of traditional feedback cycles.

Streamlined Workflow: ChatGPT helped in smoothening the workflow in giving feedback. Students could develop a regular writing routine without disrupting it due to this consistency. One of the participants remarked:

"The fact that ChatGPT was always there to assist me in writing kept me on the right track. Its availability in quick problem solving helped me not to lose any momentum, thus avoiding delays. It made my workflow smoother and ensured on-time completion of work," participant no.7.

This lean workflow allowed students to channel energies into the substance and quality of writing, rather than some of the logistical challenges (Wood et al., 1976). It reduced the opportunity for interruptions and offers constant feedback, making ChatGPT a focused approach to writing tasks for deeper engagement and refinement in writing skills. This tool possesses an ongoing feedback loop, which

aligns with theoretical frameworks of sociocultural theory and scaffolding because students are enabled and supported autonomously in self-managing processes of writing while getting continuous support, thus promoting self-regulated learning and development (Palincsar, 1998).

On-Demand Assistance: Another high-valued feature was the just-in-time feature of the help coming out of ChatGPT. The students could get help exactly when it was needed, thus dealing with certain problems as they arose. One student said:

> "Being in a position to get assistance exactly when I needed it was quite convenient and thus made the writing process easier. With all challenges addressed immediately, I could move on to my projects right away. Such convenience not only saved me time but also enriched the quality and productivity of my writing efforts," stated by participant no.4.

The ease of incorporating on-demand support into learners' writing processes makes them more efficient and effective. It minimizes the time wasted due to disruptions and maximizes the time available for actual learning, as students can solve challenges in real-time—a feature critical in handing complex academic tasks such as writing a thesis effectively (Wang & Li, 2008). This ability expresses the educational goal of raising independent learners with the capacity to navigate and master content with relevant support. This further deepens the integration of technology in education and underlines the potential that AI can demonstrate by

changing the ways in which students learn and acquire skills within contemporary educational settings (Mohamadi et al., 2023).

4.1.1.2. Students' Expectations and Desires for Improvements in ChatGPT

Enhanced AI Capabilities

Handling Complex Writing Tasks: Students expressed a keen desire that ChatGPT should be able to offer more nuanced feedback on complex writing tasks. Even as the AI performed fine on simple and middle-level tasks, students believed its feedback could be more comprehensively done for both intricate and high-level academic writing. These would have made the students tackle more sophisticated assignments with an assurance of understanding. As one student aptly put it:

> "I would appreciate more detailed feedback from ChatGPT on complex writing tasks, for instance, my thesis analysis. For example, during my thesis, I sometimes became very unsure about coherence of my arguments and clarity of my interpretation of data. ChatGPT could have helped me fine-tune these aspects had it given me more nuanced feedback," stated participant no.3.

Also, students wanted more detailed feedback on complex writing tasks. This wish seems to be based on scaffolding; many expect that ChatGPT should be able to provide students with support not only in simple and intermediate writing processes but also in complex academic writing. In this expectation, it is argued that

learners require personalized support to be exposed to a gradually increasing level of task complexity (Wood et al., 1976).

This gap in AI's feedback ability is well represented by the student above who has been through the thesis writing process. Students identified that they most struggled with the coherence of the argument and clarity in the interpretation of data; further, and more granular, feedback from ChatGPT at these junctures would have significantly contributed to the refinement of their thesis. This scenario is an example of the way AI should take up a digitally complementing role to traditional educational roles—ones in which scalable support might be given toward varying academic needs of students.

Deeper Analytical Feedback: The students also had high expectations of ChatGPT with regard to providing deeper analytical feedback. They wanted to see improvements in the capacity of the AI to analyze and comment on advanced academic work—offering insights that would be more subtle and reflective of complexities involved in writing at a higher education level. This would help students grasp the deeper aspects of their subjects better and develop analytical skills. One participant noted:

> "The enhancement of its ability to analyze and critique more advanced academic work would benefit. If it is improved to give detailed feedback on more complex topics and higher-level writing, then it would be of much greater use to researchers, students, and professionals. After all, such development may bridge the gaps in understanding and provide valuable

insights that complement human expertise in a great enrichment of the academic writing process," stated participant no.5.

This agrees well with the scaffolding argument that advanced writing requires very fine and granular feedback in developing a skill. As evident in the literature review, effective scaffolding is not about the mere correction of superficial errors, but deep insight provision to let students understand and manage their way through complex academic requirements (Ferris & Hedgcock, 2023). By providing this depth of analytic feedback, ChatGPT can have the potential to contribute to the development of better academic writing. This kind of capacity positions itself within the broader educational context of using digital tools to supplement and augment human instructional approaches. As discussed in the literature, this move from human MKOs to digital MKOs is one of capitalizing on AI's strengths for individual, scaled, and consistent levels of support (Luckin & Holmes, 2016).

Integration with Human Feedback

Combining AI and Human Feedback: AI integration with human feedback emerged as a critical component that supportively helps the student at all levels. This approach of hybridity exploits the respective potentials of both an AI and a mentor, thus fitting it in the frame of scaffolding, as described in educational theory. Proper scaffolding, as pointed out in the literature, consists not only of the amount and regularity of the help offered but also of individual, context-based perceptions,

handling the needs of students individually at an advanced level (Ferris & Hedgcock, 2023).

Students clearly prefer the system where ChatGPT's immediate and consistent feedback is enriched with the nuanced and context-specific insight of the human supervisor, an integration reflective of the educational perspective linking technology with human expertise in making a more holistic system of support. One of the students explained this as follows:

> "Combining it [ChatGPT] with regular feedback from supervisors would be perfect. In this way, one can only reap the instant support and efficiency AI has to offer but at the same time get the sophisticated views and personalized mentorship that only human supervisors can give. Together they would be able to build a support network of completeness, enhancing both quality and depth for this writing process," stated by participant no.10.

This approach is in line with Vygotsky's (1978) Sociocultural Theory, where learning is a socially mediated process and needs an MKO for guiding learners through their ZPD. In this case, ChatGPT can function as a kind of digital MKO, providing reliable and scalable feedback, while the human supervisor can offer deeper guidance in a more personal and nuanced way to address the specific challenges and subtleties of student work.

Best of Both Worlds: ChatGPT, added with human supervision—was considered to have the best of both worlds. Students felt that such a system would optimize their learning and growth by utilizing the strengths of both. While ChatGPT could take care of routine feedback and offer real-time help, human

supervisors could provide detailed critical appraisals and mentor students through the more complex aspects of writing. As one participant put it:

> "A hybrid approach in which AI and human supervisors are used would be the best of both worlds. This methodology combines the efficiency and immediacy of the AI with the nuanced insights and personalized feedback from the human supervisor. By using both resources, writers can create far greater quality work to support their writing process," stated participant no.3.

AI and human feedback would therefore drive an autonomy-and self-regulation-rich learning environment. Whereas the effectiveness and accessibility brought by AI tools, human supervisors develop deeper levels of engagement and provoke students to think critically about their works. This two-way support structure is not only instrumental in terms of the quality of academic writing but also very relevant for scholarly research and professional development.

This, in practical terms, can largely benefit the educational institutions that have embraced this hybrid approach. By marrying AI strengths with human intelligence, a good position in which the institution can be to better create a more robust support infrastructure that meets the diverse needs of postgraduate students. This enables students not just to produce quality writing outcomes but also empowers them with confidence and competence to tackle any complexities within the discipline.

Personalized Learning

Adapting to Writing Styles: The students also indicated that they would like ChatGPT to understand their writing styles and academic requirements at an advanced level. While realizing the utility of AI in providing feedback, students mentioned that it was important to develop the tool so that these suggestions are varied based on their different voices and preferences. Much of this customization would enhance the relevance of feedback and help them in developing the skills without losing their unique writing styles. One of the students mentioned this in the following words:

> "It would be nice if ChatGPT were more attuned to my own style and writing preferences. If it really got attuned to my particular voice, writing habits, and created answers accordingly, that would make the help offered much more relevant and seamless. This level of personalization would be great to bring about an overall enhancement of the writing experience with this tool, making it even more effective and user-friendly," stated by participant no.10.

This is a demand for personalization within an educational vision that values students' choices and the academic identity of every individual. Learning, according to constructivist theorists, takes place in the best possible way within contexts tailored to the diverse needs and preferences of learners (Palincsar, 1998). ChatGPT can be even more engaged into teaching when catering to the writing styles so that

students feel supported while trying to develop their skills without losing their real voices.

Tailored Feedback: Students particularly stressed that the responses from ChatGPT have to be personalized with regard to previous work and improvements. The participants looked at the feedback as significant in the light of the past submissions and improvements; they felt it is necessary for continuous development. In such a way, they would help themselves use the fact of their already acquired strengths and systemically exclude the constantly found weaknesses. One of the participants expressed in in below words:

> "It would be very nice to receive feedback based on my history of work and progress. Having the guidance individualized by my previous writing and development, ChatGPT can give more relevant advice," stated by participant no.7.

Such an expectation fits quite well into the constructivist approach, with the idea of building from prior knowledge and experiences. If feedback that did not forget the developmental trajectories of the students was integrated, ChatGPT would become a corrective tool with the added advantages of providing continuous improvement and reflective practice. From the learning perspective, learners are active in shaping their learning paths in the light of iterative feedback (Palincsar, 1998). Such feedback also aligns with the principles of formative feedback from MKOs by tailoring the feedback to reflect students' progresss (Sosibo, 2013). In

providing insights that recognizes a students' growth over time, traditional or digital MKOs are better placed to help learners recognize patterns of improvement and thus fine-tune strategies for success. This process improves their writing ability and gives them a sense of control and ownership over the process of learning.

