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Cognitive Process By Students' Majoring in Natural and Social Science in Writing Analytical Exposition Text

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Diterima September 2020; Disetujui Oktober 2020; Dipublikasikan Desember 2020

ABSTRACT

This study deals with the cognitive process by students' majoring in natural and social science in Writing Analytical Exposition Text. This study attempted to investigate the reasons why the cognitive process happens in writing analytical exposition text the way it does. The data in this study were the students of SMA Nurul Iman from two different majors; they were three students of Natural Science Major and three students of Social Science Major. This study was conducted by using qualitative design of which instrument are both writing test and interview. The research findings show that the cognitive processes of the students of the two majors were different in planning, translating and reviewing. The students majoring in natural and social science write analytical exposition in similarity and different cognitive process. The similarity is that both students majoring write analytical text in terms three stages; planning, translating, and reviewing, and the different are that the two major student perform cognitive process in different stage. The students majoring in Natural Science use the information in the assignment to generate new information then relate it with their experience and they know about the topic to be developed. Whereas, students majoring in Social Science do not really know about the topic and do not relate it with their experience so that way they could not generate content information and develop the text.

Keywords: *Cognitive Process, Analytical, Different Major, Social Science, Natural Sciences*

How to Cite: Putri, Rinda Sari (2021). Cognitive Process By Students' Majoring in Natural and Social Science in Writing Analytical Exposition Text. *Jurnal Linguistik Terapan Pascasarjana Unimed*, 17 (3): 1-11

ISSN: 2407 - 7410

INTRODUCTION

English has become an important language in the age of globalization. It is medium of communication among people throughout the world. In Indonesia, students learn English as a foreign

language (EFL). They are taught four skills of English: listening, reading, speaking, and writing. Of all the four skills, writing has become more important in the era of Teaching English as a Foreign Language (TEFL). Writing as one of the language skill must be taught in English classes especially Senior High School Students. Through the teaching and learning of writing the students are expected to be able to produce a text well. This is in line with the objective of writing instruction in Senior High School, to develop the students' writing skill in order they can write into English effectively and accurately.

At the level of Senior High School, generally it has two majors, Natural Science major (IPA) and Social Science major (IPS). The students of the two majors have different cognitive process in doing something. Cognitive Process is something happening in the students' mind. The cognitive abilities of the Natural Science (IPA) students are different with Social Science (IPS) student. However, it is caused of the different way of their cognitive process of processing something. The ways they express their ideas is not similar and depend on their characteristics.

Actually, the students of Natural Science (IPA) major have such a way of thinking because their activities during learning in the classroom are engaging in investigations and activities that would allow them to develop deep conceptual understandings of scientific ideas and of the process of inquiry. They also read the work of others as their progress through an investigation to help them make sense of their own findings. In addition, because investigation is generally complex, the students of Natural Science often act like scientist; must record data points, observations, and initial analysis in writing. It is reflected through their activity in the laboratory, doing experiments and other subjects that required them to think critically. Most of IPA students use the left brain. Because in studying science, they will study logic, count, sequence, and analyze. Many people think they are serious, hard to play with, hard to socialize and quite. They are accustomed to reasoning, solving problem, tinkering with numbers and counting them. Not just fixated with the formula. They can find a new formula that is easier for them, if they are able to develop its basic nature.

Meanwhile, the IPS students, they prefer to use the right brain. Because in learning IPS, the use creativity more. And look at the outside world. They cannot just study books. They also must be active in society. Therefore, they are judged to be active, talking, sociable, and broader in their insights. Many people think they are stubborn. Actually they are not suborned; it's just that they are less serious about facing something. But in society, they are more sought after. Because they are easy to socialize.

Scharfersmen in Synder and Mark (2014) states that students who study in Social Science major are accustomed to explain something based on social phenomenon. It is in line with Stenberg in Zabu (2014) that proposed the students who study in Social Science major tend to memorize and recall information. Related to the learning style, Stenberg in Zabu (2014) also categorized students who study in social major into liberal. In this category, they like surpassing rules and procedures and attempt to

maximize changes. In addition, they also seek or are at least comfortable with ambiguous situations, and accept to certain degree unfamiliarity in life and work.

