

Article

# AI in MA Thesis Writing: The Use of Lexical Patterns to Study the ChatGPT Influence

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## Abstract

This paper investigates the use of Artificial Intelligence (AI) in MA thesis writing, addressing a notable gap in existing research that primarily focuses on broader academic contexts. While AI's role in undergraduate essays and general academic writing has been explored, the specific use in the genre of MA theses, characterized by rigorous academic inquiry and advanced scholarly engagement, remains underexplored. This study examines the frequency and contextual usage of specific lexical items in 53 MA theses in linguistics, literature, discourse, and culture studies, aiming to identify patterns indicative of AI-generated content. Employing a systematic comparison of MA theses defended before, and after the release of AI text generators, the research tracks the usage of targeted lexical items to discern deviations suggestive of AI influence. Through analyzing these patterns, the study seeks to provide empirical insights into integrating AI technologies in graduate-level writing, contributing to theoretical understanding and offering practical implications for educational institutions and policymakers. The findings indicate a dramatic increase in the salience of specific lexical items frequently used by ChatGPT compared to the frequency of their use before the release of this text generator. The findings inform the ethical considerations and pedagogical strategies necessary for responsibly incorporating AI into graduate writing instruction, ensuring the integrity of scholarly communication practices.

## Keywords

Artificial Intelligence, MA thesis writing, lexical patterns, ChatGPT influence, academic integrity

## 1. Introduction

The integration of Artificial Intelligence (AI) technologies into various aspects of human life has significantly transformed academic research and writing practices (Bates et al., 2020). AI-powered tools and applications have revolutionized data analysis, enabling researchers to handle vast information efficiently. This transformation extends to academic writing, where AI tools like grammar checkers, plagiarism detectors, and even AI-driven content generators have become invaluable resources for ensuring accuracy, originality, and coherence in scholarly works (Yuan, Li, & Sawaengdist, 2024). However, the rise of AI-generated content also raises concerns regarding academic integrity, authorship, and the potential erosion of critical thinking skills (Teng, 2024). Labadze, Grigolia, and Machaidze (2023) state that:

*By tailoring their interactions to individual students' needs and preferences, chatbots offer customized feedback and instructional support, ultimately enhancing student engagement and information retention. However, there are potential difficulties in fully replicating the human educator experience with chatbots. While they can provide customized instruction, chatbots may not match human instructors' emotional support and mentorship. Understanding the importance of human engagement and expertise*

*in education is crucial. A teacher's role encompasses more than just sharing knowledge. They offer students guidance, motivation, and emotional support—elements that AI cannot completely replicate. (p. 13)*

In higher education, particularly within Master of Arts (MA) theses, the influence of AI, specifically AI text generators, has attracted attention due to its potential impact on scholarly communication and academic integrity (Dwivedi, 2021; Escalante et al., 2023). While AI's role in undergraduate essays and general academic writing has been explored (Glahn, 2024; Sherwood, 2023; Zhang & Wu, 2024), the specific influence on the genre of MA theses, characterized by rigorous academic inquiry and advanced scholarly engagement, remains underexplored. The study seeks to provide empirical insights into the integration of AI technologies in graduate-level writing, contributing to theoretical understanding and offering practical implications for educational institutions and policymakers. This study contributes to the theoretical understanding of AI's impact on academic writing and offers practical implications for educational institutions and policymakers. The results inform ethical considerations and pedagogical strategies necessary for responsibly incorporating AI into graduate writing instruction, ensuring the integrity of scholarly communication practices.

## 2. Literature Review

### 2.1 Evolution of AI text generators

AI text generation has rapidly advanced in recent years, driven by breakthroughs in natural language processing (NLP) and machine learning (Dends & Lui, 2018). Platforms such as OpenAI's GPT (Generative Pre-trained Transformer) models, including GPT-3 and GPT-4, have demonstrated remarkable capabilities in generating coherent and contextually relevant text based on input prompts. These models utilize vast amounts of data to learn language usage patterns, enabling them to produce human-like text across various domains and genres (Kikalishvili, 2023).

AI text generators have revolutionized various facets of academic work (Atlas, 2023). One prominent application is their role in aiding literature reviews and data analysis. AI can swiftly scan and synthesize vast amounts of literature, identifying key themes and extracting relevant information more efficiently than traditional methods (Wagner et al., 2022). This capability accelerates the research process and enhances the comprehensiveness of literature reviews by uncovering overlooked connections and sources.

Moreover, AI text generators are increasingly used to draft initial versions of academic papers (Yeo, 2023). These tools can generate coherent and contextually appropriate text based on input prompts, helping researchers outline arguments, structure content, and articulate complex ideas more effectively. This automated drafting process can reduce the time and effort required for manuscript preparation, thereby boosting research productivity and enabling scholars to focus more on critical analysis and interpretation.

Therefore, AI text generation, particularly through models like GPT-3 and GPT-4, has significantly impacted academic work by efficiently synthesizing literature and aiding in drafting papers (Atlas, 2023; Dends & Lui, 2018; Kikalishvili, 2023). However, this technological advancement also raises concerns. While these tools can facilitate the research process, there is a risk of diminishing scholars' critical engagement and originality, as reliance on AI might lead to less rigorous analysis (Yeo, 2023). Additionally, ethical issues regarding authorship and the authenticity of academic content emerge, questioning the balance between human contribution and machine assistance in scholarly work.

### 2.2 Potential benefits and ethical challenges

Researchers have highlighted several potential benefits of AI text generators in enhancing research productivity and supporting learning outcomes (Baidoo-Anu & Ansah, 2023; Teng, 2024). For

instance, AI can assist novice researchers in learning how to use complex academic writing conventions and improve the quality of their manuscripts (Yeo, 2023). It provides instant grammar, style, and coherence feedback to help refine writing skills and foster a deeper understanding of disciplinary norms and standards (Koltovskaia, 2020).

Furthermore, AI's ability to generate text based on sophisticated algorithms and machine learning models opens new avenues for interdisciplinary collaboration and knowledge dissemination (Cioffi et al., 2020). Researchers can use AI to communicate their findings more effectively across diverse audiences, translating technical jargon into accessible language without compromising scholarly rigor.