4.1.2. Research Question Two: ChatGPT as an MKO to Overcome Writing Challenges

For the second research question, the participants were asked about how ChatGPT had helped them get through different writing challenges using scaffolding. This was meant to capture an all-inclusive understanding of the practical benefits and usages of ChatGPT in the process of overcoming certain writing difficulties. These writing difficulties range from writer's block, generating new ideas and giving instant suggestions to improving research, developing content, and language use. The different ways in which ChatGPT has assisted students in practically crossing over these barriers are enlisted herein, showing how the bot serves in overcoming these difficulties.

Addressing Writer's Block

Idea Generation: ChatGPT helped students in the area of developing ideas and therefore helping them to get over writer's block which is defined as the frustration brought about by an inability to begin writing immediately. ChatGPT resolves this dilemma by offering students a constant stream of ideas to explore and build upon. The AI creates a variety of topics and angles relevant to the assignments

that students are working on, allowing for them to have some location from which to start. This is very helpful in cases where students cannot think of ideas by themselves or simply need a jump-start in their writing. For example, one student said:

> "Whenever the writer's block came, ChatGPT always helped me to come up with new ideas and directions for my essays. Its ways of suggesting new perspectives and creative ideas drove me out from the troubles and got me back into continuing writing. This support was invaluable to keeping my productivity and ensuring that I would be able to develop my ideas," stated participant no.3.

By providing diverse and innovative suggestions, ChatGPT empowers students to overcome mental blocks and initiate their writing with renewed enthusiasm and clarity. From an educational perspective, this functionality supports the principles of scaffolding and cognitive apprenticeship, where learners benefit from structured support to advance their skills. By guiding students through the initial stages of idea generation, ChatGPT fosters confidence and independence in their writing processes. This approach reflects a proactive stance in educational technology, leveraging AI to enhance student engagement and productivity.

Prompt Suggestions: By informing prompt suggestions, ChatGPT was able to help students break through mental barriers to get started with writing. From a pedagogical point of view, this feature inlays the conception of scaffolding and cognitive apprenticeship, in which learners are given guided assistance to progress

in their skill-building efforts. Standing with students at this most initial point of generating ideas, ChatGPT instills confidence and autonomy in their writing processes. This could be considered to be the attitude of initiative in educational technology, applying AI to help increase students' interest and productivity. One student put it as below:

> "The suggestions from ChatGPT really provided me with the boost in creativity to get writing again. By being very creative and having different prompts, they really help kindle ideas and give a push one needs to resume momentum. This feature kept my writing process up and running by its dynamism and engaging nature," stated by participant no.6.

By encouraging students to reflect critically on their topics, ChatGPT helped to develop thinking skills necessary for academic achievement. On a practical level, these prompt suggestions work as initiators in students' minds, through which they arrange their thoughts to articulate meaningful content. They facilitate the translation of abstract ideas into coherent, well-articulated content that can be further expanded and developed throughout the writing process. This enhances not only the writing fluency of students but also their potential to express complicated ideas clearly and persuasively.

Enhancing Research and Content Development

Information Retrieval: One major way that ChatGPT helps graduate students is during the researching phase. It provides effective information retrieval,

whereby credible sources and relevant information form an essential module in the process of writing an academic paper. This exercise is usually quite time-consuming and somewhat hectic. ChatGPT helps streamline this by providing students with a bulk of information in a quick and accurate way. It is then able to suggest keywords and identify key concepts, even directing students to specific sources relevant to the research topic in question. This greatly saves students' time and effort in information gathering, allowing more focus on analyses and content development. For example, one of the students noted:

> "ChatGPT assisted me in finding credible sources and relevant information for my research papers by quickly recommending authoritative references, which streamlined my research process," stated by participant no.4.

The tool suggested keywords, identified key concepts, and guided the student to relevant sources. Thus, the process of research becomes easier, and time and efforts to find credible information were reduced. According to Siemens & Baker (2012) and Stojanov (2023), scaffolding principles can be noticed through ChatGPT due to its adaptive support tailored to students' research needs. Such incremental guidance helps students to better navigate the often overwhelming landscape of academic literature, with more time devoted subsequently to critical analysis and development of content.

Content Expansion: Other than information retrieval, ChatGPT is good at helping students elaborate on ideas and more fully develop their content. Once students have a basic outline or starting points about ideas, the AI can give

suggestions for how to further that point and add depth and detail into their arguments. This feature helped the students, particularly those who sometimes struggle to develop their ideas or who may need some aid in the better argumentation of what is being written. ChatGPT offers numerous angles and viewpoints that might elude students, thereby improving their content and strength in arguments. One student shared:

> "ChatGPT helped me expand on my points and take my arguments to a bit more depth. Its insight and suggestion allowed me to develop ideas that provided a richer point of view regarding my writing. This was an invaluable assistance in strengthening arguments and improving the general quality of work," stated by participant no.3.

ChatGPT's role in content expansion is a clear example of the way in which this tool acts as a scaffold for academic writing. The instrument provides the student with step-by-step help in articulation and expansion. With suggestions for elaboration representing diverse perspectives and enhancing the development of deeper analytical thinking, ChatGPT increases both depth and quality for arguments that students develop. Finally, empirical evidence underscores that AI technologies take their leading role in transforming educational practices. To this end, ChatGPT enables students to negotiate academic tasks, improving their learning outcomes.

Language and Style Improvement

Vocabulary Enhancement: ChatGPT also assisted postgraduate students is through the suggestion of improvements in vocabulary and alternatives, thereby significantly improving the quality of writing as a whole. Rich and varied vocabulary characterizes effective academic writing, which seeks to convey the intended ideas with greater precision and persuasiveness. ChatGPT also provides synonyms and advanced choices of words as substitutes for simple ones, or repeated usages raise the level of language in students' essays and research papers. This facilitates not just better readability of the text but is also reflective of better linguistic ability. For instance, one of the students stated:

> "ChatGPT helped me to enhance the language and style of via synonyms and alternative phrasing, it allowed me to make necessary adjustments to my expression in order to attain a more refined writing style," stated by participant no.8.

The implementation of ChatGPT within the learning environment is part of a larger initiative: the use of technology to better student outcomes. Along with synonyms and very advanced word options, it enhances readability in essays and research papers, giving students' writing professionalism and polish. It is part of the pedagogical imperative to offer students linguistic resources for conducting scholarly discourses and critical engagements (Roschelle et al., 2000; Salomon et al., 1991).

Tone and Formality Adjustments: Apart from enhancing vocabulary, ChatGPT helped students modulate the tone and formality of their writings toward

what is most appropriate. Academic writing takes a formal tone, usually at a level of formality that students would not use in everyday life. ChatGPT helped in guiding the tone of the language and style of writing. This includes suggesting more formal word choices, rewording colloquial expressions, and ensuring that the tone overall is appropriate for scholarly work. One student brought out this benefit by saying:

> "It helped me to put my writing in a formal tone, suitable for an academic work. Its suggestions on language and structure helped maintain a scholarly tone in the writing. In this way, ChatGPT enabled me to express myself effectively in my academic writing tasks," stated by participant no.5.

The tool did so through formal word choice suggestions, rephrased colloquial expressions, and tone adjustments. In this way, it helped students work through the complexities involved in academic writing, especially for those students who might be writing in a second language or adjusting from very informal to formal writing. The role of AI in dealing with tone and formality adjustments explicitly aligns with the stature of students toward meeting the standards expected in academic communication. By guiding students toward language that is appropriate in a scholarly discourse, ChatGPT increases the credibility and impact of arguments, hence encouraging closer engagement with the academic content at hand.

Structural and Organizational Support

Outline Creation: ChatGPT assisted postgraduate students in drafting the outlines for academic essays. The outline is essentially a blueprint during the writing process, whereby thoughts and ideas are set out in a coherent flow of arguments. ChatGPT helped in this process by suggesting a logical flow of sections and sub-sections, ensuring that all major areas to be covered are picked out in such an orderly way. This is support that is invaluable to students who struggle with getting their writing started or keeping the focus sharp throughout the work. One student said:

> "An outline generated using ChatGPT really helped in the organization of thoughts and structuring of the paper. Its generation gave me a cohesive framework for ideas. This was particularly very useful to ensure the flow of my paper," stated by participant no.10.

According to Ferris and Hedgcock (2023), scaffolding refers to the making of a complex task simple by breaking it down into manageable bits which learners can easily progress through towards the final goal of learning or development. By offering students a reasonable order in which the sections and sub-sections should follow, ChatGPT gave them an opportunity where students could cover all the requisite points in a way that builds their skills at structuring arguments effectively.

Logical Flow: ChatGPT provided coherence and flow to academic writing tasks; these are two primary ingredients of effective scholarly communication. Clarity and structure of one's ideas are, therefore, cardinal issues in academic

writing, where the complexity of arguments demands that things be carefully organized. This guidance is essential in the bridging of gaps that may exist between parts of a text so that one can easily and clearly move from one point to another, making it more readable. As aptly put by one of the students:

> "The suggestions ChatGPT made on the organization of my paragraphs enhanced coherence in my writing. It provided an explicit guide regarding the structuring of ideas and transitions between them, making my essays much more cohesive and logically flowing," stated by participant no.8.

