

An Analysis of Thematic Progression in the AI written Argumentative Paragraph

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Abstract

This research paper examines the thematic progression in AI-generated argumentative paragraphs, focusing on how artificial intelligence constructs and organizes ideas within text.

With the emergence of revolutionary artificially intelligent software and applications, every field has adopted a digitalized approach. The creative writing is not an exception in this regard as there are various tools that help writers in writing creative or academic texts. However, the originality and credibility of the writings made by AI applications is still in question. Coherence and cohesion are the most important elements when writing creative paragraphs or essays. The study aims to analyse various thematic structures, including constant theme, linear theme, and split rheme, to assess their prevalence and impact on coherence and clarity in AI-written content. Through qualitative paradigm, the research explores the instances of these thematic patterns in an argumentative paragraph written by ChatGPT on the topic "Is Gender Equality a Myth". The study uses content analysis method to explore logical connections, advancing arguments, and maintaining reader engagement in this paragraph. The findings highlight that the AI written text is highly coherent and employs all three types of thematic patterns exhibiting connectivity of ideas and achieving logical flow of information making the paragraph more dynamic and multilayered in its argumentative approach. This study provides insights into the potential for AI to assist in writing tasks while also underscoring the areas where further development is necessary for improved argumentative writing capabilities.

Keywords: Thematic Progression, Coherence, Digitalized approach, Logical flow, Argumentative writing

Introduction

Among most transformative technologies currently in development (Akram et al., 2021; 2022; Chen & Ramzan, 2024), the rise of Artificial Intelligence (AI) as a dominant technology in recent years has profoundly influenced various aspects of human life (Abdelrady & Akram, 2022; Ramzan et al., 2023). It is regarded as one of the most transformative technologies currently in development (Akram & Abdelrady, 2023; Ma et al., 2024). AI has found applications in diverse sectors, including medicine, engineering, journalism, and forensics. The term "Artificial Intelligence" was first coined by McCarthy in 1956 (Christiani, 2016), following the earlier work of Turing (Turing 1937, 1970). Turing (1970) defined AI as the development of intelligent reasoning and thinking within machines, capable of performing tasks that require human-like intelligence. Since its inception, the concept of AI has evolved with the rapid advancements in technology. According to Popenici & Kerr (2017), modern AI refers to computing systems that emulate human cognitive processes such as learning, adapting, self-correcting, and using data for complex tasks. Acemoglu & Restrepo (2019) describe AI as the study and development of software algorithms that interact dynamically with their environment. Despite variations in definitions, one thing remains clear: AI has significantly impacted human lives, especially in recent years.

AI's influence spans a wide range of industries, including manufacturing, transportation, architecture, design, the television and film industries, and the medical field. As Popenici & Kerr (2017) highlight, AI has the potential to revolutionize education by offering personalized learning experiences and intelligent tutoring systems. Boubker (2023) further elaborates that

AI stems from advancements in computing technology, enabling machines to perform tasks requiring advanced human intelligence, such as speech and visual recognition, natural language processing, and decision-making.

AI is inherently interdisciplinary, drawing from computing, engineering, cognitive science, philosophy, neuroscience, and economics (Zawacki-Richter et al., 2019). Although relatively young in the educational sector, AI has garnered increasing interest from academic, professional, and governmental bodies, particularly for its potential role in transforming education (Zawacki-Richter et al., 2019). Chiu et al. (2023) further emphasize that AI has made significant contributions to modern educational practices and classroom settings. Artificial Intelligence (AI) has made significant advancements in the field of education (Al-Adwan et al., 2021; Aslam et al., 2021), particularly with the introduction of generative AI technologies (Akram et al., 2021). As Ray (2023) explains, "Generative AI refers to the capability of online tools to generate new data based on previously observed patterns, as well as their ability to influence human cognitive processes." This means that generative AI tools, like ChatGPT and Google Bard, can analyse large datasets and produce synthesized information. Consequently, both educators and students are increasingly turning to generative AI, particularly ChatGPT, to access the information they need.

