

# DISCOURSE STRUCTURE IN STUDENTS' SCIENTIFIC WRITINGS

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## ABSTRACT

This research examined discourse structure composed by college students in their scientific writings, particularly the introduction sections. This research adapts Teun Van Dijk's notion which is called discourse structure encompassing superstructure and microstructure. The researcher collects 22 scientific writings and uses a qualitative approach. Through the analysis, this research reveals that based on the superstructure analysis, students have no homogeneous format in composing the introduction. Also, at the level of microstructure, it reveals the use of grammatical cohesion such as anaphoric reference, additive, adversative conjunctions, and constant topic theme. Based on the findings, they are more familiar with certain grammatical and lexical cohesion in writing.

*Keywords: Discourse Analysis, Discourse Structure, Microstructure, Superstructure*

## ABSTRAK

*Penelitian ini menganalisis struktur wacana yang dibuat oleh mahasiswa dalam artikel ilmiah mereka, khususnya bagian pendahuluan. Penelitian ini mengadopsi gagasan Teun Van Dijk yang disebut struktur wacana yang meliputi struktur supra dan struktur mikro. Peneliti mendapatkan 22 artikel ilmiah dan menggunakan pendekatan kualitatif. Berdasarkan analisis, penelitian ini mengungkapkan bahwa berdasarkan analisis struktur supra, mahasiswa tidak memiliki keseragaman format dalam menulis bagian pendahuluan. Pada tatatan struktur mikro, penelitian ini juga mengungkapkan penggunaan kohesi gramatikal seperti referensi anaforik, aditif, konjungsi adversatif, dan konstan tema topik. Berdasarkan temuan penelitian, mahasiswa lebih mengenal kohesi gramatikal dan leksikal tertentu dalam menulis.*

*Kata Kunci: Analisis Wacana, Struktur Mikro, Struktur Supra, Struktur Wacana*

## INTRODUCTION

At university, institutions oblige students to participate in final examinations carried out at the end of semester as one of the requirements to acquire a bachelor degree. Preceding the examination, college students are supervised to conduct research related to their study program and interest. This rule is in line with what has been announced in circular letter No. 152/E/T/2012 by The Directorate General of Higher Education. It is stated that compared to Malaysia, scientific publications in Indonesia are still low. Therefore, it is obliged for them to write scientific writings, instead, they have to be published in a scientific journal.

Nelson & Castelló (cited in Cabral, 2020) argued that academic writing has become a subject in some higher education institutions which aims to make<sup>1</sup> students familiar with

organization and structure designed for scientific paper. They added that academic writing is defined as composing a text using appropriate and formal dictions to share theories and research findings. Tillema (2012) argued that writing is one of the most important skills for educational success, but also one of the most complex skills to be mastered. Another argument came from Kellogg and Raulerson (cited in Vo, 2019) who said that being proficient in academic writing is crucial since it is one of the key measures of academic success.

Writing is discourse and it is in line with what Kridalaksana (2008) stated that discourse can be presented in a form of complete composition, paragraph, sentence, or words bringing complete thought. Van Dijk (cited in Renkema & Schubert, 2018) argued that the aim of discourse studies is to demonstrate relations between forms of discourse elements and their functions in communication. Furthermore, Van Dijk (Louwerse & Graesser, 2006) introduced the concept of discourse analysis framework encompassing three elements, they are macrostructure, superstructure, and microstructure.

Macrostructure, as cited in Renkema and Schubert (2018) is the global meaning of discourse which can be attributed in text. It is used to reveal topic or theme as discourse does not only focus on connections built between sentences, but also the general meaning. The second element, superstructure, deals with form. It is the framework which aims to present the structured content. The term *superstructure* can be illustrated by the example of a newspaper article in which headline, lead, the news article itself, and etc. are presented. Unlike macrostructure which demonstrates the global meaning, microstructure deals with the relations between sentences, such as words, phrases, clauses, and sentences. Van Dijk added that microstructure encompasses semantic and syntactic structures.

Microstructure organize interrelated phrases, clauses, and sentences of the text (Louwerse & Graesser, 2006). Each sentence has a deep structure interpreted by the semantic component of the grammar. Meanwhile syntactic transformations relate that deep structure to the surface structure of a sentence. Van Dijk added that text grammars have these deep and surface structure. Also, the most prominent thing of discourse is that the sentences are connected together which is so-called cohesion (Renkema & Schubert, 2018).