This clear structure not only enables clarity in information but also helps in argumentative purposes within academic contexts. ChatGPT thus is instrumental in providing suggestions for transitions and connections of ideas, thereby enabling the student to sail through the complexities of writing and ensuring that each section flows coherently from the other. It helps students meet rigorous standards of academic writing.

Time Management and Efficiency

Setting Writing Goals: ChatGPT assisted the postgraduate student in setting clear, achievable writing goals and deadlines. Effective time management is one of the most important facets of academic writing. Arguably, this can be very challenging, especially if the tasks are big and complex. ChatGPT therefore breaks this down into manageable steps, thus enabling a student to focus on and stay organized throughout the project. It helps them plan out timelines for each stage of

writing, all the way from research and outlining to drafting and revising. In this way, the structured approach helps the students distribute the time effectively so that they keep up the progress without getting burdened. As one of the students openly confessed:

> "ChatGPT helped me set achievable writing goals, which kept me on track for my writing tasks. Its ability to break down tasks into manageable steps helped me stay organized and motivated. This feature was essential in maintaining a consistent writing routine and ensuring that I made steady progress towards completing my projects," stated by participant no.7.

Specifically, being able to set specific writing goals and deadlines helps not only in workload management but also lowers the tendency toward procrastination. In this way, ChatGPT helped students keep pace and momentum up through the process of writing. This is particularly useful in academic areas, where keeping deadlines is the key to fulfilling academic demands and scholarly aspirations.

Efficient Drafting: Efficient drafting is an important part of the academic writing process, particularly for postgraduate students managing complex projects and deadlines. ChatGPT made important contributions to this with real-time feedback and suggestions that assisted students in quickly and effectively composing the first draft. This feature is reflective of the potential that has been identified in the literature regarding educational technology—that AI tools can introduce efficiency into writing processes by providing immediate support. One participant commented:

"Using ChatGPT made the draft of my essays faster and efficient. Its responses and the ability to generate ideas for content expedited the first part of writing so I could put greater focus on the development and refinement of arguments in the paper. Not only did this save me some time, but it actually improved the overall quality of my drafts by providing a structured framework to build upon," stated by participant no.5.

AI-driven tools increase writing efficiency by helping generate ideas, organize content, and improve it in the draft stage. This aligns with the student's testimony that ChatGPT makes draft writing faster and much smoother. Furthermore, ChatGPT helps students maintain flow and coherence while writing, relating to theories on cognitive processing and writing fluency. By constantly helping and minimizing one's own disruptions, ChatGPT let students keep a better focus on their ideas and transform them into coherent written texts.

Emotional and Psychological Support

Reducing Writing Anxiety: The tool reduced writing anxiety in graduate students. The sources of writing anxiety stretch from extreme academic expectations to fear of failure and doubts about one's writing capabilities. ChatGPT attends to these by providing undeterred and caring support throughout a student's journey in writing, thus releasing pressures that can paralyze students. Most of the time, writing anxiety is related to the fear of making mistakes or receiving negative evaluations, hence hindering the students' writing progress. ChatGPT can be used

as that trustworthy friend in a non-judgmental guide and reassurance, thus playing down these anxieties. This agrees well with the student testimony showing that the availability of ChatGPT as a support resource lessened their anxiety about the writing process:

> "Knowing that ChatGPT was there to help lessened some of my anxiety toward the writing process. It helped in creating a more positive and productive writing experience where I could focus on creativity and clarity without the extra burden of uncertainty or self-doubt," stated by participant no.8.

Moreover, the fact that ChatGPT is a patient and accessible tool makes for a more supportive writing environment. This is particularly important for postgraduate students who may experience very intense academic demands that bring with them time constraints, thus increasing anxiety levels. By lowering writing anxiety, ChatGPT increases general productivity and engagement in writing for students. Anxiety, in most cases, disrupts cognitive processing and creative thinking, which are significant elements when trying to come up with ideas and express them coherently. In this respect, ChatGPT's assistance lets students engage in writing tasks more composed and focused, enabling them to do their work up to standard and meet deadlines.

Building Confidence: The participants' confidence needed to be boosted regarding their writing abilities. Confidence, according to Bandura (1997), is not just a question of being confident and knowing what to do; rather, it also includes

the capacity or will to act, which emanates from the ability to meet the challenges of difficult tasks, and a motive to continue learning. ChatGPT boosts this confidence in several ways by continuously giving constructive feedback on how to write. According to Bandura (1997), self-efficacy—belief in one's ability to succeed in specific situations—is enhanced through mastery experiences, social persuasion, and positive emotional states. ChatGPT feedback acts as a form of mastery experience for students as they monitor their progress and improvement over some time. This is in tandem with the student testimony where it was reported that consistent feedback from ChatGPT increased their confidence:

> "The constant feedback from ChatGPT boosted my confidence in my writing abilities. Constructive suggestions, quick responses, and the general feeling of not being alone in attempts at writing were helpful in finding fault with my work and really polishing it into respectable form," stated by participant no.10.

Moreover, the feedback from ChatGPT is positive and constructive in nature, which merely identifies the weaknesses and upholds the strong points. Such positive reinforcement aids in developing a growth mindset—that these abilities can be cultivated through dedication and hard work—in a student (Dweck, 2006). By valuing and supporting students in the writing process, ChatGPT enables them to become more active and take on additional challenging tasks to write. In working with ChatGPT, while the student builds up trust in his or her writing and compositional abilities, he or she starts to become less reliant on extrinsic

motivation and more independent in his or her academic pursuits—a critical threshold for graduate students to take at a time of study when they are expected to engage critically with complex ideas and produce original scholarly work.

4.1.3. Research Question Three: Limitations of Using ChatGPT

For this question, the participants were asked for their opinions about the possible limitations and weaknesses of ChatGPT as an MKO for scaffolding academic writing. The aim was to get a comprehensive understanding in terms of what challenges and concerns students encounter while using ChatGPT.

Participants provided insights into various challenges connected with its use in academic settings. They raised some core limitations, such as limited subject matter expertise, possible inaccuracies in the information provided, the incapacity to offer empathetic support and personalized feedback to struggle in providing nuanced guidance. The study now proceeds to elaborate on each of these limitations to make a case for human intervention to fill the gap left by the help provided by ChatGPT.

Limited Subject Matter Expertise

Depth of Knowledge: The major limitation for an MKO that relies on ChatGPT is that it can sometimes be informationally thin, especially on such specialized or very advanced academic subjects. Although well-suited to provide general information and assist on a wide range of issues, as Vygotsky (1978), ChatGPT may not have highly specialized expertise in specific areas. For postgraduate students working on rigorous academic research and writing, the level

of detail expected is usually much above what ChatGPT can do. In some cases, this may manifest when the answers from ChatGPT feel so general or not detailed enough to tackle issues that are uniquely only found in specialized topics. According to a student:

> "Very seldom was the feedback from ChatGPT too vague and did not cover all the intricacies on the topic. Though valuable insights and pieces of advice were provided, there were situations that required more in-depth analysis with specific feedback to the topic. That made me want to look for further sources and expert opinion to be sure of comprehensive realization and profound explication of complex ideas in the text," stated by participant no.6.

This, therefore, forms the basis of the feedback, as students may struggle to get the exact and complete understanding that is deemed necessary according to the strict criteria of any postgraduate writing. While ChatGPT might be of use in arranging the thoughts in the correct order, giving primitive explanations, and even offering general directions, it lacks the nuance of understanding that furnishes domain-specific knowledge, an expectation for advanced academic writing and thinkink. Vygotsky's (1978) sociocultural theory focuses on the role of the MKO in giving the learner more than what one would be able to do individually. For efficient scaffolding, the MKO has to have enough expertise so that he or she could advise learners through progressively more complicated tasks, according to Vygotsky in 1978. In cases where this knowledge is limited in ChatGPT, it becomes

less effective as an MKO and may not let the students delve deep into specialized topics or refine research in a nuanced manner.

Accuracy of Information: Another critical limitation of using ChatGPT as an MKO is its potential lack of accuracy of information. Although ChatGPT can help with a variety of subjects, the potential to have precise and reliable information on specialized or advanced academic topics is greatly hampered. A large concern stems from documented cases where ChatGPT reportedly gave incorrect or outdated information, as one student pointed out:

> "I found that some of the information ChatGPT gave was somewhat inaccurate. Though generally helpful in giving guidelines, there were bits of information that had a speck of accuracy but were generally wrong. This gave me a reason to fact-check and view everything from ChatGPT with a lot of critical judgment so as to be reliable and credible with the information in writing," stated by participant no.6.

This can be detrimental to the research and writing processes of students, hence probable inaccuracies in student work and a diminished credibility of their academic efforts. Such inaccuracies are dangerous in an academic setting where reliability and validity of information is everything. Information accuracy is thus important in maintaining the integrity of the research and in ensuring that students produce quality work that passes the scrutiny of a scholarly environment. While it may give general guidance and help one to begin organizing thoughts and content structure, the limitations regarding the depth of knowledge and accuracy decisively

establish the need for checking AI-generated content against credible sources. According to Vygotsky's (1978) Sociocultural theory, the role of the MKO is to guide the learners through tasks beyond their current capability, thus facilitating cognitive development. However, for it to effectively serve as an MKO, the information that ChatGPT provides must be correct and reliable. If there are mistakes, it is possible for a student to fight for the rigor of academic achievement, further investigating the results that this chatbot produced with independent verification so that the answers can be correct and accurate.