Research by Sundar & Liao (2023) and Hung & Chen (2023) has shown that ChatGPT has become a primary source of information for students. Anderson (2023) notes that ChatGPT, introduced in November 2022, was pre-trained on an extensive dataset of human-generated text and subsequently fine-tuned for specific tasks. As a result, ChatGPT excels at processing natural language, predicting the next word, and generating text that closely resembles human communication, as well as performing other language-related tasks such as dialogue. Thorp (2023) further highlights that ChatGPT functions as a communication tool, a role traditionally fulfilled by humans. Additionally, scholars have begun using ChatGPT to evaluate essay feedback and to assess academic performance.

Among the four fundamental language skills, writing holds a unique place as it allows individuals to articulate their thoughts in a structured manner that serves a clear purpose (Ramzan & Alahmadi, 2024; Ramzan et al., 2023). Blanchard and Root (1998: 1), as cited in Mundriyah and Parmawati (2016), emphasize that learning to write in a new language can be quite challenging. Furthermore, Apsari (2017) argues that writing is vital not only for professional growth but also for personal development, as the quality of one's writing reflects their cognitive abilities. A well-crafted job application letter, for instance, can make the difference between being hired or rejected. Therefore, strong writing skills are crucial to effectively communicate ideas and knowledge.

Faisal & Suwandita (2014) describe writing as a fundamental language skill, equally important as speaking, listening, and reading. In today's world, students must learn to write letters, reports, responses to advertisements, and increasingly, content for electronic media. Essentially, much of our recorded communication is in written form. Amperawaty (2019) defines writing as a process that involves planning, drafting, and revising. This process includes the exploration of ideas, the composition of an initial draft, subsequent revisions, and finally, the creation of a polished final draft. For second language learners, especially those in higher education, writing is undeniably an essential skill.

Thematic progression plays a crucial role in ensuring coherence in a text, making it essential for a well-structured piece of writing. This involves the use of theme and rheme, which form the core elements of a clause. Understanding thematic progression enables a better comprehension of the entire clause. According to Syharizal et al. (2018), thematic progression refers to how the topic of a clause is revisited or reiterated. This progression becomes clear when analysing the patterns of theme and rheme within a text. The exploration of theme and

rheme is rooted in systemic functional linguistics, which views language primarily through the lens of its core functions. Halliday (2004) identified four metafunctions of language: experiential, interpersonal, textual, and logical. Butt (2000) further explained that language fulfills three main roles: the experiential function, which conveys individual experiences; the logical function, which illustrates the relationships between ideas; and the interpersonal function, which allows for the expression of opinions. Moreover, language also serves a textual function, organizing these meanings—experiential, logical, and interpersonal—into a coherent structure.

1.1. Statement of the Problem

The growing reliance on Artificial Intelligence (AI) for generating written content, particularly in academic and argumentative writing, has raised important questions about the quality and coherence of AI-generated texts. One key aspect that contributes to the effectiveness of any written argument is thematic progression—the way in which ideas are developed, maintained, and transitioned throughout a text to ensure logical flow and coherence. While human writers are typically trained to maintain thematic consistency, it remains unclear how AI-generated texts handle thematic progression, especially in the context of argumentative writing where clear and logical development is crucial for persuasive communication. This research seeks to address the gap in understanding whether AI-written argumentative paragraphs follow established patterns of thematic progression or if they produce content that is fragmented and lacks coherence. Given the increasing use of AI tools for drafting academic and professional writing, there is a pressing need to evaluate whether these AI-generated paragraphs meet the necessary standards for logical and thematic consistency. Without a clear understanding of these dynamics, there is a risk that AI-generated argumentative texts could undermine the quality of academic discourse. Thus, this study aims to analyse and evaluate the thematic progression in AI-written argumentative paragraphs.

1.2. Significance of the Study

The increasing use of Artificial Intelligence (AI) in academic and professional writing has prompted a critical examination of how AI-generated texts align with established writing standards, particularly in terms of coherence and logical flow. This study, focusing on thematic progression in AI-written argumentative paragraphs, holds significant relevance for multiple stakeholders in education, technology, and communication.

First, for educators and academic institutions, the study provides insights into whether AI-generated content meets the rigorous standards of academic discourse. With AI tools being increasingly used by students, understanding their limitations in thematic progression can help educators guide learners on when and how to appropriately integrate AI in academic writing while maintaining coherence and logical argument development.

Second, for AI developers and researchers, this study offers valuable data on the performance of AI writing systems. Analysing thematic progression will reveal how well AI tools mimic human writing processes, especially in argumentative contexts where clear, connected ideas are crucial. Such insights can contribute to the development of more sophisticated algorithms that enhance the coherence of AI-generated texts.

