



LANGUAGE ORGANIZATION THROUGH THEME–RHEME STRUCTURE AND DISCOURSE COHERENCE IN ACADEMIC TEXTS BY MECHANICAL ENGINEERING STUDENTS

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ABSTRACT

This study investigates language organization in academic texts by Mechanical Engineering students through the analysis of Theme–RHEME structures, focusing on how students structure their written discourse for coherence. Using a descriptive qualitative approach and content analysis grounded in Systemic Functional Linguistics (SFL), the study examines the clause-level theme types and progression patterns in conceptual papers written by first-semester students, applying Daneš's framework. The analysis shows that Unmarked Topical Themes dominate 57% of the clauses, followed by Textual Themes (19%) and Interpersonal Themes (10%). The constant theme progression pattern is the most prevalent (58%), with linear patterns in 31% of clauses and derived patterns in only 4%. These results suggest that students' academic writing reflects a stable yet rhetorically limited technical discourse. The findings offer theoretical insights for SFL research and practical implications for improving thematic-based academic writing instruction for vocational engineering students.

Keywords: *Language Organization, Theme–rHEME structure, SFL, Academic text, Mechanical engineering.*

1. INTRODUCTION

Language is extremely important in the academic world, not just as a communication tool, but also as a means of organizing, structuring, and transmitting knowledge in a methodical and directed manner (Hien & Phuong, 2023). However, academic language is distinct from daily language. Academic language necessitates a systematic format, logical reasoning, and respect to the traditions of each academic discipline (Crompton et al., 2024). Thus, linguistic competence is an essential component for pupils to acquire critical, analytical, and argumentative thinking skills (Siti Nuraeni Mitra et al., 2023). In line with this, Jaja (2024) underlines that academic language is an important tool for organizing

ideas methodically and making them acceptable in scientific communication, both oral and written.

In academic writing, clarity and precision in presenting ideas are critical prerequisites (Ida Royani & Sihombing, 2024). According to Alharbi (2023), scholarly works must be rational, systematic, objective, and accountable. Novak et al. (2023) adds that academic texts should represent rigorous processing of ideas through precise language structures, whereas Saha et al. (2023) argue that scientific concepts can only be effectively accepted if transmitted using language that adheres to academic norms.

Several studies have found that pupils continue to suffer linguistic issues

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when writing in academic settings (Revniuk & Bátyi, 2023). For example, identifies concerns such as the usage of subjectless phrases, unfinished clauses, and extended, inefficient sentences. Ardianto (2020) also highlights how many students struggle to present a strong logical relationship between claims and evidence in their arguments. Furthermore, Lian (2024) and Sutarma, Jendra, & Adnyana (2023) found that errors in spelling, diction, and sentence structure are still prevalent, reducing the intelligibility of scientific writing. Students' structural comprehension of phonology, morphology, syntax, and semantics is weak (Putri, Liyan, Simatupang, & Noviyanti, 2024). Other studies highlight the importance of lexical elements in the ideational metafunction (Azmi & Amzah, 2024) and the use of modality and evaluative lexis in the interpersonal metafunction (Syaifudin, 2024), all of which indicate that linguistic aspects in academic writing still require strengthening.

These linguistic issues are more apparent in the academic texts produced by vocational students, such as those in Mechanical Engineering (El Maamri, 2025). This is because they are more focused on mastering technical and practical fields, which leads to academic writing being somewhat neglected (Na et al., 2024). However, Mechanical Engineering students must produce various types of academic texts, such as workshop practice reports, industrial internship reports, documentation, research reports, and final projects, all of which demand precise information arrangement and idea coherence (Obah, 2024).

Theme-Rem analysis is one method used in Systemic Functional Linguistics (SFL) studies to better understand how writers organize information (Nagao, 2023). The Theme establishes the message's starting point within the sentence, but the Rema generates fresh information. The layout of Theme-Rem allows academics to understand how information flows and discourse

coherence develops (Fitriyadi & Wuryandani, 2021).