Lack of Human Touch

Emotional Intelligence: This is a major limitation associated with relying on ChatGPT as an MKO: it lacks the emotional intelligence to dispense this empathetic and motivational support to students. Unlike the human supervisor, ChatGPT has no way of offering emotional understanding, encouragement, and individualized support that might influence motivation and well-being during the academic journey. Human supervisors can offer empathy and emotional support in a way that carries students through stressful or difficult moments. More than anything else, in fact, this human element is especially crucial for students who have anxiety or those who might not be confident in their writing—among a host of other emotional issues that could further complicate the academic journey. One student made the following comment:

> "I was missing the element of personal encouragement and understanding which my human supervisor provided. There was no empathy, encouragement that human supervisors provide. Their ability to understand my individual challenges and motivations added a crucial human element to

the feedback process, tending a more supportive and motivating atmosphere for my writing efforts," stated by participant no.5.

The quote epitomizes what is understood to be important in terms of emotional support from the human perspective, which cannot be completely reproduced at this time by ChatGPT. It would feel terribly lonely and unsupportive to the student if the AI, like ChatGPT, could not offer any sort of empathetic and motivational support. Especially in times when they need special encouragement, emotional intelligence in an academic environment greatly enhances the experience of students about a supportive learning environment. Individual encouragement, which motivates a student to face challenges and finally achieve the set academic goals, can be made possible by human supervisors in their feedback and support. In contrast, algorithm-driven interactions, as in ChatGPT, lack the emotional depth to deal with complex emotional states and challenges that students might go through.

In Vygotsky's (1978) theory, social interaction and guidance from knowledgeable others act as a vehicle for cognitive development. Thus, in a sense, ChatGPT becomes a very useful MKO by its provision of cognitive support and guidance on academic tasks. However, it is against the background of the limitations in ChatGPT in terms of emotional intelligence that one underlines the role human supervisors continue to undertake in providing critical emotional and motivational support to students.

Contextual Understanding: Another major limitation of ChatGPT as an MKO is that it fails to understand the context in which something is being worked on by a student. While ChatGPT is great at providing general advice and feedback

on all topics, it really falls short on things that make each student's writing or research project unique. This limitation can result in feedback that is generic and, therefore, not wholly applicable to the student's particular situation or academic task at an advance level. Indeed, as indicated by one of the students, the feedback was unsatisfactory because:

> "At times, feedback from ChatGPT seemed irrelevant and a little off-topic; it did not pertain exactly to what is being done," stated by participant no.1.

The statement thus elaborates on how, though well-intentioned, ChatGPT goes off the mark in answering the intricacies involved in a student's work. AI's lack of understanding of what exactly an assignment requires, subtle aspects of the topic, or whom it aims to address causes irrelevant and less deep feedback. This could, in turn, cause students to get a great deal of advice that is not very relevant for their needs. In that sense, ChatGPT could turn out to be rather ineffective for the scaffolding roles presented above. While ChatGPT serves as an MKO expected to provide cognitive support and guidance, its wrestle with contextual understanding underlines the continuous role of human supervisors in giving personalized feedback that considers the particular context in which a student does their academic work.

It is pertinent to mention here that context is everything in student writing, as it provides relevant and efficient guidance toward fostering learning and improvement within an academic environment. Unlike machines, the supervisors of human beings respond intelligently to such unique characteristics of the work of the student and provide relevant feedback on the challenges of the one and give

support to individual growth. On the other hand, the sole reliance of ChatGPT on algorithms and predefined patterns cuts its capacity to adapt to the rich diversity of needs coming from students working within multifarious disciplines at each particular academic level.

Over-Simplification of Feedback

Generic Feedback: One of the striking limitations in this regard for ChatGPT to act as an MKO is that it sometimes oversimplifies or generalizes its feedback. While it is pretty effective at catching many mistakes and making basic suggestions for writing improvement, ChatGPT usually disappoints in higher-order concerns belonging to the complexities of academic writing. Such generic feedback might not be very useful for postgraduate students who really need specific and direct feedback from an instructor, tailored to their individual assignments and academic disciplines. One of the students expressed this frustration over the feedback that ChatGPT offered:

"The feedback that I received from ChatGPT was, at times, general and unhelpful in the finer details of my writing. It lacked specific insights that might have enhanced clarity and precision in writing. This led me to seek more detailed feedback in order to make sure that I was able to handle minutiae and finer nuances of writing effectively.," stated by participant no.8.

This feedback illustrates how ChatGPT's responses are informative but sometimes lack the depth needed to really help refine and polish advanced academic writing tasks. To that end, the limitations of AI in providing nuanced feedback in

this regard are particularly challenging for postgraduate students expected to display advanced levels of proficiency and sophistication in their academic writing. ChatGPT becomes a vital representative of an MKO who kick-starts the student with basic guidance and feedback. However, its propensity for general responses underscores that human supervisors still continue to play a role in giving personalized and detailed feedback dealing with the specific nuances of academic writing.

Detailed feedback in academic contexts guides students toward improvement by attending to specific strengths and weaknesses of student work. Human supervisors possess the professionalism to interpret and respond to the intricacies of individual assignments, hence able to provide customized guidance that supports deeper understanding and more skill development. In this respect, ChatGPT, because it is based on pre-set algorithms and generalized patterns, has limited functionality to deliver such depth and specificity needed in advanced writing tasks.

Lack of Critical Analysis: Another limitations of ChatGPT as a tool for postgraduate students lies in its inability to provide critical analysis required for advanced writing. While ChatGPT is able to pick up many of the surface-level issues, it provides very simplistic suggestions and generally lacks any deep critique and critical insight into the deep arguments, structure, and theoretical framework of academic papers. This is observed from the comment of a student:

"The suggestions failed to give the critical insight that my work needed. At times, I found myself needing deeper analysis and more nuanced feedback to elevate my writing to the desired level," stated by participant no.6.

This comment shows how the responses from ChatGPT can, at best, fall short of making a deep analysis that sharpens arguments, improves theoretical insight, and raises the general quality of academic writing. If this critical analysis does not occur, then students lose the chances for academic growth and the building of subtle writing skills. From the standpoint of Vygotsky's (1978) Sociocultural theory, ChatGPT represents an MKO that provides base scaffolding with foundational support and initial feedback. Its inability to provide critical analysis makes human supervisors relevant in providing nuanced and detailed feedback tailored toward the specific requirements of advanced writing.

Proper criticism in academic contexts steers one toward improvement by showing strengths and weaknesses of student work. These complex nuances can only be critically interpreted by human supervisors and offer insightful feedback that can foster deeper understanding and the development of skills. By contrast, ChatGPT uses predefined algorithms and generalized patterns, but this falls a little short to deliver the level of critical analysis that is required for high-level academic success.

Technological Dependence

Technical Issues: Technical difficulties, ranging from software problems to issues with internet connectivity, are some of the major problems that are associated

with depending on ChatGPT for support in writing academically. Technical difficulties can cause an interruption to the writing process, consequently leading to delays and frustration among students who may rely on ChatGPT for immediate feedback and guidance. One student explained this concern:

> "There have been moments when I was not able to access ChatGPT because of certain failures, and these have disrupted my writing significantly while at the same time denying me the chance for immediate help and guidance," stated by participant no.7.

This response epitomizes how technical failures have an adverse effect on a student, more so during the most critical moments of the work, such as approaching deadlines. Continuity in a dependable writing assistant helps maintain workflow and meets academic deliverables within the required time. When technical failures strike on ChatGPT, reliability as an independent tool in acquiring help with academic writing is lost. From the perspective of Vygotsky's (1978) Sociocultural of scaffolding, ChatGPT functions like an MKO for some foundational scaffolding and. However, it is only effective if it is fully available and functional. Technical faults undermine its ability to do so efficiently and effectively, slowing down student progress and productivity.

Specifically, in a context where technical reliability is crucial—in the academic context—such instant and reliable feedback is relevant to the student's success. In this respect, human supervisors have a very important complementary role to ChatGPT assistance through their ability to adapt and troubleshoot

effectively. In case of technical disruptions, they may provide continuity and individual support so that students keep getting the help to advance their skills in academic writing.

Over-Reliance on Technology: In addition, the major fears that come by with students depending on ChatGPT as support in writing are the building over-relience on AI at the cost of critical thinking and self-dependent writing. Though ChatGPT offers tons of benefits in terms of generating ideas and getting feedback, the students learn to be overly dependent on the capability, as a student expressed:

> "I was starting to overuse ChatGPT and not really develop my own writing skills, which I should have been doing. This dependency did not contribute at all towards my personal growth as a writer; it made me refocus on sharpening my own abilities and fostering creativity without always using AI help," stated by participant no.4.

This comment brings into focus the risks of technological dependency, in which, driven by convenience-seeking, students fall into the trap of choosing technologies over actively engaging themselves in deep learning and skill refinement. To put it bluntly, with the use of ChatGPT and other AI tools in carrying out tasks, the chances for independent practice of analytical and problem-solving skills crucial for academic and professional success diminish, as students start becoming overly dependent on, and less self-confident in their abilities to resolve, challenging issues. From the perspective of Vygotsky's (1978) sociocultural theory, ChatGPT acts as an MKO who guides students in their writing, but its support

should be given in ways in which, over time, students are encouraged to engage in increasingly independent tasks and develop their cognitive capacities. Over-reliance on ChatGPT may lead to the student missing out on vital learning experiences that create intellectual growth and skill mastery in academic writing.