Lastly, this research is also relevant for professionals who rely on AI tools for drafting reports, articles, or presentations. Understanding the strengths and weaknesses of AI-generated texts in thematic progression can inform better usage of these tools in workplace communication, ensuring that outputs are not only grammatically correct but also logically coherent and well-structured.

In sum, this study bridges a critical gap in the understanding of AI's role in writing, offering practical implications for improving AI-generated texts while informing best practices for their use in educational and professional contexts.

1.3. Research Objectives

1. To analyse the patterns of thematic progression in AI-generated argumentative paragraph
2. To assess the coherence and logical flow in AI-generated academic paragraph

1.4. Research Questions

1. What patterns of thematic progression are evident in AI-generated argumentative paragraphs?
2. To what extent do AI-generated texts exhibit coherence and logical flow in their thematic development?

Literature Review

This paper examines the use of thematic progression in student essays from a course preparing for MA studies in journalism, media, and communications, comparing it to the thematic progression found in two major British newspapers. It explores how assignment writing can generally be enhanced by teaching fundamental progression theory. To ensure that students' assignments are both coherent in their structure and engaging for the reader, developing additional progression techniques is necessary. The paper particularly recommends variations on Daneš' progression types, along with incorporating more thematic breaks (non-participant themes) to signal rhetorical shifts in the text. By analyzing thematic progression in both tabloids and broadsheets, students can gain a broader understanding of the spectrum of progression styles, ranging from formal to more expressive, which can raise their awareness of different possibilities—even though not all aspects may suit academic writing (Hawes, 2015).

The concept of thematic progression refers to how information flows within a text, ensuring coherence and clarity. Danes (1974) introduced different progression types, including simple linear, constant, and derived themes, which have been widely applied in text analysis (Hawes, 2015). When applied to AI-written texts, thematic progression helps evaluate the coherence and argumentative strength of paragraphs, as AI tools often rely on natural language generation models (e.g., GPT-3). However, there is limited research on how AI-generated texts maintain thematic coherence compared to human-written content.

Studies like Hawes (2015) explore how professionals and students use thematic progression, offering insights into the patterns that may emerge in AI writing. Further, advancements in AI writing tools highlight potential gaps in thematic structuring and progression when contrasted with human outputs (Ferrucci et al., 2010). AI's ability to handle rhetorical transitions and maintain reader engagement through progression theory remains under-researched, making it a crucial area for deeper study.

Danes (1974) laid the foundational work on thematic progression, describing the different types of theme-rheme structures that ensure textual coherence. Danes identified simple linear progression, constant progression, and derived themes as crucial mechanisms in organizing information in texts. His work remains a cornerstone in understanding how themes are developed in both spoken and written discourse.

Halliday and Matthiessen (2004) extended Danes' model through a functional linguistic framework, linking thematic progression with the larger notion of textual metafunction. They emphasized how thematic choices contribute to the overall meaning-making process in texts. Their work provides a theoretical background for analysing the effectiveness of thematic progression in AI-generated writing.

Fries (1995) focused on thematic progression in academic writing, analysing how students develop arguments across paragraphs. His findings suggest that a well-structured thematic progression is key to producing clear and coherent academic essays, a principle that could be crucial for analysing AI-generated argumentative texts.

Thompson (2014) investigated thematic progression in professional writing, examining how themes develop in professional genres, including journalism and legal writing. Thompson's work demonstrates that different genres may require different types of thematic structuring, offering a potential framework for comparing AI-written texts in various fields.

Hawes (2015) compared thematic progression in student and professional writing, emphasizing the differences in how progression is managed in both. His findings on professional writers' ability to maintain coherence through breaks in thematic progression could be highly relevant for examining how AI systems handle thematic transitions.

Ferrucci et al. (2010) presented an overview of IBM Watson's DeepQA project, highlighting the capabilities of AI in generating text through natural language processing (NLP). Although their focus was not directly on thematic progression, their work on AI's language-generation processes lays the groundwork for understanding how AI systems manage thematic coherence.

Mahlberg (2009) explored thematic progression in narrative texts using corpus linguistics. By analysing large text datasets, she identified recurrent thematic patterns and their role in creating narrative flow. Such methods could be applied to AI-generated texts to identify potential gaps or inconsistencies in thematic progression.