Halliday and Hasan as cited by them stated that there are five types of cohesion, they are: (1) substitution, (2) ellipsis, (3) reference, (4) conjunction, and (5) lexical cohesion. Substitution is the replacement of a word (group) or in other words it is a “dummy” word. It usually involves

three types, such as nominal, verbal, and clausal. Meanwhile, ellipsis is the omission of a word and it can be covered by another clause. Ellipsis and substitution are closely related and frequently called “substitution by zero”. Unlike them which deals with grammatical unit, reference deals with semantic relationship and relation between discourse element. The next type of cohesion is conjunction which is conceptualized as relationship indicating how sentence or clause are linked. It can be reached by the use of four frequently relationship, such as additive, adversative, causal, and temporal.

While the previous mentioned types deal with grammatical cohesion, lexical cohesion refers to the content words. Unlike grammatical cohesion which encompass four types, lexical cohesion can be distinguished by two types, they are reiteration and collocation. Renkema and Schubert (2018) added that reiteration involves repetition and synonymy, while collocation is the relationship between words in the same surroundings.

Another crucial element in discourse is coherence and Reinhart as cited in Wang and Guo (2014) argued that coherence is constructed by semantic and grammatical connectedness. It involves three elements, such as connectedness, consistency, and relevance. Connectedness means sentences are linked together in semantics and grammar, while consistency means no contradiction between propositions expressed, and relevance means the text should be relevant to its context and all are linked together to the general topic and this statement is in accordance with what Halliday (2004) conceptualized with theme and rheme. Theme is the element functioning as the point of a message, while rheme is the element developing the theme.

In accordance with this topic, the researcher finds out some relevant previous research. The first one was conducted by Numertayasa et al. (2013) analyzing macrostructure, superstructure, and microstructure of senior high school students’ essays in Rendang 2011. The result showed that the superstructure consisted of introduction, thesis statement, body, and conclusion, while active-passive voices, cohesion-coherence markers, pronouns, metaphors, and others were represented as microstructure, and the macrostructure was about global warming, the use of Indonesian, cyber realm, free education, etc. In other words, the senior high school students’ essay was well-structured.

Another relevant study was from Mureşan and Kic-Drgas (2019) entitled “An analysis of abstracts in medical and economics journals: microstructure and practical applications”. They examined the microstructure of 40 abstracts from prestigious impact factor medical and

economics journals and offered a guideline to write an abstract writing in foreign language courses. The results showed that there were varieties of microanalysis between economic and medical journals. The use of transition words appeared more often in economics journal as 85%, while in medical journals as 50%. The verbs and phrases used to show the results were also varied. The medical abstracts showed a larger variety of verbs and presented findings precisely than did the economics abstracts. The researchers also added some practical applications by offering a few guidelines for designing learning activities regarding ESP.

Regarding what have been conducted in previous research, this study focuses on discourse structure composed by college students in their scientific writings, particularly their introduction section. As explained above that students' publications are crucial according to The Directorate General of Higher Education and due to their proficiency in academic writing can determine their academic success, the research question is how discourse structure is built by college students in their scientific writings referring to superstructure and microstructure proposed by Teun Van Dijk.

## **METHODOLOGY**

This research is a qualitative research which based on Cresswell (2013) it is defined as an approach which functions to examine social problems and do not examine relation among variables. The researcher collects 22 students' scientific writings who graduated in 2020 and they were from English study program. The scope of the analysis is their introduction part in which micro and superstructure proposed by Teun Van Dijk are analyzed. The analysis techniques are as follows.

1. The analysis is done at the level of superstructure.
2. The framework or details written in introduction is scrutinized.
3. The classification is then carried out to find out the details inserted in introduction.
4. The last step is at the level of microstructure dealing with grammatical and lexical cohesion.
5. The classification is conducted to find the way they composed the introduction.

## RESULT AND DISCUSSION

### Superstructures

As it is conceptualized by Van Dijk, superstructure is the framework of structured content. The data reveal that the way students construct the introduction is in a different way. All of them, indeed, began with research background, but then there was only one student writing research question and research objective at the same time, followed by some previous studies. Others came up with research background, research objective, followed by recent research and sometimes continued by theoretical framework, and significance of the study. Those means there is no homogeneous composition, whereas the institution has already published a guideline for scientific article. In addition, to figure out the superstructure composed in students' introduction, it is illustrated as follows.