Although AI tools could potentially enhance accessibility and efficiency in tasks that involve writing, they should be used as a complement, not a replacement, to traditional techniques of learning. Human supervisors play an important role in giving students individual feedback and guiding them to a deeper level of understanding and skills. They help them navigate the intricacies involved in academic writing, challenge one's thinking, and urge students to go back and firm up ideas on their own.

Privacy and Security Concerns

Data Privacy: Another concern associated with the use of ChatGPT within an academic setting is data privacy and security. Students at postgraduate levels often deal with sensitive and confidential information, which may include personal data to proprietary research findings. There are some apprehensions regarding how such data is stored, managed, and even utilized by the AI service providers. A student voiced his concern over data confidentiality in using ChatGPT:

> "I was concerned about the confidentiality of my work and the data I share with ChatGPT. I had to be mindful of sensitive information and ideas that I wanted to keep safe and secure from any unintended access or manipulation," stated by participant no.6.

This epitomizes, most appropriately, wider user anxieties about intellectual property and personal information. These concerns are obviously of greater relevance within the academic circles where the integrity of research and the confidentiality of data are the very essence of the exercise. Data privacy in AI-mediated interactions is important from a sociocultural perspective, which underlines the socio-technical contexts of learning and collaboration. In case ChatGPT is to act as an MKO able to help students in their academia, preservation of trust in the confidentiality and integrity of data is very important in establishing productive learning environments.

Furthermore, it becomes mandatory to adhere to data protection regulations such as the General Data Protection Regulation (GDPR) in Europe and California Consumer Privacy Act (CCPA) in the United States. These are regulations that stipulate strict requirements on collecting, storing, and processing personal data, provisions for informed consent, and data breach notification. AI service providers must thus take very strict measures in protecting privacy and security of data through encryption, anonymization, and access control. Also, very important is the establishment of transparent policies regarding practices over data handling and clear communication with users on how the information provided is being used to build trust in, as well as confidence of, AI technologies.

Intellectual Property: Another issue in using ChatGPT in an academic setting has to do with intellectual property rights: who owns the content that AI helps come up with? The more students turn to the potential of AI tools like

ChatGPT in writing and for research, the more questions there are regarding who owns the rights to the content produced. One student verbalized the concern:

> "I was not really sure who owned the content generated with the help of ChatGPT and how it might be used. This made me very careful about the implications of using AI-generated content and the potential rights associated with it," stated by participant no.8.

This uncertainty points to an even broader hesitation of users in regard to the implications of using AI-generated content in their academic work. There are concerns about possible consequences related to ownership, usage, and proper attribution for the content created with the AI's help. Dealing with issues of intellectual property becomes important from the socio-cultural perspective that looks at the collaborative and socio-technical features of learning. Interactions between students, AI tools, and service providers are so dynamic; therefore, it calls for clear guidelines with transparency to the ownership rights and usage policies. In connection with these concerns, AI service providers should be directed towards the need to clarify and clearly communicate the intellectual property rights associated with content generated over their platforms. This includes specifying whether students retain full ownership of the content they create, and how AI service providers may use or access this content.

Contemplation of the implications of intellectual property rights is indispensable for any student moving through the labyrinth of academic integrity guidelines to publication norms. This also calls for institutional and AI service

provider collaboration in setting up frameworks that balance the protection of student rights with the promotion of ethical uses of AI technologies within educational contexts. This consideration must further fix robust data security measures to protect AI-generated content from unauthorized access or other misuses. This goes in line with protecting the intellectual property rights of students, creating trust in AI-driven educational tools by adhering to the data protection regulations and best practices in handling the data.

4.2. Research Discussions

In this section, the researcher explores and analyzes the views and opinions expressed by postgraduate students regarding the adoption and use of ChatGPT as an MKO that scaffolds academic writing at higher education levels. The discussions in the present study are guided by three research questions that seek to answer how much impact and effectiveness ChatGPT, as an MKO, has. The researcher brings insights into the experiences, benefits, and challenges of using ChatGPT as an MKO in higher education by carefully examining and in-depth consideration of the views from the students.

4.2.1. ChatGPT's Benefits and Students' Experiences with It as an MKO

In particular, these findings suggest that the overall perception of postgraduate students was that ChatGPT was a more knowledgeable other in scaffolding their academic writing. This perception is supported by the theoretical framework which provides that, according to Vygotsky's (1978) sociocultural theory, MKOs facilitate learning within the ZPD. According to Vygotsky (1978),

MKOs offer the required assistance so that learners can accomplish a task that they cannot be able to do on their own. In this context, ChatGPT was also an example of an MKO through the provision of immediate feedback and other forms of guidance and suggestions which helped students improve their writing skills incrementally. Several factors contributed to the positive uptake of ChatGPT. The biggest factor to this uptake is that the AI was highly accessible and available for the students compared with traditional human MKO availability such as the instructor or peer. This finding is supported by Luckin et al. (2006) in their study, which highlights the importance of availability and accessibility of digital tools in education. Students appreciated that they could get immediate feedback anytime to support continuous learning and improvement.

Also, there was appreciation of the consistency of feedback that students obtained from ChatGPT. Unlike human MKOs whose feedback may be different due to subjective inferences or availability, ChatGPT feedback is standardized, and thus guideline standards are kept across various writing tasks. Such consistency is important in sustaining a clear and structured approach in learning processes, an aspect Rosenshine and Meister (1992) have mentioned about effective instructional strategies. One of the most significant areas in which ChatGPT contributed to students' writing skills lay in the improvement of grammar and syntax. As the AI recognized grammatical errors and corrected them with reasons and explanations, it taught students the underlying rules of grammar. This improvement was especially beneficial for non-native English speakers who generally find it difficult to deal with the complexities of English grammar. It is in this sense that detailed feedback from ChatGPT made it possible for the students to learn from the mistakes

and further apply these lessons in future writing tasks. This is further supported by Ekstrand et al. (2023), who proposed that AI tools can act as an MKO by providing personalized and detailed feedback, enhancing learning.

Beyond simply correcting the mistakes, ChatGPT provided students with suggestions for syntax improvement. Syntax is one of the most essential features of writing. It relates to how words and phrases are structured to form well-formed sentences that give clarity and coherence to writing. Many times, AI feedback gave alternative sentence constructions and hence practically demonstrated to the students how to improve their sentence structure. This is supported by Roll and Wylie (2016), who noted that AI has the potential to help one in complex tasks such as syntactic improvements. It has also had a far-reaching impact on the writing style of students, which includes the tone, clarity, and coherence. The AI gave tips on how to maintain a consistent tone through the work, avoiding redundancy in enhancing readability. It made students' writing more refined, as reported by them. For example, one student commented that through the guidance of tone that ChatGPT provided, the student was able to maintain formal academic style of writing, which is hard to achieve for postgraduate students moving from other forms of writing.

The enhancement of the stylistic elements by ChatGPT is supported by research from Kumar (2023), which finds that AI has the potential to engage students in a constructive dialogue concerning their writing to refine arguments and guarantee coherence. Students could get immediate feedback on the stylistic aspects and make instant changes, therefore beginning with positive writing habits. As Ferris and Hedgcock (2023), assert, this iterative interaction is critical in developing

a polished professional writing style. One other critical area in which ChatGPT was helpful to these students pertains to the organization and structuring of essays. The AI helped students to create clean outlines of what they wanted to argue, to logically arrange their arguments, and have structures that held the papers together. This was particularly useful support for students who found the organization of complex ideas and arguments problematic, which has been a common challenge in academic writing.

The findings show that ChatGPT's structuring and organizing capabilities are in line with the concept of scaffolding described by Wood et al. (1976) In this way, it acted like a scaffold by giving students templates, outlines, and organizational tips to tackle these complex writing tasks. Most importantly, this structured writing is the key to producing clear, cogent academic papers, argued by Graham and Perin (2007) in their overview of writing instruction. Also, it was very easy to use and available, hence ChatGPT performed well. The AI was always available and gave feedback at any time of the day, so students could work outside of class hours or across time zones. This meant that students could get instant help whenever they needed it, without having to wait like in other traditional methods of feedback.

This 24/7 accessibility also aligns with the work of Luckin et al. (2006), who have placed critical emphasis on the availability of educational tools as a way to ensure consistency in support and thereby provide improvement in learning outcomes. Feedback available at any time helps students work at their own pace and derive help in due time, which becomes particularly important in today's globalized education environment with various student needs. The friendly user

interface of ChatGPT made it easier for students to have their inputs across to the AI and for the feedback from the system to be clear. It is essentially a tool in which students would only have to type their text and, after minimal delay, generate elaborate feedback. This was critical to ensure equity across digital literacy levels so that all students could use the tool effectively.

Graham and Perin (2007) note that unless the tools are easy to use, success in educational tools is not realized since they cannot be effectively applied. In this respect, their study indicated that if students find the tools to be easy to use, they would constantly work with them effectively, hence leading to better learning outcomes. Moreover, the scalability of ChatGPT provided it with the capacity to handle vast numbers of requests at a time, which is a solid foundation for any educational institution willing to provide coverage on the teaching of writing skills to many students. This scalability is very important in maintaining consistent quality feedback across different users and ensuring detailed guidance to all students. ChatGPT's scalability corresponds to the idea put forward by Garg et al. (2023), who focus on the essence of reliable and scalable education technologies in sustaining large student populations. Their findings indicate that scalable AI tools provide homogeneous and high-quality support to a wide diversity of students, thus increasing the general equity and effectiveness of education.