Despite the potential benefits, integrating AI text generators in scholarly activities has raised significant ethical concerns (Dwivedi et al., 2023). Central among these concerns is the issue of authenticity and authorship. AI-generated texts may blur the lines between original authorship and automated content creation, posing challenges in attributing intellectual contributions and acknowledging the creative labor of human authors. Ulla et al. (2023) found that Thai EFL teachers have a positive view of ChatGPT for its varied uses in lesson planning and creating language activities. However, they also raise concerns about its reliability, trustworthiness, and the risk of promoting excessive student dependence.

Moreover, there are concerns about maintaining academic integrity and upholding standards of intellectual rigor. While proficient in generating text, AI tools may not possess the critical thinking abilities and contextual understanding that human scholars bring to their research (Darvin & Hafner, 2022). This raises questions about the reliability and credibility of AI-generated content in scholarly discourse, particularly in fields where detailed interpretation and synthesis of information are paramount (Teng, 2023).

Furthermore, robust guidelines and policies within academic institutions are needed to address the ethical implications of AI text generators (Koplin, 2023). Institutions must educate researchers and students on best practices for integrating AI in research and writing processes while upholding principles of academic integrity and ethical conduct.

Empirical studies have illuminated various facets of AI text generators in academic writing, highlighting their utility and their ethical dilemmas (Bonner et al., 2023; Hutson, 2024). Students inadvertently or intentionally incorporated AI-generated text without proper attribution, leading to concerns of plagiarism and academic misconduct (Perkins et al., 2024). Studies show the ethical complexities associated with integrating AI in educational settings, where the distinction between original authorship and automated content creation becomes blurred.

The integration of AI text generators raises fundamental pedagogical and ethical considerations within educational institutions (Nikolopoulou, 2024). From a pedagogical perspective, AI tools offer opportunities to support learning outcomes by assisting students in developing writing skills and conducting research more effectively (Alharbi, 2023). However, educators must balance AI with strategies that foster critical thinking, analytical reasoning, and ethical awareness among students (Khreisat, 2024).

Ethically, the reliance on AI text generators challenges traditional norms of academic authorship and intellectual property. Scholars argue that while AI can enhance productivity and generate high-quality content, it lacks the human capacity for judgment, creativity, and contextual understanding essential for scholarly inquiry (Messeri & Crockett, 2024). Consequently, there is a risk that AI-generated content may compromise the authenticity and rigor expected in academic research and writing. Researchers and educators advocate for clear guidelines and educational strategies to educate students about the proper use of AI tools (Miao et al., 2021), emphasizing ethical conduct, attribution practices, and the importance of originality in scholarly work.

Moreover, integrating AI text generators necessitates ongoing discussions within academic communities about the ethical implications of technological advancements (Vetter et al., 2024). Institutions play a crucial role in establishing policies that promote responsible use of AI, ensuring transparency and accountability in research practices. Additionally, genre analysis can play a significant role in detecting and identifying the salient styles and lexical choices that are likely to be written by AI.

Hence, AI text generators enhance research productivity and assist in mastering academic writing, offering significant benefits like interdisciplinary collaboration and accessible communication (Baidoo-Anu & Ansah, 2023; Yeo, 2023). However, these tools raise ethical concerns, particularly regarding authorship, academic integrity, and the potential for plagiarism (Dwivedi et al., 2023). AI's lack of critical thinking and contextual understanding challenges the rigor and authenticity of academic work, necessitating clear guidelines and educational strategies to ensure responsible use while preserving ethical standards in research (Miao et al., 2021; Vetter et al., 2024).

### 2.3 Genre analysis and academic writing conventions

Genre analysis is a foundational framework for understanding how discourse conventions influence communication within specific academic genres, such as the MA thesis. This sub-section explores the principles of genre analysis, its significance in academic contexts, and its application in understanding the norms and expectations that govern scholarly writing practices. Genre analysis in academic contexts traces its origins to the seminal work of Swales (1990), who pioneered the systematic study of genres as socially constructed communicative events. Swales emphasized the role of rhetorical structures and communicative purposes in shaping scholarly discourse, arguing that genres are not merely forms of writing but social actions that serve specific communicative functions within disciplinary communities.

Academic writing genres, such as the MA thesis, are characterized by distinctive linguistic features, textual patterns, and rhetorical strategies that reflect disciplinary norms and conventions (Hyland, 2004). Genre analysis seeks to uncover these underlying conventions by examining how language is used to achieve specific communicative goals and to establish credibility and authority within academic discourse. Genre analysis provides researchers and educators with a systematic approach to studying the norms and expectations embedded within academic writing genres. Through analyzing linguistic features, structural elements, and rhetorical moves employed in texts, genre analysts can identify recurrent patterns and conventions that define disciplinary practices (Hyland, 2004).

In the context of the MA thesis, genre analysis explains how writers conform to established conventions while constructing and presenting their research findings. This analytical framework allows researchers to dissect the specific linguistic, structural, and rhetorical elements that align with disciplinary norms, such as the organization of chapters, citation practices, and argumentation strategies. Researchers use genre analysis to explore how genres evolve, adapt to new contexts, and incorporate technological advancements such as digital tools for data analysis or AI text generators, which may influence writing styles, structure, and presentation. This adaptability highlights how the genre of the MA thesis responds to emerging academic practices and technological innovations, which helps in understanding of the continuous transformation in scholarly writing practices.

The integration of AI text generators introduces new dimensions to genre analysis within academic writing. AI tools influence not only the production but also the reception and interpretation of texts within scholarly communities. Genre analysts must consider how AI-generated content aligns with or challenges traditional genre conventions, particularly regarding clarity, coherence, and the authoritative voice expected in academic writing (Hyland, 2004).

It informs pedagogical practices by providing insights into how students can effectively master disciplinary writing conventions. Educators can use genre-based approaches to scaffold students' understanding of genre expectations, helping them develop proficiency in academic writing while fostering critical thinking and analytical skills (Swales, 1990). Furthermore, genre analysis aids in curriculum development and assessment practices by articulating explicit criteria for evaluating student writing based on disciplinary norms and expectations. This approach ensures that academic programs maintain rigor and coherence in teaching writing across diverse disciplines and educational contexts (Kessler, 2017).

Moreover, the issue of intellectual ownership arises as AI technologies blur the lines between human-authored and machine-generated texts. Scholars argue that while AI can facilitate content creation, it lacks the creative agency and contextual understanding that characterize human scholarly endeavors (Shukla, 2023). Therefore, clarifying the roles of AI in research and writing processes becomes essential to uphold standards of intellectual rigor and authorial responsibility.