Jing and McAlister (2018) examined the differences between human-written and AI-generated texts, focusing on the rhetorical structures in argumentative essays. They found that AI-generated texts often lack subtle thematic shifts and rhetorical transitions, leading to less engaging and more mechanical arguments compared to human writing.

Lee et al. (2020) conducted a comparative study on thematic progression in human- and AI-written legal texts. Their findings suggest that AI texts often struggle with maintaining thematic coherence across longer passages, leading to fragmented arguments. This issue is particularly relevant in argumentative writing, where maintaining a cohesive structure is essential.

Perez and Bel-Enguix (2021) studied thematic development in AI-generated texts from various natural language models. Their research showed that while AI systems could follow simple thematic structures, they often failed to introduce thematic variety, resulting in repetitive and less dynamic text flow.

Methodology

1.5. Research Approach

The currently study uses a qualitative research paradigm to analyse the thematic progression patterns in the paragraph written by an artificial intelligence writing software called ChatGPT. The qualitative research approach is suitable for the study because the data is in the form of text and for highlighting the patterns of thematic progression, the researcher needs to read the clauses and sentences of the paragraph and identify the themes and rhemes in these clauses or sentences.

1.6. Theoretical Framework

The current study uses the theoretical framework of Halliday and Matthiessen (2004). This framework is basically founded on the model presented by Dane (1974) classifying the thematic progression into three distinct categories that were constant theme/reiteration theme pattern, linear theme/zigzag theme pattern, and multiple theme/split-rheme pattern.

a) Constant Theme

The constant theme or reiteration theme pattern is a cohesive device in discourse that involves repeating the same thematic element throughout a text or passage. This approach serves to reinforce the central idea, ensuring that the reader remains focused on a particular concept or argument. By maintaining a consistent theme, writers can enhance clarity and coherence, allowing the audience to easily follow the progression of thoughts. This pattern is particularly

effective in persuasive or argumentative writing, where emphasizing key points can significantly influence the reader's understanding and reception of the message.

b) Linear Theme

The linear theme, often referred to as the zigzag theme pattern, is characterized by a progression where the theme evolves through a sequence of related ideas or concepts. In this pattern, each thematic statement builds upon the previous one, creating a clear and logical flow of information. This approach allows the writer to guide the reader through a structured narrative or argument, making connections between different points more explicit. The zigzag pattern can enhance engagement by introducing variety while still maintaining coherence, making it especially useful in complex discussions or analyses.

c) Multiple theme/split rheme

The multiple theme, or split rheme pattern, involves introducing several themes at the beginning of a clause, which allows for a more complex and nuanced presentation of ideas. In this structure, multiple themes are elaborated upon in the subsequent rheme, providing depth and richness to the discourse. This pattern is particularly effective in academic and analytical writing, as it enables the exploration of interconnected concepts while maintaining clarity and coherence.

1.7. Sample

The text for the analysis is an argumentative paragraph on the topic “Is Gender Equality a Myth?”. As the researcher intends to analyse the thematic progression patterns in the argumentative texts produced by the artificial intelligence software named ChatGPT.

1.8. Research Method

The study uses the content analysis method for conducting the research. Content analysis is a method of research that aligns well with the qualitative research approach and as the data to be studied is in the form of clauses and sentences, the content analysis method suits the overall design of the study.

1.9. Research Procedure

The first step was to give a prompt to the software ChatGPT and this prompt was “Is Gender Equality a Myth?”. The rationale for giving this prompt is that it is a question statement and the writer has to take one stance to prove his claim. He has to choose whether he agrees with the topic or not. The software wrote a paragraph consisting of 246 words spanning around 9 sentences. The researcher then read the whole paragraph carefully and identified various thematic patterns.

2. Analysis and Discussion

The paragraph consists of nine sentences dispersed along 26 clauses.

The breakdown of sentences and clauses is as follows:

Sentence 1: Gender equality remains a highly contested issue, with some arguing that significant strides have been made, while others assert that true equality remains an unachievable myth.

Clauses:

Independent: "Gender equality remains a highly contested issue"

Dependent: "with some arguing that significant strides have been made"

Dependent: "while others assert"

Independent: "true equality remains an unachievable myth"

Sentence 2: On the surface, progress is evident—women have gained the right to vote, work in various sectors, and pursue education at the same levels as men.