Overall, the study highlights features of ChatGPT that are useful in regard to grammatical correction, sentence restructuring, and style enhancement. The tool has been instrumental in improving students' writing skills in higher education setting because the use of ChatGPT ensured continuous support through ease of use

and accessibility. These benefits are supported by the existing literature above showing how AI tools can transform educational practices and outcome.

4.2.2. Challenges and Limitations of Using ChatGPT as an MKO

While ChatGPT proved very instrumental in improving writing skills among students, it was not without its technical challenges. Of the very prominent challenges the students faced were those concerning the breadth and depth of responses by ChatGPT. While the AI can provide feedback, sometimes its suggestions might miss all the subtleties of academic writing or even lead to misunderstandings. For instance, ChatGPT sometimes gave corrections that were overly simplistic or inappropriate in certain contexts because they did not consider the subtlety of a particular academic discipline or the complexities of some arguments. This limitation concurs with the findings of Hs Kumar (2023), in which it was observed that while ChatGPT can be systematic and original, sometimes the quality and depth for advanced academic writing may not be available.

Another technical challenge pertains to the accurate interpretation and response of the AI to complex prompts. The students reported cases where the questions were either partially understood by ChatGPT or the responses partly addressed their needs. This can be attributed to the core limitation of natural language processing. AI models such as ChatGPT sometimes may not interpret or understand imprecise or poorly worded text inputs. Joshi et al. (2023) shared similar concerns, thus showing how unreliable ChatGPT is in answering a diversity of complex questions related to computer science and raising doubts about its application in other rigorous academic contexts.

Moreover, server downtime, response delays, and occasional software glitches contributed to problems in the use of ChatGPT seamlessly. Such interruptions might hinder the learning process, especially in situations when students need immediate feedback for constant improvement. The necessity of having a stable Internet connection also posed a challenge to some students, especially to those who have this limitation within their areas. Garg et al. (2023) added their voice to the debate by talking about the reliability of educational tools; this, according to them, is one of the major ways through which users' trust could be upheld and uniformity in learning outcomes realized.

While this tool offers a significant addition in value to the benefits, there is also a considerable risk that students may lean too heavily on the AI, to the detriment of the development of their independent writing skills. The ease and speed at which ChatGPT gives feedback may create dependence, and that would undermine critical thinking and problem-solving, two important components of academic writing. If students turn to ChatGPT for everything, then they can simply never develop a critically analytical mindset and deepen their understanding of writing mechanics through personal effort and reflection.

This possibility of dependency is further increased by the potential capability of the AI to provide complete answers and revisions that might set students into a habit of using it as a crutch rather than as a learning tool. Students who become too reliant have less creativity and find less of a personal writing style if they simply follow what the AI has suggested, rather than exploring and experimenting with their own ideas. As Salomon (1991) puts it, the use of educational technology should complement, not replace, the cognitive processes of

learning. Over-reliant application of AI writing tools, like ChatGPT, could foster a more passive way of learning and reduce students' critical involvement with writing tasks to a high degree.

Furthermore, this high usage rate for ChatGPT may lead to superficial knowledge about the principles of writing. Even though the AI can correct and provide feedback, it cannot offer explanations and personal tutoring like humans can. Students, in this sense, cannot genuinely understand the principles behind the feedback they obtain. Tharp and Gallimore (1991) explained that the important thing about good scaffolding is not only providing the answers but also representing an understanding of the process, which might elude AI tools such as ChatGPT.

Therefore, educators and institutions need to address these risks through the promotion of balanced use of AI tools. While of course ChatGPT is a very useful tool, it has to be placed within a broader educational framework for students' independent learning, focusing on critical thinking. Learners should be guided as to how to use ChatGPT as an auxiliary tool rather than as a primary source of feedback. Therefore, educators could offer training concerning the limitations of AI and how to engage critically with feedback. This approach is in line with principles by Puntambekar and Hubscher (2005), who emphasize a balanced integration of technology in education in support rather than replacing human cognitive processes.

Overall, ChatGPT provides useful support for enhancing grammatical accuracy and sentence construction and improving overall writing quality, it is not without problems and challenges. Technical issues and exposure to over-reliance pose great risks that should be dealt with in terms of caution. By blending a balanced approach, merging the benefits of AI with the value brought by human instruction

and independent practice, the educational institution can maximize the gains made by ChatGPT while keeping its demerits at bay.

4.2.3. Comparisons with Traditional MKOs

ChatGPT and traditional human MKOs, such as the teacher and classmates, have their strengths and weaknesses as academic writing mentors. Comparing their effectiveness, due to the insights on human-integrated feedback provided by the participants, shows how these tools complement each other to allow students to experience better learning.

Traditional MKOs, like instructors and peers, are best placed to provide individuated feedback attuned to students' particular needs and context. The instructors bring deep subject knowledge and pedagogical acumen, allowing them to make most contextualized and relevant insights toward the attainment of the learning goals set out by the student. Peers give relatable feedback and support, often sharing similar struggles and perspectives that can be encouraging and motivating. This is proven by Vygotsky's (1978) concept in Sociocultural theory that the interaction with human MKOs facilitates deeper cognitive engagement through social learning processes in which learners internalize new knowledge through guided interaction.

Even though ChatGPT cannot offer the same kind of personalized understanding, it has some very strong advantages compared to human MKOs. First, its accessibility and availability are absolutely unparalleled. It can provide instant feedback at any given time, and this is quite important when students need instant help outside of class time. This availability also fixes a very common

limitation of the traditional MKOs, who are not available all the time because of time constraints and conflicts. Luckin et al. (2006) focus on the accessibility of educational tools, underlining the fact that it is continuous availability that may really help the learning process, offering support at the right time.

Besides, ChatGPT is good at offering standardized feedback so that all students are treated equally with regard to detailed guidance. This may assist in maintaining a quality in the feedback given among different users, hence cutting down on variations that sometimes come with human MKOs. The downside of this could be that this very consistency might, at times, prove to be a limitation for it to fully adapt its feedback to the particular context of student's work; it can at times miss certain subtleties that a human instructors would notice.

ChatGPT provides strong augmentation to such traditional forms of academic support by filling in the voids that human MKOs may have. For instance, serving as an initial review tool that assists students in fine-tuning their grammar, syntax, and structure before they go for more sophisticated feedback from the instructor or peers. This preliminary feedback can help make a student's time with human MKOs more productive in interactions; during their limited time with instructors, they focus on higher-order concerns like argument development and critical analysis.

Moreover, ChatGPT is able to help students with self-practice in writing to reinforce acquired skills, thus encouraging a more independent approach to learning. This also fits into the blended learning educational philosophy, in which technology is used to enhance conventional pedagogical practices. As Graham and Perin (2007) state, the integration of technological tools within traditional

instruction, such as under the supervision of human supervisors, increases effectiveness of educational processes by providing multiple avenues to learn and practice.

One of the standout features of ChatGPT is the instant feedback it offers. It does not break the writing momentum with instantaneous revision and improvement. Kumar (2023) argued for instant feedback as pedagogy that helps more in setting the students up with lessons. Moreover, ChatGPT is able to process a number of requests all at once, making it a scalable solution for educational institutions that intend to provide writing support at large scales.

The notable disadvantages of ChatGPT, however, balance out these benefits. Most of the time, its responses are accurate but relatively lacking in depth and contextual sensitivity compared to human feedback. For example, it may suggest improvements which are very general yet do not meet all requirements for a complex academic paper. Hs Kumar (2023) also mentions that although ChatGPT is capable of producing systematic content, it often lacks the quality and depth required for advanced writing. The inability of AI to understand the context as a whole or the subtleties of the subject matter can result in feedback that is not wholly relevant or appropriate.

Another major disadvantage is that, as mentioned above, students can become too reliant on ChatGPT. This can even pose a barrier to acquiring independent writing and critical thinking skills which human MKOs provide better and which are some of the most important factors in successful academic performance. Salomon (1991) argues this by saying that even if the technology

developed for education can support learning, there is no reason it should replace the cognitive effort of learning nor retain knowledge acquired independently.

Overall, though providing a number of benefits in terms of accessibility, consistency, and immediacy, ChatGPT could be seen more as a complement rather than a replacement for more traditional human MKOs. Indeed, some suggest that AI and human feedback can work together to afford students a more holistic approach to academic writing. By embedding ChatGPT in a more comprehensive educational framework that includes tailored human contact, it is possible for the educational system to reap the full benefits of both technologies and allow students to receive a comprehensive and effective writing facility.

CHAPTER V

CONCLUSIONS AND SUGGESTIONS

The chapter summarizes the findings of the study and makes suggestions based on such results in the form of recommendations that could be plausible for future research or practical applications. The chapter first gives a summary of the main insights gained into the role that ChatGPT would play as an MKO in scaffolding academic writing among postgraduate students. The chapter then sheds light on how it improves grammar, syntax, and stylistic elements, along with problems and limitations related to the application of ChatGPT. It goes on to look at the broader implications of the integration of AI tools such as ChatGPT within higher education, highlighting how these tools can augment writing support in a way that actually complements traditional methods. This thereby sets the scene for the recommendations section, which proposes some avenues of future research and some practical steps that could be taken by educational institutions and AI developers in an effort to optimize the use of AI as an academic writing aid. The chapter finishes with an attempt at providing an integrated set of insights and recommendations underpinning the transformative potential of AI in education.