Several studies on Theme-Rem have been conducted. Amin (2021) studied thematic structure in short stories and found that the dominant theme was an unmarked topical theme, which serves as the message-building pattern in narrative texts. (Huseynli, 2024) study on scientific abstracts identified single themes, dual themes, tailing remas, and non-tailing remas as variations in thematic structure. Other studies have shown that Theme-Rem can depict rhetorical strategies, meaning representation patterns, and even aesthetic and ideological meanings in song lyrics and argumentative texts (Anjani, 2023).

Although numerous studies have focused on Theme-Rem, they typically focus on literary texts, cultural texts, media texts, or academic texts in linguistic disciplines. Less emphasis has been paid to how thematic structure works in technical academic texts, particularly those authored by vocational students like Mechanical Engineering, which are more information-dense, objective, and procedural (Rehman et al., 2025). Furthermore, some prior research merely identified the sorts of themes and their basic patterns, leaving the relationship between thematic structure and discourse coherence unexplored, particularly in the context of technical academic writing (Sari, 2020). The purpose of this study is to investigate how Theme-Rheme structures contribute to discourse coherence in academic papers written by Mechanical Engineering students (van der Wal et al., 2024).

2. METHODS

This study employs a descriptive qualitative technique with content analysis based on the Systemic Functional Linguistics (SFL) framework developed by Buyukkal (2025) and Adhitya & Novita (2021). This framework was chosen because it allows the researcher to investigate how information is introduced and evolved in clauses using the

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structure of Theme and Rema. The research data comprises of conceptual papers prepared by first-semester Mechanical Engineering Department students. Data selection was deliberate, taking into account the fact that the papers are written in Indonesian, feature explanatory details, and have paragraph forms that allow for thematic analysis (Chen et al., 2020).

All texts were translated to digital format and classified into clauses as the primary unit of analysis. Each clause was examined to establish its Theme and Rema, with the Theme divided into topical, interpersonal, and textual themes, and whether they were marked or not. The topic progression was analyzed using Phetsangkhad and Prakai (2022) patterns, including constant, linear, split, and derived patterns, to understand how pupils develop information across clauses. To ensure the analysis's consistency, annotations were subjected to intrarater checks, which involved re-coding a portion of the data, and interrater checks, which involved two linguistics specialists evaluating the consistency of the annotation results. This technique ensures that the identification of Theme and Rema, and thematic patterns is done consistently (Tran et al., 2024).

3. RESULTS AND DISCUSSION

The analysis of academic texts by first-semester Mechanical Engineering students reveals a generally constant theme

tendency, reflecting the features of beginner writers in the technical vocational setting. Out of 103 sentences examined, it was shown that students primarily used Unmarked Topical Themes, which are themes in the form of subjects or nominal phrases that occupy the first position in the clause. This type of theme featured in 57% of the clauses and was typically composed of technical notions such as occupational accidents, metal materials, drilling, workbench techniques, and so on (Suryani et al., 2024).

Another type of theme is the Textual Theme (19%), mostly consisting of conjunctions such as However, Furthermore, In the context of practice, or Thus. These textual themes function to logically connect information, as Halliday explains that the theme is the element that "gives the clause its character as a message." The presence of conjunctions shows that students understand the basic thematic function in organizing the flow of argumentation (Mukramah et al., 2023).

Meanwhile, Interpersonal Themes appeared in 10% of the data, particularly through references to experts, such as "According to Syafii et al. (2023) or Paludo and Montresor (2024)" explains that...". This finding is relevant to the research by Wirtz and Lovelock (2021), which shows that interpersonal themes function to affirm the relationship between the writer and the reader in presenting scientific information.

The complete distribution is shown in the following table:

Table 1. Distribution of Theme Types in Student Texts

Theme Type	Frequency	Percentage
Unmarked Topical Theme	59	57%
Marked Topical Theme	14	14%
Textual Theme	20	19%
Interpersonal Theme	10	10%
Total	103	100%

In addition to topic kinds, the study discovered three patterns of theme development: constant, linear, and derived

themes. The bulk of the students' paragraphs followed the consistent theme pattern (58%), in which the theme appears in multiple

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consecutive sentences and relates to the same issue. This style is consistent with the descriptive nature of technical writing. This is consistent with the findings of Nugraha

(2017), who discovered that topic organization in students' scientific texts tends to be basic and linear, particularly among rookie authors.