Clauses:

Independent: "On the surface, progress is evident"

Independent (coordinate): "women have gained the right to vote"

Independent (coordinate): "work in various sectors"

Independent (coordinate): "pursue education at the same levels as men"

Sentence 3: Many countries have also implemented laws prohibiting gender-based discrimination, and more women are now seen in leadership roles in politics, business, and academia.

Clauses:

Independent: "Many countries have also implemented laws prohibiting gender-based discrimination"

Independent: "more women are now seen in leadership roles in politics, business, and academia"

Sentence 4: However, despite these advances, deep-rooted systemic inequalities still persist, particularly in areas such as the gender pay gap, workplace discrimination, and underrepresentation in leadership positions.

Clauses:

Independent Clause: "deep-rooted systemic inequalities still persist"

Dependent Clause (Phrase): "particularly in areas such as the gender pay gap, workplace discrimination, and underrepresentation in leadership positions"

Sentence 5: Women continue to earn less than men for the same roles, face glass ceilings in their careers, and often bear the burden of unpaid labor, such as childcare and housework. Cultural attitudes also reinforce traditional gender roles, limiting women's opportunities for professional advancement and autonomy.

Clauses:

Independent: "Women continue to earn less than men for the same roles"

Independent (coordinate): "face glass ceilings in their careers"

Independent (coordinate): "and often bear the burden of unpaid labor"

Dependent: "such as childcare and housework"

Sentence 6: Moreover, gender inequality becomes more pronounced when intersectionality is considered—women of color, LGBTQ+ women, and those from marginalized communities face compounded discrimination.

Clauses:

Independent: "Cultural attitudes also reinforce traditional gender roles"

Dependent: "limiting women's opportunities for professional advancement and autonomy"

Sentence 7: This reality suggests that while gender equality may be an idealistic goal, it is far from being fully realized in practice.

Clauses:

Independent: "gender inequality becomes more pronounced when intersectionality is considered"

Independent: "women of colour, LGBTQ+ women, and those from marginalized communities face compounded discrimination"

Sentence 8: To dismiss the notion of gender equality entirely as a myth would undermine the progress made, but to claim it has been fully achieved would ignore the systemic barriers still in place.

Clauses:

Independent: "This reality suggests that while gender equality may be an idealistic goal"

Independent: "it is far from being fully realized in practice"

Sentence 9: Therefore, gender equality, though not an absolute myth, remains a work in progress, requiring ongoing efforts to dismantle entrenched inequalities and challenge societal norms that perpetuate disparity.

Clauses:

Independent: "gender equality, though not an absolute myth, remains a work in progress"

Dependent: "requiring ongoing efforts to dismantle entrenched inequalities"

Dependent: "and challenge societal norms that perpetuate disparity"

Theme and Rheme Patterns in the Clauses

Theme 1	Rheme 1
Gender equality	remains a highly contested issue
Theme 2	Rheme 2
with some arguing	that significant strides have been made
Theme 3	Rheme 3
while others	assert that
Theme 4	Rheme 4
true equality	remains an unachievable myth
Theme 5	Rheme 5
On the surface, progress	is evident
Theme 6	Rheme 6

women

Theme 7

Work

Theme 8

pursue

Theme 9

Many countries

Theme 10

more women

Theme 11

deep-rooted systemic inequalities

Theme 12

particularly in areas

Theme 13

Women

Theme 14

face

Theme 15

and often bear

Theme 16

Cultural attitudes

Theme 17

limiting women's opportunities

Theme 18

gender inequality

Theme 19

women of colour

have gained the right to vote

Rheme 7

in various sectors

Rheme 8

education at the same levels as men

Rheme 9

have also implemented laws prohibiting gender-based discrimination

Rheme 10

are now seen in leadership roles in politics, business, and academia

Rheme 11

still persist

Rheme 12

such as the gender pay gap, workplace discrimination, and underrepresentation in leadership positions

Rheme 13

continue to earn less than men for the same roles

Rheme 14

glass ceilings in their careers

Rheme 15

the burden of unpaid labor such as childcare and housework

Rheme 16

also reinforce traditional gender roles

Rheme 17

for professional advancement and autonomy

Rheme 18

becomes more pronounced when intersectionality is considered

Rheme 19

LGBTQ+ women, and those from marginalized communities face compounded discrimination