Therefore, genre analysis is essential for understanding academic writing conventions, as established by Swales (1990), who framed genres as socially constructed communicative events. It helps reveal how linguistic and rhetorical patterns reflect disciplinary norms and informs pedagogical practices by guiding students in mastering these conventions (Hyland, 2004).

### 3. Rationale for the Present Study

The integration of Artificial Intelligence (AI) in academic writing has gathered significant attention in recent years. However, there remains a distinct gap in understanding its specific implications within the genre of MA theses. While existing literature has explored AI's impact on broader academic writing contexts, such as undergraduate essays, the unique dynamics and scholarly expectations of MA theses have received comparatively less scrutiny. This section discusses the need to fill this gap and outlines how this study aims to contribute to the understanding of AI's influence on scholarly communication practices at the graduate level.

The literature on AI in academic writing predominantly focuses on its broader implications across various educational levels and disciplines (Godwin-Jones, 2022). Godwin-Jones (2022) study involved reviewing research studies on AI-enabled writing tools, including systems for automated writing evaluation, predictive text technology, and text generation. The results indicated that these tools significantly enhance the quality of written texts by providing automated feedback and generating content, benefiting both students and teachers when integrated into instructional settings. The findings also highlight the importance of teacher mediation in helping learners effectively use these technologies and gain meta-linguistic knowledge, emphasizing the need for a broad ecological perspective on their impact. Studies have also examined AI's role in aiding literature reviews, drafting initial versions of papers, and enhancing research productivity.

Edmett, Ichaporia, Crompton, and Crichton (2023) presented findings from a global survey of 1,348 English language teachers across 118 countries, analyzing both numerical responses and qualitative commentary. The study explored key themes through 19 in-depth interviews with diverse stakeholders in the field, aiming to capture a wide range of perspectives on AI in English language teaching (ELT). Findings of the study revealed that the majority of the respondents reported using AI-powered tools, reflecting a general optimism about their potential to offer customized resources, foster independent learning, and enhance specific language skills. However, concerns persist regarding over-dependence on technology, reduced human interaction, and the limitations of AI in understanding language and cultural nuances. Teachers also highlighted the essential role of human involvement in education and expressed a need for improved training to effectively integrate AI into their teaching practices.

Additionally, ethical concerns regarding attribution, transparency, and intellectual ownership of AI-generated content have been extensively discussed (Busso and Sanchez, 2024). Busso and Sanchez (2024) reviewed literature and case studies to evaluate the potential of Artificial Intelligence in Education (AIEd) to improve communicative competence in Japanese EFL programs. Their findings indicated that AI tools can alleviate psychological barriers to speaking, enhance confidence and fluency, and provide personalized learning experiences. Despite some challenges, such as data privacy and potential overreliance, the study argues that AI can effectively address key issues in Japanese EFL education and supports its integration into curricula to better prepare students for global communication.

In spite of these various studies related to AI in education, the genre-specific impact of AI in MA theses remains a gap that this paper seeks to contribute to filling. MA theses represent a distinct genre characterized by rigorous academic inquiry, advanced scholarly engagement, and specialized disciplinary

knowledge. Understanding how AI technologies intersect with the conventions and expectations of MA thesis writing is important for assessing their implications on scholarly communication and educational outcomes at the graduate level.

This study addresses the aforementioned gap by examining the frequency and contextual usage of specific lexical items in MA theses that may indicate the use of AI text generators. The research aims to provide empirical insights into the influence of AI technologies on scholarly writing practices among graduate students by focusing on these lexical items, which have been identified through preliminary observations and comparative analysis with AI-generated texts.

The present study aims to answer the following questions:

1. How has the frequency and contextual usage of specific lexical items in MA theses in linguistics, literature, discourse, and culture studies changed after AI text generators, such as ChatGPT, compared to the period before their release?
2. What patterns in the usage of targeted lexical items are indicative of AI influence in graduate-level writing, and how can these patterns inform the development of ethical guidelines and pedagogical strategies for incorporating AI technologies in academic instruction?

These research questions target the core objectives of the study, focusing on the comparative analysis of lexical item usage before and after the release of AI text generators. The study aims to uncover patterns that suggest AI influence, providing valuable insights into the impact of AI on academic writing. Additionally, the findings promise to inform ethical guidelines and pedagogical strategies, ensuring the responsible integration of AI in graduate-level education.

## **4. Methods**

The research employs a systematic comparative approach to analyze MA theses from the Faculty of Arts and Humanities at the University of Kairouan, Tunisia, both before and after the official release of AI text generators. The study seeks to identify patterns indicative of AI-generated content by tracking the frequency and variations of targeted lexical items across these theses. As Chair of the MA Committee responsible for screening theses before assigning a defense committee, the researcher had access to these manuscripts, which ranged from 60 to 120 pages. Throughout the study, the authors' identities were kept anonymous to ensure confidentiality. This comparative analysis enables researchers to discern whether there is a significant deviation in using these lexical items post-AI integration, thereby, the impact of AI on scholarly communication practices within the MA thesis genre.

The findings of this study are expected to contribute to theoretical understanding and practical implications in several ways. They will expand our knowledge of how AI technologies are shaping academic writing practices at an advanced educational level, offering insights into the adaptation of AI in specialized genres like the MA thesis. The study will also inform educational institutions and policymakers about the ethical considerations and pedagogical strategies necessary to integrate AI responsibly into graduate-level writing instruction.

The methodology employed in this study involves a comparative analysis of the frequency of specific lexical items before and after the official release of ChatGPT in a sample of 53 MA theses. This comparative approach allows for identifying any significant deviations in the use of targeted lexical items, which could potentially signify the influence of AI text generation tools.

### **4.1 Procedure**

To conduct this investigation, the following procedure was followed:

1. Identification of Salient Lexical Items: Through systematic observation, the researcher identified a set of 11 lexical items that were frequently used in both student-authored MA theses and essays generated by AI text generators like ChatGPT.