Table 1 Superstructure

| Research Background | Research Question | Research Objective | Previous Studies | Theoretical Framework | Significance of the Study |
|---------------------|-------------------|--------------------|------------------|-----------------------|---------------------------|
| 22                  | 4                 | 20                 | 22               | 11                    | 4                         |

### Microstructure

#### Grammatical Cohesion

All students used anaphoric reference to build their introduction and none of them used cataphoric. From two examples below, the referents lie within the text and the pronouns used refer back to the prior words. The way they construct the anaphoric are as follows.

- (1) ***Technology** has improved and evolved rapidly leading everything ahead. **It** compels everything around to adjust and improve themselves otherwise they will be left behind.*
- (2) *In the current era of globalization, **many countries** are connected to each other. However, **they** have different languages according to their own region.*

Meanwhile, almost all students did not use substitution and ellipsis in composing their writing and only some of them who do. The substitution and ellipsis they used were verbal

substitution and nominal ellipsis. The word *so* represented the activity in translating, whereas *both* indicated nominal ellipsis of *metaphor*. Here are the examples of theirs.

- (1) *A translation product can only be considered successful not only when the meaning can be translated, but also the ideas, thoughts, messages, and concepts that exist in the source language can be delivered into the target language. In order to do so, the translators need to have adequate knowledge of the cultures in both source and target language.*
- (2) *Metaphor has a very close relationship with simile. **Both** are part of figurative speech and grammatical forms that represent two proportions in the semantic area and have the same function; to make comparisons.*

Furthermore, conjunctions which mostly appeared in their introduction were additive conjunctions such as *and*, *furthermore*, and *moreover* and adversative conjunctions such as *but* and *however*. There were a few students using causal and temporal conjunctions such as *thus*, *as a result*, *so that*, and *then*. The use of those conjunctions are as follows.

- (1) *It compels everything around to adjust and improve themselves otherwise they will be left behind. Innovation, **furthermore**, has now become a global phenomenon that enhances all sectors of life.*
- (2) *Generally, a person may understand one mother language and one foreign language. **However**, there are more than one thousand languages spoken all over the world.*
- (3) *He **then** adds the dominant procedure applied in the short story is reproducing the same image in TL procedure.*

Even though there were some students using variation of conjunctions, there were still students who did not. They only used additive and adversative conjunctions such as *and* and *but*. Also, in some paragraphs, they did not use them at all so that their sentences were not linked well. Here are the examples of paragraphs they composed.

- (1) *Everyone watches movies these days. The movie is used as tools of communication that is intended to express ideas, feelings, experiences, and imagination on the*

*moving image. There are many elements contained in a movie, one of many various elements is subtitles. Subtitle is the written language that you are usually found in the movie. Gottlieb in Baker (2000) states that subtitles are transcriptions of film or TV dialogue presented simultaneously on the screen. Subtitles usually consist of one or two lines of an average maximum length of 35 characters.*

- (2) *This study is to provide insight about the leads. Because lead is the most important part in the news, it should convey the essence and facts of the story straight up. The lead establishes the direction of writing will take. It should state the who and the what in the first sentence. If the when, where and how are important, they should be stated, too. After reading the lead or introduction, the reader should know exactly what the article is all about. If the fact is not interesting or compelling enough, chances are that the reader won't go beyond the first paragraph. Good leads both tell and sell.*

To figure out how many students using the grammatical cohesion in their introduction of scientific writings, the result is illustrated as follows.

Table 2 Grammatical Cohesion

| Reference |            | Substitution |        |         | Ellipsis |        |         | Conjunction |             |        |          |
|-----------|------------|--------------|--------|---------|----------|--------|---------|-------------|-------------|--------|----------|
| Anaphoric | Cataphoric | Nominal      | Verbal | Clausal | Nominal  | Verbal | Clausal | Additive    | Adversative | Causal | Temporal |
| 22        | 0          | 0            | 1      | 0       | 2        | 2      | 0       | 22          | 22          | 11     | 4        |

### Lexical Cohesion

Different from grammatical cohesion, lexical cohesion sees repetition composed in writing. Based on the data, there were still students who did not use reference well. Instead of using it, they preferred using repetition to changing pronouns. The repetition which occurred in theirs are as follows.