5.1. Conclusion

In this study, the researcher explored postgraduate students' experience, gains, and drawbacks from using ChatGPT 3.5 as an MKO in scaffolding academic writing. Exploration included the aspects of its impact that pertain to grammar and syntax, stylistic enhancement, and the structuring of the paper. The researcher also covered the problems and limitations that turn up with ChatGPT use, such as

technical issues and the potential for creating an overreliance on technology, and compared its effectiveness to traditional human MKOs. Further, the researcher reflected on the broader implications of implementing AI tools like ChatGPT into higher education and provides suggestions for future research that includes practical applications. It is revealed that ChatGPT has improved students' grammatical accuracy and sentence construction through immediate feedback. It helped non-native English speakers and those who made grammatical mistakes to realize these rules and apply them. The AI suggestions to restructure a sentence improved the syntax of students' writing and made it clearer and more coherent. ChatGPT improved the stylistic elements, such as tone, clarity, and coherence, to make sure that students' writings were in line with the formal criteria of academic writing. It also helped students to maintain better organization and structure of the essays by creating clear outlines and logical flow.

Notwithstanding its benefits, ChatGPT had some technical challenges, including occasional inaccuracies, limited depth, and the potential of creating an overly dependent student. Comparing ChatGPT to traditional human MKOs, the researcher perceived that while the AI gave consistent and accessible feedback, the context and individualism able to be provided by a human instructor lacked in the AI. ChatGPT can complement conventional means by providing preliminary feedback, enhancing the learning experience as a whole. These findings further resonate with the potential of ChatGPT in improving postgraduate students' academic writing capabilities. Based on how it offers instant feedback, ChatGPT makes up the deficiency between classroom instruction and individual study, hence making academic support more accessible. Improvements in grammar, syntax,

style, and organization that students experienced testify to its potential to function as an effective MKO, providing scaffolded support for better writing outcomes at a basic level. These findings assume particular significance for higher education, where the demand for high-quality writing support is on the increase, yet resources are at times thin.

Moreover, the high potential of ChatGPT to act as an MKO poses a scalable and accessible solution to academic writing support in higher education at a basic level. Its ability for consistent, immediate feedback enhances student iterative improvement of writing skills, encouraging more reflexive self-directed approaches to learning. While it cannot substitute the human instructor's shade and individual, nuanced advice, it proves to be a useful complement that can really enhance the educational experience as a whole. Not only do AI tools such as ChatGPT have the potential to democratize quality writing support at the level of higher education, but they also reduce existing disparities in resource access and ensure that all students can succeed on an even playing field. It is only through the creation of a more inclusive, efficient, and impactful learning environment—drawing on the strengths of AI and human instruction—that educational institutions can truly benefit. This can be achieved by continuous research and evaluation toward refining these tools so as to maximize benefits and continue meeting students' and educators' needs.

5.2. Recommendations

One of the major recommendations for further research on ChatGPT is the potential long-term effects of its usage on the writing skills of students. A clear visualization of how such continued usage could affect the development of writing

proficiency over time can be derived from longitudinal studies. This type of study would determine whether students continue improving their writing skills on their own from the use of ChatGPT or if they start depending on the tool, thereby hampering their progress. Another critical research domain is the efficiency of ChatGPT across various academic disciplines. This research dealt with academic writing, and hence future research can study how ChatGPT performs in domains like STEM, humanities, and social sciences. In such a way, some kind of disciplinary approach can reveal if there are any red flags or bonuses for using AI within these different contexts. Moreover, one has to consider the equity issues within AI tools like ChatGPT. In this regard, research should investigate the kind of access that different student populations have to, and how they benefit from, the AI-powered writing tools. These studies could enable an appreciation of the dynamics involved in ensuring that the infusion of AI into education remains inclusive and at the same time reduces disparities.

Furthermore, this study may diversify and increase practical applications of ChatGPT in the classroom through the insights documented. One recommendation is for the inclusion of ChatGPT into writing centers and tutoring programs. Since the AI tools is able to make preliminary remarks on grammar, syntax, and structure, thus supporting the human tutors in focusing on higher-order writing skills like argumentation and critical analysis. Such integration might render writing support more efficient and accessible. Another practical application would be working ChatGPT into coursework and assignments as complementary work. Instructors may develop activities in which students use ChatGPT to draft or revise their essays, after which they perform peer reviews and instructor feedback. This blended

approach can strengthen students' writing with multiple layers of feedback, joining the strengths of AI with human insights. ChatGPT can also be used for formative assessments, providing students with instant feedback on the progress of their writing. In this way, students can identify and correct their weaknesses before submitting any final drafts. This generally makes for a more iterative and reflective writing process.

Last but not least, there arises the need for constant evaluation and improvement of AI tools like ChatGPT in education. The continuous evaluation of these tools should be carried out to continuously meet the requirements of both the students and the educators. Constant feedback from users can help in updating and fine-tuning to make the AI more efficient and user-friendly. One must also develop standard evaluation frameworks that would support the measurement of performance and impact of the AI tools within educational contexts. Such dimensions in which frameworks should be built need to include accuracy, usability, accessibility, and educational outcomes. Comprehensive evaluation criteria thus let the different stakeholders understand the strengths and limitations of AI tools and make a decision on their integration. More importantly, there should be a collaborative effort for the continuous improvement of AI tools among teachers, AI developers, and researchers. Educators can offer real-life insights into the needs of the classroom. Researchers could offer theoretical and empirical evidence that should inform development. AI developers can take this feedback back to develop and fine-tune algorithms and features so that this use case fits its intended educational purposes. The other improvement area is on ethical questions of AI in education. It should, therefore, explore aspects to do with data privacy,

algorithm bias, and the ethics surrounding feedback generated by A.I. The development of ethical guidance and best practice can mitigate these risks and inform the responsible and equitable use of A.I. tools like ChatGPT.

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APPENDIX 1 – CONSENT FORM FOR PARTICIPATION IN THE STUDY

Introduction

You are invited to participate in this research study conducted by Maroof Ahmed, a postgraduate student at the Indonesian International Islamic University. The purpose of this study is to explore postgraduate students' experiences, benefits and disadvantages of using ChatGPT 3.5 as a More Knowledgeable Other (MKO) for scaffolding academic writing. Your participation in this study will provide valuable insights that will contribute to the understanding of how AI tools can be integrated into academic writing support.

Procedures

If you agree to participate in this study, you will be asked to:

1. Complete a preliminary questionnaire designed to gather basic information about your academic writing experience and familiarity with ChatGPT.
2. Participate in a series of detailed questionnaires and semi-structured interviews focusing on your experiences with ChatGPT in academic writing.

Voluntary Participation

Your participation in this study is entirely voluntary. You have the right to withdraw at any time without any consequences. Refusal to participate will not affect your academic standing or relationship with the researcher and/or university.

Confidentiality

All information collected in this study will be kept strictly confidential. Your responses will be anonymized, and any identifying information will be removed. The data will be securely stored and only accessible to the researcher.

Risks and Benefits

There are minimal risks associated with participating in this study. You may feel some discomfort when discussing your academic writing challenges. However, your participation will contribute to a better understanding of the use of ChatGPT in academic writing, which can benefit future students and educators.

Informed Consent

By signing this form, you agree that you have read and understood the information provided above, and you voluntarily agree to participate in this study.

Participant's Name: _____

Signature: _____

Date: _____

Researcher's Name:

Researcher's Signature: _____

Date: _____

Contact Information

If you have any questions or concerns about this study, please contact Maroof Ahmed at maroof.ahmed@uiii.ac.id.

APPENDIX 2 - CLOSE-ENDED SCREENING INTERVIEW QUESTIONS

1. In your academic writing, have you ever used ChatGPT (Yes/No)
2. If you answered yes to the previous question, how often would you say you use ChatGPT for your academic writing? (Never/Rarely/Sometimes/Often/Always)

APPENDIX 3 - OPEN-ENDED INTERVIEW QUESTIONS

No	Section	Aspect	Adapted From	Questions	Total
1	Tools	Features and Functionalities	Andina et al. (2019) and Schcolnik (2018)	1. What are the features and functionalities of ChatGPT used in academic writing? Please mention.	3
				2. How do you utilize ChatGPT's features in English academic writing?	
				3. How frequently do you use ChatGPT in your academic writing process?	
	Perspectives	Effectiveness and Limitations	Al-Habsi et al. (2021)	4. Based on your experiences, what are the benefits of using ChatGPT in academic writing? Please explain.	4

				5. Based on your experiences, what are the drawbacks of using ChatGPT in academic writing? Please explain.	
				6. What challenges have you faced using ChatGPT in academic writing? Please explain.	
				7. How have you addressed the challenges encountered while using ChatGPT in academic writing? Please explain.	
	Implementation	Integration into Writing	Kawinkoonlasate (2021) and Al-Habsi et al. (2021)	8. How do you integrate ChatGPT into your academic writing process?	4
				9. What notable	

				improvements have you observed in your writing through the integration of ChatGPT? If any, please specify.	
				10. Based on your experience, do you plan to continue using ChatGPT in your academic writing? If yes, why? If not, why not?	