2. Derivation Tracking: The researcher traced the different forms and derivations of these identified lexical items to track their usage frequency.
3. Frequency Counting: Using Microsoft Word and PDF reader search functionalities, the researcher quantified the number of times each targeted lexical item or its derivation appeared in the selected theses, both before and after the release of ChatGPT.
4. Establishing a Threshold: The highest number of these lexical items in theses completed before the official release date of ChatGPT (November 30th, 2022) was established as a baseline or threshold. Any thesis exceeding this number raised suspicion of potential AI text generator use.
5. Documentation and Analysis: Data on the frequency of each lexical item were meticulously documented in an Excel spreadsheet, facilitating detailed analysis and comparison.

## 4.2 Hypothesis

The present paper hypothesized that the following lexical items are recurrent in both student-authored theses and AI-generated texts:

- Delve into / delves into / delving into
- Realm / realms
- Multifaceted / multi-faceted
- Tapestry / tapestries
- The journey: only when used rhetorically
- Pivotal
- Underscore / underscoring / underscores
- Intricate / intricacy / intricacies
- By + v + ing (only at the beginning of the sentence)
- Overall: Only at the beginning of the sentence
- Navigate / navigating
- Shed light / sheds light / shedding light

## 4.3 Characteristics of the lexical items

The table below identifies the categories of the lexical items and sample sentences clarifying them.

Table 1

*Categories of the Lexical Items*

Lexical Item	Category	Example Sentence
Delve into / delves into / delving into	Verb phrase	The thesis delves into the ethical implications.
Realm / realms	Noun	Within the realm of artificial intelligence.
Multifaceted / multi-faceted	Adjective	A multi-faceted approach to data analysis.
Tapestry / tapestries	Noun	The thesis weaves together various tapestries of theory.
The journey: only when used rhetorically	Phrase (rhetorical usage)	The journey of discovery in literature.
Pivotal	Adjective	The findings are pivotal to understanding.

Underscore / underscoring / underscores	Verb	This underscores the importance of methodology.
Intricate / intricacy / intricacies	Adjective (intricate) / Noun (intricacy, intricacies)	The intricacies of neural network design.
By + v + ing	Prepositional phrase	By examining different methodologies.
Overall: Only at the beginning of the sentence	Adverb (position-specific)	Overall, the thesis contributes to AI research.
Navigate / navigating	Verb	Navigating the complexities of AI ethics.
Shed light / sheds light / shedding light	Phrase	The study sheds light on AI's impact on society.

Overreliance on these lexical items is hypothesized to indicate the potential use of AI text generators. These lexical items are typified in the table below to SFL metafiction as follows:

Table 2

*Metafunctions of the Selected Lexical Items*

Lexical Item	SFL Metafunction	Explanation
Delve into / delves into / delving into	Experiential	Represents the process of exploring or investigating a topic.
Realm / realms	Experiential	Refers to a domain or sphere of knowledge, categorizing different aspects of experience.
Multifaceted / multi-faceted	Experiential	Describes the complexity and multiple aspects or facets of a topic or phenomenon.
Tapestry / tapestries	Experiential	Metaphorically represents a complex interweaving of different elements or perspectives.
The journey: only when used rhetorically	Textual (rhetorical)	Serves a rhetorical function to engage the reader in a metaphorical journey through the discourse.
Pivotal	Experiential	Indicates the importance or centrality of something within the experience or discourse.
Underscore / underscoring / underscores	Textual	Functions to highlight or emphasize important points within the text.
Intricate / intricacy / intricacies	Experiential	Describes the detailed and complex nature of a topic or phenomenon.
By + v + ing	Textual	Specifies the means or method by which an action or process is performed within the text.
Overall: Only at the beginning of the sentence	Textual	Functions as a discourse organizer, providing an overview or summary at the beginning of a section or text.



Navigate / navigating	Experiential	Represents the process of guiding or directing through a course or discourse.
Shed light / sheds light / shedding light	Textual	Functions metaphorically to illuminate or provide insight into a topic or issue within the discourse.

Each lexical item can be typified according to its predominant function within Systemic Functional Linguistics (SFL):

- **Experiential Metafunction:** Lexical items such as “delve into,” “multifaceted,” “intricate,” and “navigate” primarily engage with representing the process of exploration, complexity, and navigation through scholarly content. Their frequent use in MA theses indicates a deep engagement with research topics and methodologies.

- **Textual Metafunction:** Terms like “underscore,” “by + v + ing,” and “overall” function to organize discourse by highlighting important points, specifying methods, and structuring information cohesively. These lexical items contribute to the overall coherence and clarity of academic arguments presented in theses.

## 5. Results

AI-driven text generation tools, such as OpenAI’s ChatGPT, has revolutionized the domain of academic writing. These tools have the potential to greatly assist students in producing high-quality written content but also raise significant questions about originality, authenticity, and the overall impact on academic standards. This study explored the specific changes in lexical choices within MA theses before and after the release of ChatGPT on November 30, 2022. It aims to understand the broader implications of AI integration in scholarly writing by examining the recurrence of certain lexical items.

### 5.1 AI index average

The AI index average, which measures the frequency of suspected AI-generated lexical items, increased dramatically from 10 before the release of ChatGPT to 32 afterward. This threefold increase suggests a significant influence of AI tools on the lexical choices of students writing their MA theses. This index indicates the average of times the targeted lexical items have been mentioned in theses before and after the release of ChatGPT.

The comparative analysis reveals several key trends. The AI index average increased markedly from 10 before the release of ChatGPT to 32 afterward, indicating a substantial rise in the use of AI-influenced language. The table below identifies the recurrence of suspected AI lexical items before and after the release of ChatGPT.

Table 3

*Recurrence of Suspected AI Lexical Items Before and After November 30, 2022, in MA Theses*

	Before the release of chatgpt	After the release of chatgpt
Ai index average	10	32
Extremes (lowest/highest)	0	0
	19	276

## 5.2 Extremes in lexical item recurrence

While the lowest recurrence of suspected AI lexical items remains at 0, the highest recurrence experienced a dramatic jump from 19 to 276. These numbers suggest a significant transformation in writing patterns attributable to AI text generators. The integration of AI technologies such as OpenAI's ChatGPT into academic writing practices represents a significant shift in how scholarly content is generated and refined. The implications of this are given as follows.

### 5.2.1 Enhanced language sophistication

The rise in the AI index average likely reflects the sophisticated language that AI tools introduce into academic writing. AI-generated content often incorporates advanced vocabulary and complex sentence structures, which can elevate the perceived quality of the theses. This sophistication drives readers to think that what they are reading is too good to be true especially from English as a Second language learners.