Table 2. Theme Development Patterns

Theme Pattern	Theme Pattern	Theme Pattern
<i>Constant Theme</i>	41	58%
<i>Linear Theme</i>	22	31%
<i>Split/Derived Theme</i>	4	4%
Others	6	7%

To clarify the thematic characteristics of mechanical engineering students, here is a representative example in an analysis table format:

Table 3. Theme–Rema Analysis of Mechanical Engineering Students' Texts

Clause	Theme	Theme Type	Rema
<i>Occupational accidents are an event...</i>	Occupational accidents	Unmarked Topical	<i>an event caused by the work process...</i>
<i>However, in practice, many issues...</i>	However	Textual	<i>in practice, many issues...</i>
<i>According to Irwan and Suyanto (2019), workbench is...</i>	According to Irwan and Suyanto (2019)	Interpersonal	<i>workbench is a basic activity...</i>
<i>In everyday life, the application of engineering...</i>	In everyday life	Marked Topical	<i>the application of engineering can be found...</i>

Discussion**Dominance of Topical Themes and Characteristics of Discourse in Mechanical Engineering Students' Academic Texts**

The prevalence of topical topics in students' writings demonstrates that technical academic writing often presents information in a direct, factual, and object-oriented manner. Topical themes, whether marked or unmarked, typically include technical phrases such as workplace accidents, metal materials, drilling, workbench procedures, or technological advancements. The use of such subjects is not merely a stylistic inclination, but also a feature of the

technical genre, in which physical phenomena or mechanical processes serve as the main points of information (Nabila Zayanti et al., 2023).

In the framework of Systemic Functional Linguistics (SFL), the dominance of topical themes aligns with the ideational metafunction, where language is used to construct representations of experience. Halliday and Matthiessen explain that topical themes function as a "point of entry" for readers to understand the discourse field, especially when the discourse contains technical information based on processes (Tanaka, 2023). Thus, Mechanical Engineering students intuitively follow

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the discourse patterns typical in their field: they start the clause with physical phenomena or technical concepts, then explain the mechanisms, consequences, or attributes in the Rema.

In line with this, Wirtz and Lovelock (2021) claims that themes in scientific literature serve not just as clause openers, but also as the focal point that governs how technical material is comprehended. In other words, the prevalence of topical topics in engineering students' writing demonstrates that they realize that scientific writing in technical subjects must emphasize term correctness, objectivity, and a clear focus on the issue.

This tendency is an excellent first step in the development of pupils' academic literacy. However, the preponderance of topical themes indicates that students' thematic diversity is still limited, since they have not yet extensively used interpersonal or textual themes as clause openers to enrich the rhetorical structure of paragraphs.

Textual Themes as a Marker of Discourse Coherence

Textual themes are vital for shaping information structure and sustaining clause coherence. However, Furthermore, Thus, Nonetheless, and In the context of practice are common motifs in students' texts. Textual themes demonstrate that pupils understand the fundamentals of information organization, notably how to connect prior concepts to the next (Zou et al., 2023).

In SFL, textual thematic elements function as markers of logical relationships. Halliday refers to them as "organizational resources" that help readers navigate the structure of

discourse. When students write, for example:

- *However, in practice...*
- *Furthermore, in the field of engineering...*
- *Thus, this discussion shows that...*

They are creating discourse transitions that allow readers to follow the argument flow in an orderly and coherent manner. Syartanti et al. (2020) found that textual themes serve as logical bridges that "guide the reader from one unit of meaning to the next" in narrative and expository texts. Similar findings have been reported in other scholarly writing evaluations, where students regularly use explicit cohesion devices to guarantee that paragraphs are logically connected.