*“Mass media of communication is communications that use medium or tool which can reach a lot of mass and a wide territory”. “Mass media communication will not separate by the mass, because in mass media communication, the delivery of the message is through the media”. Mass media consist of two main forms, namely electronic media and printed media.*

He did not paraphrase the information he cited so that the words *mass media* were used four times in a paragraph. This kind of repetition also appeared in another introduction. Instead of using the word *it*, he was consistent in using *translating novel*.

*Translating novel* is very different from translating scientific writing which is stick to the literal meaning. *Translating novel* challenge the translators to interpret the intention of the author and require reading the story in the source novel.

Likewise, as conceptualized by Halliday in preceding section that theme is the element functioning as the departure point of a message, while rheme is the element developing the theme. By using them, the data reveal the way students composed their introduction are as follows.

| Theme                        | Rheme   |
|------------------------------|---|
| This study →                 | is to provide insight about the leads.                        |
| Because lead ←               | is the most important part in the news,                       |
| it ↓                         | should convey the essence and facts of the story straight up. |
| The lead ↓                   | establishes the direction of writing will take.               |
| It ↓                         | should state the who and the what in the first sentence.      |
| If the when, where and how → | are important,  |
| they ←                       | should be stated, too.  |

As seen in the table, the point of departure of theme 2 up to 5 is still the same, however unfortunately the theme 6 does not show relevancy to the previous one, either the rheme or the theme, it comes up by bringing up another departure point. Another pattern of theme and rheme composed by the student is depicted as follows.

| Theme       | Rheme  |
|-------------|--|
| Everyone →  | watches movies these days.   |
| The movie ← | is used as tools of communication that is intended to express ideas, feelings, experiences, and imagination on the moving image. |



|           |   |  |
|-----------|---|--|
| Subtitle  | → | is the written language that you are usually found in the movie.                   |
| Subtitles | → | are transcriptions of film or TV dialogue presented simultaneously on the screen.  |
| Subtitles | → | usually consist of one or two lines of an average maximum length of 35 characters. |

Based on the table, the departure of rheme 1 is repeated into theme 2. Although the theme 3 up to 5 is similar, but suddenly theme 3 appears in which it has no relevancy to the previous theme or the rheme 2. Moreover, the use of similar themes for several times also can be illustrated in the following table.

| Theme  | Rheme   |
|--|---|
| Throughout the years, translation                        | has constantly been a vital phase of communication.   |
| In translation, human beings                             | cope with languages, words or texts and changing one language into another language.        |
| Discussing about translation, type of translation        | are discovered in printed media as well as in electronic media.                             |
| The type of translation in printed media                 | can be determined in imported books, manuals, recipes, and so on.                           |
| Those  | are then converted into the target language.  |
| Another type of translation which is in electronic media | can be found in imported films, universal news broadcasts, and foreign television programs. |
| Those voices and texts                                   | have been converted into the target language through dubbing or subtitling.                 |

According to the table, the departure theme 1 to 4 is relevant and there is also connectedness between rheme 4 to theme 5 and rheme 6 to theme 7. Relevancy among themes also portrayed in theme 5 to theme 6.

According to the findings, it reveals that students have different version in writing the introductions. Meanwhile, based on the findings at the level of microstructure, most of them chose anaphoric instead of cataphoric reference which means they were more familiar with them. Students' preference in using certain details can also be portrayed in the use of additive and adversative conjunctions which were used by all students. Meanwhile, the use of causal and

temporal conjunctions was only used by 11 and 4 students. The use of substitution which is only 1 verbal substitution, 2 nominal and 2 verbal ellipsis also show that they tend to use what they are able to in writing. Besides, in developing coherence, they are more able to repeat what previous themes has mentioned, instead of developing the rhemes. According to the previous study conducted by Numertayasa et al. (2013), students' essays were well-constructed. Unlike them, some college students' scientific writings presented in this study still need some improvement at the level of microstructure. It is in accordance with the research findings conducted by Mureşan and Kic-Drgas (2019) that the use of transition words appeared only 50% from prestigious impact factor medical abstract journals.

## CONCLUSION

In accordance with the research question, the discourse structure of students' scientific writings was built by using different format in composing the introductions or in other words, the superstructure was not homogeneous. Their introductions were also built by using certain grammatical and lexical cohesion only and developed with some repetitive words for several times. The last, most of them developed the paragraphs using constant topic theme instead of developing what rhemes have provided. Unfortunately, there are some of them jumping the idea so that the flow is not well-structured. Therefore, these findings are with regard to implications for English writing curricula so that students will be exposed more in those details.

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