The students of Social Science (IPS) major have such a way of thinking because their activities or the subjects during learning in the classroom are engaging them in memorizing and arguing toward the social phenomenon that existing in the social life. They also consider of others' opinion or ideas as they progress through a discussion and they respect the differences as it is accepted by the society. The students of Social Science act like politician who generally good in arguing in spoken and therefore want to communicate their ideas to other people directly. Finally, students of social studies programs construct a knowledge base and attitudes from academic disciplines as specialized ways of viewing reality. They begin from a specific perspective and apply unique processes for knowing to the study of reality.

The ability to comprehend arguments is a fundamental aspect of human decision making and social interaction. It is also an ability that we expect the educational system to impact to students during their schooling. There is a national expectation that students become able to comprehend and think critically within a domain. On the other hand, Analytical Exposition text is kind of text in which the process of making what writers or speakers think clear to themselves and to others are organized systematically. As proposed by Nippold, Ward-Lonergen, & Fanning in Chase (2011), Analytical Exposition text requires the writer to embrace a particular point of view and try to convince the readers in order to have the same perspective. The writers also have to arise the problems and attempt to map language onto his or her own thoughts and feelings as well as the expectations of the reader. As the previous research conducted by Eka Maria (2016) state that cognitive process of the students in translating simple sentence of a paragraph in science, and also the reseach by Halpen (2004) about the cognitive process taxonomy based on the sex differences, the writer is interested to do a research based on SMA majors, the students of Natural Science major (IPA) and Social Science (IPS) in writing Analytical Exposition text. It is assumed that the students from both the two majors have their own way in expressing their ideas in Analytical Exposition text as the students from the two majors have their own characteristics. Their cognitive process will be reflected in their Analytical Exposition text and at least, we should realize that every student has same opportunity and no major is better than another major.

The problems of this study was stated in the following questions; How do cognitive processes occur in writing analytical exposition text by students' majoring in natural and social sciences?

This study was aimed at studying the new phenomenon on the cognitive process of the students in writing analytical exposition text. It specially attempts to explain objectively the cognitive process of the students in writing analytical exposition text as well as the reasons of doing such way. Thus, the objectives of this study was; to investigate cognitive processes applied by students' majoring in natural and social science in writing analytical exposition text.

The scope of this study is limited to the cognitive processes which are involves the 3 mainly aspects namely; planning, translating, and reviewing.

RESEARCH METHOD

This study was in descriptive qualitative design. This research described the cognitive process of SMA students in writing analytical exposition text viewed from the two different majors., IPA (Natural Science) and IPS (Social Science) majors. Thus, the result of the research was a description of the cognitive process of SMA students in writing analytical exposition text related with the different majors. Moreover, this research also explained the reasons why does the process happened the way it was in the process of writing analytical exposition text in the students' mind of IPA (National Science) and IPS (National Science). Thus, the result of the research was the elaboration of the reasons of the cognitive process of SMA students in writing analytical exposition text related with the different majors.

The data of the research were the text that were written by the students. The data source of the research was the students of SMA YP. NURUL IMAN in the second year class of IPA (Natural Science Major) and IPS (Social Science major). The reason for choosing of SMA YP. NURUL IMAN was based on observation that was done by the researcher at SMA YP. NURUL IMAN.

Cognitive Process by Students Majoring in Natural Science in Planning

| Subject/ Variable | NP | NR | NH |
|----------------------|--|---|---|
| Substance Topic | <i>Yang pertama saya lakukan adalah membuat kerangka tulisan bu Saya mikirkan setiap paragraf pikiran-pikiran yang dijelaskan dalam tulisan tersebut. (Data 1a)</i> <i>Yang saya pikirkan tentang UN ini menyangkut diri kita juga kan bu.(Data 1b)</i> | <i>Pertama kali saya pikirkan adalah kesulitan pada permasalahan topik yang saya ambil.2a)</i> <i>Pikiran tentang apa saja ide yang muncul di kepala saya yang ingin saya tuangkan kedalam tulisan ini. (Data 2a)</i> <i>yang saya pikirkan saat itu adalah untuk mempersiapkan bahasa yang jelas dan tenses yang bagus.(data 2b)</i> | <i>Ya itu bu, mengganggu sekali orang yang merokok di tempat umum itu. Kalo pun dia saja yang merokok yang lain juga jadi perokok pasif. Jadi pemerintah perlulah buat aturan larangan merokok di tempat umum bu. (Data 3a)</i> <i>Walau pun mereka diam saja hu tapi asap rokok mereka mengganggu dan membahayakan orang lain. Kan lebih bahaya lagi asap mereka itu bagi perokok pasif bu. Asap rokok itu mengandung nikotin dan tar yang merupakan racun bagi yang menghisap asapnya. (Data 3b)</i> |

From the matrix displayed above, it is seen that subject NP and NR think about the substance (topic) to be developed and consider to the readers of their analytical writing. Meanwhile, NH did not

think about the substance (topic) but she consider to the readers and how to make them interest to her writing by supporting with the interesting reasons.