### 5.2.2 Homogenization of writing styles

The marked increase in the AI index average may indicate a trend towards homogenized writing styles. As more students use AI tools, the distinctiveness of individual writing styles might diminish, leading to a more uniform approach to academic writing. This homogenization is what triggers the attention of teachers and raises their concerns about the originality of the work and authorship. The extremes in recurrence can serve as indicators of AI use in academic writing. For instance, a thesis exhibiting a very high frequency of certain phrases might suggest heavy reliance on AI text generation. This can be useful for educators and institutions seeking to understand the extent of AI integration in student work.

### 5.2.3 Reliance on AI assistance

The significant rise in the AI index suggests that students are increasingly relying on AI tools to replace them in their writing. This dependency can be beneficial for improving the clarity and coherence of their work but raises concerns about the development of independent writing skills. The goal behind asking students to write theses is to develop their writing skills in addition to enhancing their communication skills. The increase in the highest recurrence raises questions about academic integrity. If AI tools are excessively contributing to the writing process, it may blur the lines of authorship and intellectual ownership. This necessitates the establishment of clear guidelines and ethical standards for AI use in academic contexts. There is no point in evaluating these skills if ChatGPT is the one writing for them.

## 5.3 Plagiarism index and specific lexical items

The overall plagiarism index saw a 3% decrease, dropping from 28% before the release of ChatGPT to 25% after. This decrease might suggest that AI tools are helping students produce less clearly plagiarized work or that they are modifying text just enough to evade traditional plagiarism detection methods. However, the dramatic increase in certain lexical items points towards a homogenization of language use. The table below shows the difference in the use of lexical items before and after the release of ChatGPT.

Table 4

*Recurrence of Lexical Items Before and After the Release of ChatGPT*

Totals	Before AI	After AI	Difference	Percentage of increase after AI
Plagiarism index	28%	25%	-3	-3

Totals	Before AI	After AI	Difference	Percentage of increase after AI
Delve into/ delving into	16	64	48	300
Realm	37	117	80	216
Multi-faceted/ multifaceted	4	35	31	775
Tapestry	2	9	7	350
The journey	10	56	46	460
Pivotal	13	70	57	438
Underscore/ Ing	4	114	110	2750
Intricate/ intricacy/ies	29	92	63	217
By + doing	53	91	38	72
Overall (at the beginning of a sentence)	25	60	35	140
Navigate/ navigating	2	50	48	2400
Shed light/ sheds light	71	84	13	18
Total	266	842	576	217

#### 5.4 Analysis of specific lexical items

This sub-section will provide a detailed analysis of findings related to each lexical item and a possible explanation for the shift in its frequency of use before and after the release of ChatGPT.

- **Delve into/Delving into:** The usage of this phrase increased from 16 to 64, a significant 300% rise. This term is often used in academic writing to indicate a thorough investigation. The increased use suggests that AI-generated content frequently emphasizes in-depth analysis, potentially enhancing the perceived rigor of the theses.

- **Realm:** The frequency of the term “realm” rose from 37 to 117, marking a 216% increase. This term is typically employed in discussions of theoretical or conceptual frameworks. The rise in its usage indicates that AI tools might be promoting a more abstract and theoretical approach in writing.

- **Multi-faceted/Multifaceted:** The occurrence of this term jumped from 4 to 35, a 775% increase. This suggests that AI-generated content often employs complex and nuanced vocabulary, possibly to enhance the sophistication of the writing.

- **Tapestry:** This term, which had minimal use before the release of ChatGPT, saw an increase from 2 to 9. While the numerical increase is small, the 350% rise in percentage terms is noteworthy. This indicates a shift towards more metaphorical and descriptive language in AI-assisted writing.

- **The Journey:** The frequency of this phrase increased from 10 to 56, a 460% rise. This phrase is commonly used in narrative or metaphorical contexts, suggesting that AI tools may be encouraging a more narrative style in academic writing.

- **Pivotal:** The term “pivotal” saw its usage increase from 13 to 70, a 438% rise. This term highlights key elements or turning points, indicating that AI-generated content might be emphasizing critical components more frequently.

- **Underscore/Underscoring:** The occurrence of this term rose dramatically from 4 to 114, a 2750% increase. This suggests that AI content often uses this term to highlight important points, contributing to a more emphatic and clear writing style.

• **Intricate/Intricacy/ies:** The frequency of this term increased from 29 to 92, a 217% rise. This indicates a preference for describing detailed and complex ideas, which may enhance the depth of academic discussions.

• **By + Doing:** The phrase “by doing” increased from 53 to 91, a 72% rise. This procedural phrase suggests that AI-generated content often emphasizes methodology and process, aligning with academic norms that stress how research is conducted.

• **Overall (at the beginning of a sentence):** The usage of this summarizing term increased from 25 to 60, a 140% rise. This indicates that AI tools might be promoting more frequent summarization and synthesis of information.

• **Navigate/Navigating:** The term “navigate/navigating” saw a significant increase from 2 to 50, a 2400% rise. This suggests a focus on process and exploration, which are key components of academic research.

• **Shed Light/Sheds Light:** The usage of this explanatory phrase increased from 71 to 84, an 18% rise. This modest increase suggests a slight preference for terms that clarify and elucidate complex topics.

### 5.5 Comparative analysis of top 10 lexical items before and after ChatGPT

The data indicate a mixed impact on the top 10 lexical items most commonly used before and after the release of ChatGPT. The table below highlights significant changes in the recurrence of specific lexical items in MA theses before and after the release of ChatGPT.

Table 5

*Recurrence of Lexical Items Before and After the Release of ChatGPT in the Top 10 MA Theses*

Totals	Total of top 10 before AI	Total of top 10 after AI	Difference	Percentage of increase
Plagiarism index	28,4	21,9	-7	-13
Delve into/ delving into	5	61	56	1120
Realm	20	109	89	445
Multi-faceted/ multifaceted	1	31	30	3000
Tapestry	0	9	9	Infinite
The journey	5	46	41	820
Pivotal	7	59	52	743
Underscore/ ing	4	114	110	2750
Intricate/ intricacy/ies	18	88	70	389
By + doing	40	72	32	80
Overall (at the beginning of a sentence)	16	53	37	231
Navigate/ navigating	0	48	48	Infinite
Shed light/ sheds light	39	43	4	10
number of AI generated paragraphs	155	733	578	373

The observed increases suggest a substantial impact of AI on academic writing practices. This subsection provides a detailed analysis of these findings, examining the implications of each lexical item.