APPENDIX 4 - SEMI-STRUCTURED INTERVIEW QUESTIONS

Tools (4 items):

1. How did you first discover and decide to use ChatGPT for academic writing?
2. Can you share specific features of ChatGPT that you find most beneficial in your academic writing?
3. In what ways have these features influenced your writing process and overall writing outcomes?
4. Have you encountered any challenges or limitations while using ChatGPT's features in academic writing? If yes, please elaborate.

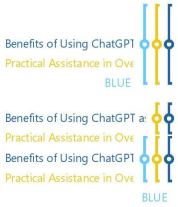
Perspectives (4 items):

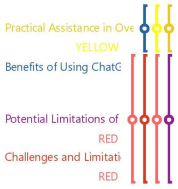
1. How do you perceive the influence of ChatGPT on your writing skills and the quality of your academic work?
2. Can you provide specific examples or instances where ChatGPT has positively or negatively affected your writing outcomes?
3. In your opinion, what role does ChatGPT play in enhancing or limiting your creativity and originality in academic writing?
4. How has the use of ChatGPT impacted your confidence and autonomy in academic writing?

Implementation (4 items)

1. Walk me through a typical instance of how you integrate ChatGPT into your academic writing process.
2. What strategies do you employ to address any challenges or limitations you encounter while using ChatGPT?
3. Have you observed any notable improvements or changes in your writing style or approach as a result of using ChatGPT?
4. Considering your experiences, do you foresee continuing to use ChatGPT in your academic writing in the future? Why or why not?

APPENDIX 5 – INTERVIEW TRANSCRIPT SAMPLE





1 **Tools**

2 Interviewer: How did you first discover and decide to use ChatGPT for academic writing?

3 Interviewee: I first discovered ChatGPT through a recommendation from a classmate who was using it to help with their assignments. They mentioned how it was able to generate ideas and assist with structuring essays, which caught my interest. I decided to try it out because I often struggled with starting my papers and keeping my writing clear and concise. After my first few uses, I realized that ChatGPT was available whenever I needed help, which saved me a lot of time. I didn't have to wait for office hours or schedule time with a tutor.

4 Interviewer: Can you share specific features of ChatGPT that you find most beneficial in your academic writing?

5 Interviewee: Certainly. One of the most beneficial features is the prompt suggestions. Whenever I hit a writer's block, ChatGPT's prompt suggestions gave me the inspiration I needed to start writing again. Its creative and varied prompts helped spark new ideas, allowing me to overcome writer's block and regain my momentum. This feature was instrumental in keeping my writing process dynamic and engaging. For example, when I was writing a literature review, I found it difficult to formulate my arguments, but ChatGPT provided useful prompts that helped me frame my thoughts. Another feature I appreciate i s the language refinement tool, which helps in correcting grammar and improving the overall flow of my writing. It's like having a personal editor on hand, making my work more polished and professional.

6 Interviewer: In what ways have these features influenced your writing process and overall writing outcomes?

7 Interviewee: The features have significantly streamlined my writing process. Instead of spending hours brainstorming or worrying about minor errors, I can focus on developing my ideas and arguments. For instance, the grammar and style suggestions from ChatGPT help me avoid common mistakes and ensure that my writing is clear and concise. However, I've noticed that ChatGPT's feedback was sometimes too general and didn't fully address the complexities of my topic. While it provided valuable insights and suggestions, there were instances where deeper analysis and specific feedback tailored to the nuances of my topic were needed. This encouraged me to seek additional sources and expertise to ensure a comprehensive understanding and thorough exploration of complex ideas in my writing. This means I still need to critically evaluate and refine the output to ensure it meets academic standards.

8 Interviewer: Have you encountered any challenges or limitations while using ChatGPT's features in academic writing? If yes, please elaborate.

9 Interviewee: Yes, I have encountered several challenges. One significant challenge is that ChatGPT's suggestions lacked the critical insight that my work needed. For example, while it could help me with the structure and basic content, it often missed the nuanced analysis required for higher-level academic work. This meant I still had to invest considerable time in ensuring my arguments were robust and well-supported by

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evidence. Additionally, I was worried about the confidentiality of my work and the data I shared with ChatGPT. As I relied on its assistance, I became increasingly cautious of sensitive information and ideas which I wanted to remain secure and protected from unauthorized access or misuse. This concern sometimes made me hesitant to use it fully for sensitive topics, as I wasn't sure how my data would be handled or if it could be accessed by others.

Perspectives

Interviewer: How do you perceive the influence of ChatGPT on your writing skills and the quality of your academic work?

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Interviewee: ChatGPT has had a mixed influence on my writing skills. On one hand, it has improved my efficiency and provided useful initial drafts and ideas. This has helped me produce work faster and with fewer errors. For instance, when I was under a tight deadline, ChatGPT's ability to generate content quickly was invaluable. On the other hand, I feel that relying on it too much might hinder my ability to develop critical thinking and deep analysis independently. The quality of my work has improved in terms of clarity and coherence, but I still need to put in effort to ensure depth and originality, especially in critical analysis.

Interviewer: Can you provide specific examples or instances where ChatGPT has positively or negatively affected your writing outcomes?

Interviewee: Positively, there was a time when I was struggling to start an essay, and ChatGPT's prompt suggestions helped me get past the initial hurdle. This kick-started my writing process and ultimately led to a well-structured essay. Another positive instance was when I used it to help rephrase and improve the clarity of my arguments, which made my final paper more persuasive and readable. Negatively, there were instances where ChatGPT's feedback was too general and didn't fully address the complexities of my topic, which meant I had to do additional research to fill in the gaps. For example, in a complex topic like analyzing political theories, ChatGPT provided broad suggestions that lacked the depth required, making me spend extra time refining those sections.

Interviewer: In your opinion, what role does ChatGPT play in enhancing or limiting your creativity and originality in academic writing?

Interviewee: ChatGPT plays a dual role. It enhances creativity by providing diverse ideas and suggestions that I might not have considered otherwise. For instance, its ability to suggest different angles or perspectives on a topic has often sparked new ideas for me. However, it can also limit originality if relied upon too heavily, as it may encourage a more formulaic approach to writing. If I'm not careful, I might end up using too many of its suggestions verbatim, which can lead to less original work. It's important to use it as a tool for inspiration and support rather than a crutch. I make sure to always add my own insights and personal touch to the content generated by ChatGPT.

Interviewer: How has the use of ChatGPT impacted your confidence and autonomy in academic writing?

Interviewee: The use of ChatGPT has boosted my confidence in terms of writing mechanics and getting started on assignments. Knowing that I have a tool to assist me with grammar,

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structure, and even generating ideas makes me feel more secure and less stressed about the writing process. However, my autonomy has been slightly compromised because I sometimes find myself overly dependent on its suggestions. Striking a balance between using ChatGPT and maintaining my independent critical thinking is key. I'm working on ensuring that I don't rely on it too much and that my own voice and analysis remain prominent in my work.

19 **Implementation**

20 Interviewer: Walk me through a typical instance of how you integrate ChatGPT into your academic writing process.

21 Interviewee: Typically, I start by outlining my ideas and main arguments. I brainstorm and note down key points I want to cover. Then, I use ChatGPT to generate initial drafts or specific sections where I'm struggling. For example, if I'm unsure how to start my introduction, I'll ask ChatGPT for some suggestions or draft an introductory paragraph. I review and refine these drafts, ensuring they meet academic standards and align with my arguments. This often involves adding more detailed analysis, examples, and references. Finally, I use ChatGPT for grammar and spelling checks before submitting my work. Throughout the process, I continually cross-check the content generated by ChatGPT with credible sources to ensure accuracy and integrity.

22 Interviewer: What strategies do you employ to address any challenges or limitations you encounter while using ChatGPT?

23 Interviewee: To address the limitations, I use ChatGPT as a starting point and then build upon its suggestions with my own research and analysis. I always verify the information provided by ChatGPT and supplement it with data from reputable sources. When I encounter feedback that is too general, I delve deeper into my own research to add the necessary depth and critical insight. To mitigate confidentiality concerns, I avoid sharing sensitive information and instead input generalized or anonymized data. Additionally, I make sure to save my work locally and periodically review the terms and conditions of ChatGPT to stay informed about how my data is being used.

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24 Interviewer: Have you observed any notable improvements or changes in your writing style or approach as a result of using ChatGPT?

25 Interviewee: Yes, I've noticed that my writing has become more structured and coherent. The feedback on grammar and style has helped me develop a more polished and professional writing tone. For example, I used to struggle with passive voice and overly complex sentences, but ChatGPT's suggestions have helped me write more clearly and directly. Additionally, my approach to writing has become more methodical, focusing on clear and concise expression. I've also become more adept at identifying and correcting common errors in my writing, which has improved the overall quality of my work.

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26 Interviewer: Considering your experiences, do you foresee continuing to use ChatGPT in your academic writing in the future? Why or why not?

27 Interviewee: Yes, primarily because it saves me time and helps me overcome writer's block. Its ability to provide immediate feedback and suggestions is incredibly valuable, especially when I'm working under tight deadlines. However, I will use it

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judiciously, ensuring that it complements rather than replaces my critical thinking and research efforts. Its role as a supportive tool rather than a primary source of content is crucial for maintaining academic integrity. I believe that with the right balance, ChatGPT can continue to be a beneficial resource in my academic writing process.

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