Cognitive Process by Students Majoring in Natural Science in Translating

| Subject | NP | NH | NR |
|---------------|----|---|--|
| Transcription | | <p><i>Maksudnya bagi yang perokok berat itu harus berusaha untuk tidak lagi merokok. Walau mungkin tidak bisa langsung tapi bisa dikurangi tiap hari berapa rokok yang dia hisap,</i></p> <p><i>Maksudnya saya setuju sekali dengan adanya misal pemerintah membuat peraturan dilarang merokok di tempat umum gitu bu. Tidak cukup hanya larangan saja tetapi ada denda yang harus dibayar siapa yang melanggar dan di tempat- tempat umum juga dibuat slogan- slogan agar tidak merokok juga</i></p> | <p><i>Maksudnya di internet kita bisa misalnya melihat langsung reaksi kimia bagaimana ketika dicampur dan bagaimana reaksinya. Jadi lebih mudah melihatnya dari pada di lihat di buku saja dan hanya gambar.</i></p> <p><i>Saya mau memperlihatkan perbedaan kalo di pustaka dan Lewat internet bagaimana. Sehingga pembaca bisa melihat mana yang lebih efektif.</i></p> |

From the matrix displayed above, it is seen that subject NR and NH did translating during writing analytical text. Subject NR and NH generated their ideas from Indonesian language and translate it into target language while the subjects NP did not do translating during writing analytical exposition text. Subject NR and NH tried to create a cohesive and coherence writing by considering the more correspondence word.

Cognitive Process by Students Majoring in Natural Science in Translating

| Subject/V ariable | NH | NP | NR |
|----------------------|---|--|--|
| Reread the text | <p><i>Ketika saya sudah siap menulis teks ini, saya baca ulang lagi bu, apa adu yang salah dan mau ditambahi. Saya mengumpamakan saya sebagai pembaca. Kalo ibu yang membaca nanti bisa mengerti maksud dan penjelasan saya. Kalo menulis yang serius saya biasa menulis di kertas lain dulu bu, nanti kalo saya periksa ada yang salah kan mudah diganti lagi.</i></p> | <p><i>Saya membaca lagi dari awal apa udah nyambung atau masih ada yang salah biar hasil akhirnya bagus bu</i></p> | <p><i>Saya menulis di kertas lain dulu bu. Terus saya baca lagi dan setelah siap baru saya tulis lagi ke kertas untuk tulisan yang sebenarnya biar gak banyak coret- coretnya.</i></p> |

| | | | |
|-----------|------------|---|--|
| | | <i>Setelah siap saya periksa dan sudah pas baru saya pindahkan ke kertas yang sebenarnya bu</i> | |
| Edit text | <i>the</i> | <i>Ditulis itu sudah dibuat alasan-alasan dari topik yang dipilih dan sudah benar rasanya tensesnya bu.</i> | <i>Kalo misalnya dibaca lagi ada terasa janggal kalimatnya atau tensesnya salah jadinya diganti dengan kata yang sama maknanya dan sesuai tensesnya.</i> |
| | | | <i>Siap kalo sudah membuat alasan-alasan dari ide-ide yang dikembangkan.</i> |

From the table displayed above, it is seen that subject NH, NP, NH did reading and editing toward their analytical writing. They consider how to create a good writing and tried to diminish their mistake in their writing by rereading and editing when they found a mistake or errors.

The Cognitive Process of Students Majoring in Social Science

The of Students Majoring in Social Science do not do planning before writing their analytical exposition text even though they have different cognitive processes. The subjects' cognitive processes in planning stage are not develop and stuck in the transferring the ideas from Indonesian language into English language. It is reflected in their analytical writing which contains only a short paragraph.