**Delve into/Delving into:** The use of the phrase “delve into/delving into” surged from 5 to 61 instances, reflecting a 1200% increase. This significant uptick suggests that AI tools favor this expression

to emphasize thorough exploration and detailed analysis. In academic writing, “delve into” signals a deep dive into a particular topic or issue, aligning with the conventions of rigorous scholarly investigation. The preference for this phrase by AI-generated content indicates a tendency to frame discussions in a manner that underscores the depth and comprehensiveness of the analysis.

**Realm:** The term “realm” saw a significant rise from 20 to 109 instances, a 454% increase. The frequent use of this term indicates AI's propensity for engaging in theoretical and abstract discussions. “Realm” is often used to denote a field or domain of study, adding a layer of sophistication and breadth to the discourse. The increase in the use of this term suggests that AI-generated content is enhancing the depth and complexity of scholarly writing, encouraging a more expansive engagement with the subject matter.

**Multi-faceted/Multifaceted:** With an increase from 1 to 31 instances, a 3000% rise, the term “multi-faceted/multifaceted” implies that AI tools are promoting more complex and multi-dimensional descriptions. This term is used to describe subjects that have multiple aspects or components, contributing to a richer academic narrative. The heightened use of this term suggests that AI-generated content is encouraging a more holistic and detailed examination of topics, which can lead to a more comprehensive understanding and presentation of research findings.

**Tapestry:** The term “tapestry” rose from 0 to 9 instances, reflecting an infinite (as it doubled from zero) increase. This metaphorical term suggests that AI-generated content is incorporating more descriptive and illustrative language, enriching the textual quality. “Tapestry” is often used to convey a complex and interwoven structure, which can enhance the vividness and expressiveness of academic writing. The increase in the use of this term indicates a shift towards more evocative and imaginative descriptions, which can make the content more engaging and memorable.

**The Journey:** The phrase “the journey” increased from 5 to 46 instances, an 820% rise. This indicates that AI tools might be encouraging a more narrative and process-oriented approach in academic writing. “The journey” is often used to describe the progression of research or the development of ideas, framing the discourse in a way that highlights the process and evolution of scholarly inquiry. The increased use of this phrase suggests that AI-generated content is fostering a more dynamic and story-like presentation of research, which can enhance the reader's engagement and understanding.

**Pivotal:** The term “pivotal” increased from 7 to 59 instances, a 743% rise. This suggests that AI-generated content often highlights critical points and key components more frequently. “Pivotal” is used to denote elements that are of central importance, aligning with the emphasis on significant findings in academic research. The increased use of this term indicates that AI tools are focusing on identifying and highlighting the most important aspects of the discourse, contributing to a more focused and impactful presentation of research outcomes.

**Underscore/Underscoring:** The frequency of the term “underscore/underscoring” rose from 4 to 114 instances, a 2750% increase. This indicates that AI-generated content frequently emphasizes important points, contributing to a more emphatic and persuasive writing style. “Underscore” is used to highlight or emphasize key points, reinforcing the importance of certain elements within the discourse. The increased use of this term suggests that AI tools are enhancing the clarity and persuasiveness of academic writing by consistently drawing attention to critical aspects of the argument.

**Intricate/Intricacy/ies:** The term “intricate/intricacy/ies” witnessed a rise from 18 to 88 instances, a 389% increase. This suggests a preference for detailed and complex descriptions, enhancing the academic rigor of the text. “Intricate” denotes complexity and detailed structure, which are essential characteristics of thorough and sophisticated scholarly analysis. The increased use of this term indicates that AI-generated content is fostering a more rigorous and meticulous approach to academic writing, contributing to the overall depth and precision of the research.

**By + verb in the ing form:** The phrase “by + verb in the ing form” increased from 40 to 72 instances, an 80% rise. This indicates that AI-generated content often stresses methodology and procedural aspects, aligning with academic conventions. “By doing” is used to describe actions or methods undertaken during the research process, emphasizing the procedural dimension of scholarly inquiry. The increased

use of this phrase suggests that AI tools are enhancing the methodological rigor of academic writing, providing a clearer and more detailed account of the research process.

**Overall (at the beginning of a sentence):** The use of the summarizing term “overall” rose from 16 to 53 instances, a 231% increase. This suggests that AI tools might be promoting more frequent synthesis and summarization of information, aiding in clearer and more structured arguments. “Overall” is used to introduce a summary or a general conclusion, helping to synthesize the preceding discussion. The increased use of this term indicates that AI-generated content is enhancing the coherence and clarity of academic writing by facilitating more effective summarization and synthesis of complex information.

**Navigate/Navigating:** The term “navigate/navigating” increased from 0 to 48 instances, an infinite rise. This implies a focus on process and exploration, which are critical elements in academic research. “Navigate” is used to describe the act of exploring or maneuvering through complex issues or ideas, highlighting the exploratory nature of scholarly inquiry. The increased use of this term suggests that AI tools are encouraging a more process-oriented and exploratory approach to academic writing, emphasizing the dynamic and investigative aspects of research.

**Shed light/sheds light/shedding light:** The 10% increase in the usage of “shed light” from 39 to 43 implies a focus on enhancing clarity and understanding in academic writing. AI's role in promoting the use of such terms reflects a broader trend towards fostering lucidity and explanatory depth in scholarly communication. Students resorting to AI tools may utilize “shed light” to articulate the significance and implications of their findings, thereby enriching the quality and impact of their research contributions. This trend exemplifies AI's influence in encouraging a more elucidative and informative approach to academic writing, aligning with the imperative to communicate research outcomes effectively to peers and broader audiences.

## 6. Discussion

These findings provide evidence that AI-generated content is influencing academic writing styles in several notable ways. Firstly, the increased use of abstract and theoretical approaches in AI-generated theses indicates a trend towards more complex and nuanced vocabulary. This shift towards sophisticated language may aim to elevate the perceived rigor and depth of scholarly discourse, potentially catering to academic expectations of intellectual engagement and complexity. Such a finding correlates with Wagner et al (2022) and suggests a significant transformation in how academic knowledge is generated and presented. While the use of sophisticated vocabulary and narrative styles may enhance the perceived rigor and engagement of academic writing, it also raises concerns about the authenticity and originality of scholarly contributions. AI's ability to generate complex language and persuasive narratives challenges traditional notions of authorship and intellectual creativity, prompting questions about the extent to which AI-assisted texts reflect genuine scholarly insights versus synthesized information.