In the context of Mechanical Engineering students' writing, the use of textual themes can be understood as a strategy to ensure that technical information, which is often dense and terminological, remains comprehensible and sequential for readers. This is a positive step in their academic literacy development. However, their usage patterns are still limited to basic conjunctions and have yet to include more complex discourse connectors such as argumentative markers, advanced comparison connectors, or multidimensional cause-and-effect relationships.

Interpersonal Themes and Early Academic Awareness

Interpersonal themes communicate the writer's attitude, posture, or relationship with the information delivered. Mechanical Engineering students frequently cite experts or scientific sources in their academic texts, using

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phrases like "According to Irwan and Sularso explains that...", or "According to the article in the Journal of Materials Science Indonesia (2020)...". The development of attribution in this thematic location indicates that students are learning to recognize the importance of scholarly authority in academic writing. By placing scientific sources as the theme, students indirectly assert that the information they are presenting is based on theoretical foundations, not merely personal opinions.

Although interpersonal themes only account for about 10% of the data, this figure is significant. At the early stages of academic literacy development, students' ability to include scholarly references as clause openers indicates that they are learning to create evidence-based arguments. In academic literacy studies, the capacity to apply such attribution methods is an important indicator of rhetorical maturity since it indicates epistemological care and the ability to place oneself within the academic community. This aligns with the view of Ananti et al. (2025), who emphasize that interpersonal themes not only serve as markers of sources but also as devices to frame the writer's epistemic position. In other words, when a writer chooses to open a clause with a specific attribution, they are determining their stance on the cited knowledge, whether they are following, affirming, or merely reporting it. Thus, interpersonal themes play an important role in shaping the writer-reader relationship and determining the objectivity and credibility of the discourse (Susanto et al., 2023).

In the SFL framework, this interpersonal role is linked to the interpersonal metafunction, which

encompasses the expression of attitudes, modality, evaluation, and social relationships within the text. However, based on the data from Mechanical Engineering students, the use of interpersonal themes is still limited to neutral declarative attributions. They have not yet fully utilized epistemic modality, such as expressions like "most likely...", "it can be assumed...", "it is still debated whether...", or evaluative expressions that reflect the writer's level of certainty and judgment about a particular idea. These types of constructions help enrich argumentative nuance and clarify the writer's position within academic discourse.

This shortcoming is understandable given the qualities of rookie writers, who tend to provide material descriptively rather than argumentatively. However, this finding indicates that students are in the early stages of building an authorial position or academic presence in their writing. Students can write more rhetorically strong texts and reflect a more developed scientific thought process by varying interpersonal topics, such as through the use of modality, critical evaluation, or the integration of arguments from multiple literatures (Arbain & Ramadani, 2020).

Theme Development Patterns and Coherence Quality

The Constant Theme Pattern, which accounts for 58% of the data in this study, shows how information flows and develops in the text, allowing the paragraph structure to form logically and coherently. In this pattern, the theme used in several consecutive clauses remains the same or refers to the same topic. For instance, in a series of clauses like "Workbench techniques are...", "Workbench. However, this pattern often

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makes the discourse feel repetitive and lacking rhetorical variation. In other words, while students are able to maintain topic continuity, they have not yet developed thematic flexibility to expand perspectives or refine the flow of arguments.

The second most common pattern is the Linear Theme Pattern (31%), where the Rema from the previous clause becomes the theme in the next clause. For example, "Many practice participants do not use PPE" followed by "This causes minor incidents...". The shift from new information (Rema) to the starting point of the next clause (Theme) indicates an explicit logical connection. Halliday explains that the linear pattern is one form of thematic progression that indicates the writer's ability to maintain information continuity through referential cohesion. The use of anaphoric pronouns such as "this," "this condition," or "this situation" strengthens the connections between clauses, making the paragraph more coherent and semantically connected (Rahmayanti et al., 2021).