Cognitive Process by Students Majoring in Social Science in Translating

| Subject | MJ |
|-----------------|---|
| Text generation | <i>Akan jadi mudah mengerjakan tugas bu kalo dengan adanya internet. Lebih detail dan lebih cepat mencari informasi lewat internet dari pada ke pustaka</i> |
| Transcription | <i>Saya buat dulu bu bahasa Indonesianya di buku lain baru saya cari terjemahannya ke bahasa Inggris.</i> |

From the data presented above it is seen that the subject MJ do translating during writing her analytical text The subject's cognitive process in translating stage are indicated by her efforts in finding the correspond words to the target language.

The Cognitive Process by students' majoring in Social Science in Reviewing

The students' majoring in Social Science do not do reviewing after writing their analytical exposition text. Reviewing in this writing includes reread and revised what they have written before. From their analytical writing it is seen that subject KB, MJ, and TR did not do rereading and editing toward their analytical writing. They argued that they did not have enough time and could not think how to make their analytical writing better.

The findings of this research are presented in the table form. The table includes the columns for the subjects' major, text, cognitive process in writing and cognitive process used.

| Subjects Major | Type of Text | Cognitive Process in Writing | | |
|--------------------|----------------------------------|---|--|--|
| | | Planning | Translating | Reviewing |
| Natural Science | Analytical Exposition Text | The students did planning before writing. Gathering ideas, organizing and put down their ideas | Less in translating in order to get the meaning | The students read and edit their text which has been written down in order to evaluate them. |
| Social Science | | Students did not do planning before writing. In gathering their ideas or organize the ideas, they seemed do not have an effort. | More ofeten in translating in order to get the meaning | Student did not review in order to evaluate their written text. |

FINDINGS AND DISCUSSIONS

Findings

Cognitive process in writing is the act or process of knowing in the broadest sense; specifically an intellectual process by which knowledge is gained from perception or ideas. During the writing, there are some mental process taking place in the students' mind, they are (1) Planning (2) Translating and (3) Reviewing, (Flower & Hayes in Saito, 2010). Dealing with the theory, it was also found that while writing an analytical exposition text, cognitive process of the students occurs in the three stages, namely planning, translating and reviewing. The cognitive processes of the students of the two majors were different in planning, translating and reviewing.

As stated that writing is a difficult skill for students due to the process of writing itself which is influenced by cognitive activities, Van den berg and Rijlaarsdam (2006) propose that there are several factors which affect the process of writing, they are: 1) Cognitive Activities of the Writers and 2) Topic Knowledge of the Writer.

Dealing with the theory of cognitive activities of the writers that mention the process of writing is influenced by cognitive activities, the differences between writers are related to differences in text quality. It was also found that students majoring in Natural Science are different from students majoring in Social Science in writing analytical exposition text. The differences are in temporal organization of other activities during writing. In other words, the relation between reading the assignment and 'generating' also different between the students of the majors. For some students majoring in Natural Science there is a positive relation between 'reading the assignment and generating while for students majoring in Social Science the relation between these two activities is negative or they did not follow the temporal organization.

Furthermore, the theory that explained the process of writing is influenced by topic knowledge of a writer and varying one another, it was also found from the students of the two majors. The students majoring in Natural Science use the information in the assignment to generate new information then relate it with their experience and they know about the topic to be developed. Whereas, students majoring in Social Science do not really know about the topic and do not relate it with their experience so that way they could not generate content information and develop the text.

Discussion

The findings are;

- (1) The students majoring in natural and social science write analytical exposition in similarity and different cognitive process.
- (2) The similarity is that both students majoring write analytical text in terms three stages; planning, translating, and reviewing.
- (3) The different are that the two major student perform cognitive process in different stage.
- (4) The new finding is the students majoring in Natural Science use the information in the assignment to generate new information then relate it with their experience and they know about the topic to be developed. Whereas, students majoring in Social Science do not really know about the topic and do not relate it with their experience so that way they could not generate content information and develop the text.
- (5) The limitation: the number of the data source.

CONCLUSION

The students majoring in natural and social science write analytical exposition in similarity and different cognitive process. The similarity is that both students majoring write analytical text in terms three stages; planning, translating, and reviewing. The students majoring in Natural Science use the information in the assignment to generate new information then relate it with their experience and they know about the topic to be developed. Whereas, students majoring in Social Science do not really know about the topic and do not relate it with their experience so that way they could not generate content information and develop the text.

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