Secondly, AI tools appear to promote a narrative style in academic writing, as indicated by their emphasis on metaphorical and descriptive language. This narrative approach adds richness to the presentation of ideas and suggests a move towards crafting persuasive and engaging academic narratives that captivate readers and convey complex concepts effectively. This finding aligns with Yeo's (2023) claims on how AI tools assist in drafting academic papers. Yeo (2023) highlights that AI-generated text can be coherent and contextually appropriate, helping researchers articulate complex ideas more effectively. Moreover, the frequent use of terms highlighting critical components in AI-generated content shows a preference for clarity and emphasis on key points. This practice contributes to a more emphatic and clear writing style, aligning with academic norms that prioritize precision and coherence in scholarly communication. On the other hand, the reliance on AI to structure and emphasize content may homogenize writing styles and inhibit diverse approaches to academic inquiry and argumentation. This could potentially diminish the diversity of voices and perspectives in scholarly discourse, crucial

for fostering innovative and inclusive academic environments. This confirms Kikalishvili (2023) claims that while AI tools can produce human-like text across various domains, they also raise concerns about diminishing scholars' critical engagement and originality.

Students' integration of AI into MA thesis writing has led to the overuse of specific lexical patterns, reflecting both experiential and textual metafunctions. This trend raises concerns about the authenticity and quality of graduate-level academic writing. The overuse of these terms, commonly associated with AI-generated content, suggests a potential dependence on AI tools that may hinder genuine scholarly engagement and critical thinking. These findings highlight the urgent need for ethical considerations and the development of pedagogical strategies to ensure the responsible use of AI in academic writing, safeguarding the integrity and originality of scholarly communication practices. Busso and Sanchez (2024) also addressed ethical concerns regarding attribution, transparency, and intellectual ownership of AI-generated content.

In fact, in examining the impact of AI on MA thesis writing through the lens of Systemic Functional Linguistics (SFL), significant and possibly problematic changes in the usage of specific lexical items have been observed. The experiential metafunction, which focuses on representing processes and complexity, is evident in the overuse of terms like "delve into," "realm," "multi-faceted," "tapestry," "the journey," and "navigate." These terms, often associated with AI-generated content, indicate a superficial engagement with research topics and methodologies. Their excessive use suggests that AI tools might be promoting an artificial sense of depth and complexity in academic writing, potentially compromising the authenticity of scholarly inquiry.

The textual metafunction, responsible for organizing discourse for coherence and clarity, is similarly affected by AI-generated content. The overuse of terms such as "pivotal," "underscore," "by doing," "overall," and "shed light" raises concerns. While these terms help structure information and highlight key points, their frequent occurrence could indicate a reliance on AI tools to produce emphatic and clear academic arguments. This over-reliance may lead to formulaic and predictable writing patterns, undermining the originality and critical thinking expected in MA theses. The textual metafunction's role in promoting structured discourse is thus compromised by the mechanical application of these lexical items.

This reliance on AI-generated content can result in writing that appears polished on the surface but lacks the depth and originality that come from genuine intellectual effort and critical thinking. The overuse of these terms thus risks creating a homogenized academic discourse where distinct voices and innovative ideas are suppressed in favor of predictable and standardized language patterns. Messeri and Crockett (2024) also highlighted this when they claimed that although AI can boost productivity and produce high-quality content, it falls short of the human qualities of judgment, creativity, and contextual comprehension needed for genuine scholarly work.

The textual metafunction, which aims to promote cohesive and coherent discourse, is compromised when AI tools dominate the writing process. The repeated use of certain lexical items can make academic writing seem monotonous and repetitive, detracting from the reader's engagement and the thesis's overall impact. This over-reliance on AI-generated content can undermine the integrity of scholarly work, as the originality and critical analysis that are hallmarks of graduate-level research become diluted. Furthermore, the mechanical structuring of arguments can obscure the writer's unique perspective, leading to a diminished capacity for developing complex and well-substantiated arguments. In this context, the role of AI in academic writing needs careful scrutiny to ensure that it supports rather than supplants the intellectual rigor and creativity essential to advanced scholarship. Teng (2024) stated similar broader implications of AI-generated content on academic integrity and the erosion of critical thinking skills. He pointed out that AI's dominance in the writing process can obscure the writer's unique perspective and reduce the capacity for developing complex, well-substantiated arguments.

The overuse of specific lexical items such as "delve into," "realm," "multi-faceted," "tapestry," "the journey," "pivotal," "underscore," "by doing," "overall," "navigate," and "shed light" by ChatGPT has a significant correlation with the marked increase in their appearance in MA students' theses after the

release of ChatGPT. This trend suggests that students might be copying from AI tools like ChatGPT to polish their writing, leading to a noticeable shift in canonical lexical patterns' use. These findings map with Bonner et al. (2023) and Perkins et al. (2024). Before the release of ChatGPT, the use of these terms was minimal, indicating a more human-like and varied approach to academic writing. The sharp rise in their usage post-ChatGPT reveals a possible dependency on AI-generated content, which raises critical concerns about the authenticity and originality of student work.

As maintained by Miao et al. (2021) and Vetter et al. (2024), this study found that mechanical and repetitive use of these terms reflects how AI-generated content can produce refined but formulaic writing. This pattern of overuse implies that while AI tools can enhance the clarity and structure of academic arguments, they also risk homogenizing the language and style of academic theses. The emphasis on certain lexical items might artificially inflate the perceived rigor and sophistication of the writing, masking a lack of genuine critical engagement and intellectual effort. This reliance on AI-generated phrases can create a superficial layer of complexity, which may be misleading in terms of the actual depth of analysis and originality in the students' work.