However, more complex thematic progression patterns such as derived themes or split themes only appeared in a very small portion, around 4% of the total data. In the derived theme pattern, different themes emerge from a common overarching theme, while in the split theme pattern, a single theme is broken down into several aspects or subthemes, which are then developed separately. The limited occurrence of these patterns indicates that students are still at an early stage in academic literacy, so their ability to perform abstraction, categorization, or develop multi-perspective arguments is not yet fully developed.

According to Rosdiana et al. (2024), beginner academic writers frequently fail to construct paragraphs

with layered thematic patterns due to their limited ability to combine multi-level arguments. This study supports that viewpoint, as students focus on basic patterns that provide discourse stability but do not promote deeper argumentation exploration. Nonetheless, the presence of the linear pattern and a modest number of derived themes indicates that pupils have begun to develop the ability to connect ideas rationally, albeit they still require training to write more sophisticated, varied, and rhetorically mature academic paragraphs (Doz et al., 2024).

Distinctive Features of Academic Texts by Mechanical Engineering Students

Mechanical engineering students have a strong tendency to employ technical phrases clearly and simply in their writing. The usage of terminology such as feed rate, drill bit geometry, workbench precision, or thrust force is more than just a mention of terms; it becomes an intrinsic element of the discourse structure they create. The use of such words demonstrates that students are starting to assimilate the specialized language of the engineering world, which is precise, standardized, and object-oriented (Pollock et al., 2023).

From a linguistic standpoint, the explicit use of technical words serves as a sign of discourse identity, distinguishing technical writings from generic ones. These phrases are rarely paraphrased into normal language since each has a distinct technical meaning that cannot be changed without compromising scientific accuracy. Feed rate, for example, cannot be replaced by "kecepatan makan" (eating speed) without causing ambiguity (Gulnaz, 2020).

From a cognitive perspective, the use of technical terms indicates that

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students are at the early stages of mastering concepts. They recognize that these concepts are inseparable from discussions of technical phenomena. The explicit use of these terms serves as a strategy to “embed” the concepts in their academic memory and signal their ability to understand the physical objects being discussed, such as tools, materials, or operational parameters (Zarazaga-Peláez et al., 2024).

From the perspective of technical scientific writing, the presence of these terms reflects an orientation toward accuracy, clarity, and measurement. The world of engineering demands results that can be calculated, tested, and replicated, so technical terms function as tools to tether the text to empirical realities that can be measured (Goos et al., 2023).

Moreover, the use of explicit terminology also serves as a bridge between verbal explanations and technical processes in laboratories or workshops. For example, when students write the term *thrust force*, readers, especially other technical practitioners, immediately associate it with the physical phenomenon of the force exerted during the drilling process. This makes the text more efficient and directly focused on the core discussion, in line with the typical characteristics of technical fields that minimize ornamental language (Boonsuk, 2023).

Overall, students' explicit use of technical vocabulary indicates that they are learning the conventions of the technical discipline's language. Although the usage of these terms has not always been accompanied by in-depth analysis, the capacity to incorporate precise technical phrases indicates a shift toward more mature scientific writing writing

that places conceptual clarity at the heart of arguments and technical explanations.

4. CONCLUSION

Based on the findings, this study finds that thematic organization in Mechanical Engineering students' academic texts is dominated by Unmarked Topical Themes, indicating a strong focus on technical objects and processes. The most popular theme development pattern is the Constant Theme Pattern, which produces a consistent but less diverse information flow. The existence of Textual and Interpersonal Themes demonstrates fundamental competency in maintaining coherence and providing academic legitimacy, but this is not reinforced by the use of modality, evaluation, or more developed arguing methods.

Theoretically, these findings lend support to applied linguistic research, notably the use of Systemic Functional Linguistics (SFL) to comprehend the distinct aspects of vocational academic speech that differ from general academic literature. In practice, the findings of this study can be used to construct SFL-based academic writing instructional strategies to increase engineering students' thematic structure variety, discourse cohesiveness, and persuasive skills. Future research could include expanding the data across multiple engineering disciplines to enrich the findings on technical writing in other engineering fields.

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