Theme 20

This reality

Theme 21

gender equality

Theme 22

it

Theme 23

gender equality

Theme 24

requiring

Theme 25

and challenge

Theme 26

that

Rheme 20

suggests that while

Rheme 21

may be an idealistic goal

Rheme 22

is far from being fully realized in practice

Rheme 23

though not an absolute myth, remains a work in progress

Rheme 24

ongoing efforts to dismantle entrenched inequalities

Rheme 25

societal norms

Rheme 26

perpetuate disparity

2.1. Constant Theme/Reiteration Theme:

The analysis of the themes and rhemes shows that the Theme 1 “Gender Equality” is repeated as the theme 4, theme 21, and theme 23 and the theme 21 “it” has been used as reference of the theme 21 gender equality which shows the employment of constant theme. Similarly, the When a constant theme is used, it reflects a focused and cohesive argument where the writer continually returns to the main topic, ensuring clarity and a strong emphasis on that particular subject. This technique can show consistency and reinforcement of the main idea, guiding the reader through a unified argument without deviating from the central point.

2.2. Linear Theme/Zig-zag Theme:

In this structure, the rheme (the part of the sentence that provides new information) of one sentence becomes the theme of the next sentence. Alternatively, the rheme may split into different themes for subsequent sentences. This approach indicates a more complex and dynamic flow of ideas.

In the text, “gender-based discrimination” has been used in the rheme 10 and then it has been used in the theme 11 as “system inequalities” confirming the instance of the use of linear or zig-zag theme. Similarly, the rheme 15 “burden of unpaid labor such as childcare and housework” has been employed as the theme 16 with the words “cultural attitudes” thereby being the linear or zig-zag theme.

The use of linear theme reflects a progressive development of the argument, showing how the writer is expanding on different aspects of a topic or introducing new sub-points. It signals the writer's ability to handle multiple strands of reasoning and link them coherently.

2.3. Multiple theme/Split Rheme

The instance of multiple theme/split-rheme is employed in the rheme 18 as the components used in this rheme 18 is carried and used as the theme of the next clauses: theme 19, and theme

20. The word “intersectionality” in rheme 18 becomes “women of colour” as theme 19 and “this reality” as theme 20.

The use of multiple themes or split rheme in an argumentative paragraph can enhance the clarity and coherence of the argument by allowing the writer to present complex ideas more effectively.

Conclusion and Recommendations

The study aimed at identifying the thematic patterns in an argumentative piece of text written by the artificial intelligence software named ChatGPT. The current era is just like an adventurous ride due to its shift towards advanced and artificially intelligent software and applications. These applications have done wonders in all the fields of life and creative writing is not an exception. Writers can take ideas for writing on any topic either it is an argumentative text or it is an academic test. When it comes to writing, coherence is the challenge to attain as the use of cohesive devices sometimes confuses the writers. The study took help of the AI software ChatGPT to write an argumentative paragraph on the topic “Is Gender Equality a Myth”. This paragraph was then analysed using content analysis method from qualitative research paradigm for the instances of thematic patterns such as constant themes/reiteration themes, linear themes/zig-zag themes, and multiple themes or split rhemes.

The study found that all three types of thematic patterns were present in the text. The use of constant theme in an argumentative paragraph demonstrates a focused and cohesive approach to developing an argument. In this method, the same theme is consistently carried over from one sentence to the next, ensuring clarity and reinforcing the central idea throughout the paragraph. A linear theme shows that the argument is unfolding in a logical, step-by-step manner. Each idea builds upon the previous one, which helps the reader follow the progression of thought smoothly. By incorporating multiple themes, a writer can address different aspects of a topic simultaneously, helping to convey a more nuanced argument. This approach allows the exploration of interconnected ideas without oversimplifying the discussion. Split rheme can help emphasize multiple points within a single paragraph, ensuring that the reader understands the significance of each theme. This can guide the reader's attention and highlight the importance of various supporting arguments. In essence, constant theme emphasizes stability and cohesion, while multiple theme (or split rheme) demonstrates elaboration and the logical progression of ideas, making the paragraph more dynamic and multilayered in its argumentative approach.

The study ends with the recommendations to the future researchers about identifying these thematic patterns in the creative and academic texts written by the students or other AI writing applications.

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