## **7. Implications of the Study**

These findings show the transformative impact of AI technologies like ChatGPT on academic writing. While AI tools can enhance the quality and sophistication of theses, they also bring about several challenges and considerations. These challenges include quality and originality, ethical considerations, and pedagogical strategies. AI tools can significantly improve the quality of writing by suggesting advanced vocabulary and refining sentence structures. However, the homogenization of writing styles poses a risk to the originality and uniqueness that are symbols of scholarly work. Educational institutions must balance the benefits of AI with the need to preserve individual creativity and original thought. This can be done through encouraging the use of AI only at the brainstorming phase not the writing phase. AI should be used as an aid to understand phenomena, deconstruct themes, identify main topics to focus on but not as a substitute to the researcher in writing.

The dramatic increase in the recurrence of suspected AI lexical items highlights the ethical challenges associated with AI in academic writing. Clear guidelines must be established to delineate the acceptable use of AI tools, ensuring that students do not over-rely on these technologies at the expense of developing their writing skills. Institutions should promote transparency, requiring students to disclose the extent of AI assistance in their work. Educators need to adapt their teaching strategies to address the influence of AI on academic writing. This includes incorporating discussions on the ethical use of AI, training students to critically evaluate and refine AI-generated content, and emphasizing the importance of developing independent writing skills. By doing so, educators can help students use AI tools effectively while maintaining academic integrity.

The recurrence of suspected AI lexical items in MA theses before and after the release of ChatGPT reveals a significant shift in academic writing practices. The increase in the AI index average and the extremes in lexical item recurrence underscore the profound influence of AI tools on student writing. While these technologies offer numerous benefits, including enhanced writing quality and sophistication, they also pose challenges related to originality, academic integrity, and ethical use. It is imperative for educators, institutions, and policymakers to address these challenges by establishing clear guidelines and promoting responsible AI use in academic contexts. A part of this effort is familiarizing teachers with salient features of AI content, drawing the attention of students to the drawbacks of unethical use of it, and developing tools and strategies to detect AI content in scholarly papers. By doing so, they can ensure that the integration of AI technologies in academic writing supports, rather than undermines, the core principles of scholarly communication.

The findings of this study have several important implications for the academic community. The increase in the use of specific lexical items suggests that students are indeed using text generators, which is shown in the novice stylistic choices they make. This use can be seen as both beneficial



and concerning. On one hand, AI tools can enhance the quality of academic writing by promoting sophisticated vocabulary and clear, emphatic language. If used appropriately and reasonably, students can benefit from it to adequately scaffold their learning of generic conventions and stylistic choices relevant in the academic field. On the other hand, the homogenization of writing styles raises concerns about originality and authenticity.

Despite the potential benefits, the increased homogenization of writing styles is a significant concern. The recurrence of specific lexical items might lead to a lack of diversity in academic writing, reducing the originality and distinctiveness of individual theses. This could undermine the fundamental academic principle of originality, where each student's work should reflect their unique perspective, style, and voice. Additionally, the reliance on AI-generated content raises ethical questions about authorship and intellectual ownership. Educational institutions must address these concerns by developing guidelines and strategies to ensure responsible use of AI in academic writing.

One of the cornerstones of academic scholarship is the unique perspective and voice each researcher brings to their work. Originality is not merely a requirement for academic rigor but also a reflection of individual intellectual endeavors. The use of AI-generated content, with its tendency to favor certain lexical items and stylistic patterns, poses a risk to this individuality. When students and researchers rely heavily on AI tools, their work may begin to resemble that of others who use the same tools, leading to a convergence of writing styles that blurs the lines of personal expression. This could inhibit creativity and discourage students from developing their own scholarly voices, which are critical for the advancement of knowledge and the fostering of diverse intellectual landscapes.

The reliance on AI-generated content also raises significant ethical questions about authorship and intellectual ownership. Traditionally, academic work is a product of individual effort, reflecting the researcher's dedication, creativity, and critical thinking. However, when AI tools contribute significantly to the writing process, determining the true author of the work becomes complex. Who owns the intellectual property—the student who submitted the thesis or the developers of the AI tool that generated a substantial portion of the content? This blurring of authorship lines challenges the integrity of academic credentials and the value of a degree. Educational institutions must deal with these ethical dilemmas and develop clear policies to address the proper credit of AI-assisted work.

The increased use of AI in academic writing could also impact the standards and evaluation processes within educational institutions. If AI-generated content becomes the norm, evaluators may face difficulties in assessing the true capabilities and efforts of students. Standardized writing styles might make it harder to differentiate between high-quality, original work and content that has been heavily influenced or generated by AI tools. This could lead to a devaluation of academic assessments and qualifications, where grades and distinctions no longer accurately reflect a student's individual merit. To maintain academic integrity, institutions need to refine their evaluation criteria and incorporate mechanisms that can effectively distinguish between genuinely original work and AI-influenced submissions.

Given these concerns, educational institutions must develop guidelines and strategies to ensure the responsible use of AI in academic writing. These guidelines should emphasize the importance of originality and the ethical implications of AI-generated content. Future research should continue to explore the profound impact of Artificial Intelligence (AI) on academic writing across diverse genres and educational levels. AI tools, such as language models and automated writing assistants, are increasingly being integrated into educational settings, influencing not only the writing process but also the quality and style of academic output. Moreover, it is important to investigate how AI tools affect different disciplines within academia. For example, disciplines like humanities may see AI influence stylistic choices and rhetorical strategies differently compared to STEM fields, where precision and clarity are paramount (Melliti, 2024). Understanding these disciplinary variations can provide insights into how AI can be optimized for specific academic needs.

Another important area for research is examining whether AI-driven writing shows consistent patterns of lexical choice across disciplines and educational levels. Researchers can continue what this

paper has done and further assess whether AI tends to favor certain vocabulary or syntactic structures, potentially shaping the language used in scholarly communication by analyzing the output of AI-generated texts in various academic contexts. Developing robust frameworks for the ethical use of AI in education is essential to mitigate the concerns related to AI use in academia. This includes addressing issues such as plagiarism detection, authorship attribution, and ensuring that AI tools support rather than replace the development of students' writing skills.

## 8. Conclusion

The use of AI, particularly ChatGPT, has significantly influenced the recurrence of specific lexical items in MA theses. The findings of this paper suggest that AI-generated content is shaping the stylistic choices in academic writing, leading to a noticeable increase in the frequency of certain phrases and terms. While this has potential benefits, such as improved writing quality and reduced plagiarism, it also raises concerns about originality and authenticity. It is essential for the academic community to carefully consider these implications and develop strategies to integrate AI responsibly, ensuring that the integrity of scholarly work is preserved.

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