

LEXICAL AMBIGUITY IN ENGLISH TEXTBOOK : A SEMANTIC ARTICLE

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Abstract

The aim of this research is to explain the how lexical ambiguity implemented in student English textbook. It focuses on the types of Lexical ambiguity by Ullman Stephen, there are Polysemy, Homonymy, Homograph, and Homophones. The methodology used qualitative research with content analysis as the approach. The data of this research are the word that consist of lexical ambiguity. The steps of collecting data were read and understand the textbook which is written as reading comprehension. then find the words that have multiple meaning that consist of lexical ambiguity, Then categorize the data into the table, and make code in each category. The procedure of analyzing data had done by three step, they are organizing and familiarizing, coding and reducing, and interpreting and representing. the article finding showed that two types of Lexical ambiguity were found in this textbook. there are Polysemy, and Homonymy, which is 14 data consist of Polysemy, and 11 data that consist of Homonymy. Refer to the results of the article, it can conclude that every word that have multiple meaning it consist of lexical ambiguity

Keywords : Semantic, Lexical Ambiguity, Textbook

INTRODUCTION

Ambiguity is one part of linguistics, namely semantics. Semantics is the study of the meaning of words, phrases, and sentences. Linguistic semantics associated with the conventional meaning conveyed by the use of words, phrases, and sentences of a language. In linguistics usually interpret the term narrowly, noting studies aspects of meaning encoded in linguistic expressions and does not depend on its use in a particular speech community. In other words, semantics is the study of meaning abstracted from aspects derived from the intent of speakers, psychological state, and socio-cultural aspects of the context. This is the same as what was stated by Griffiths (2006:15) "Semantics is the study of word meaning, and sentence meaning, abstracted away from contexts of use, is a descriptive subject". The theory means that Semantics is the study of the meaning of words or sentences according to the context of their use. Saeed (1997:3) also has the same opinion as Griffiths, he said that "Semantics is the study of meaning of words and sentences or semantic is the study of meaning communicated through language" and it means that semantics is the study of the meaning of words and also the meaning of language.

Ambiguity is a sentence where a word, phrase, or sentence has one or more meaning. Ambiguity is a condition in which each linguistic form has two or more interpretations. According to Ullmann (2009:8) "Ambiguity is a linguistic condition which can arise in a variety of ways." This agrees with the previous statement that, the notion of ambiguity is a linguistic condition that has more than one meaning, this is caused by words, phrases or sentences whose intent or meaning has one or more meanings. There are many ambiguous words or sentences are often found in written language, such as in newspapers, magazines, advertisements, or even in textbooks. And in this research the researcher will analyzing textbook. Textbooks are an important component in teaching and learning process. Textbooks are used generally as a resource for teachers to teach and students to learn. Teachers often use textbooks as the main teaching material in order to

teach well. even so there are many sentences which cannot be understood by students, so that it causes ambiguity.

However, ambiguity is divided into two types, there are Lexical ambiguity and structural ambiguity. But, according to Ullmann (1977: 128) ambiguity is divided into three types, namely; phonological ambiguity, structural ambiguity, and lexical ambiguity. Phonological ambiguity is an ambiguity in the level of phonology arises from the sound of language uttered not in written form. So, it can happen because the sound can be interpreted in more than one way. Sometimes people speak too fast, which makes other people listening to doubt the meaning or message of the person speaking. And, it can make the listener interpret with a different meaning or not in accordance with what the speaker meant. The second types is Lexical ambiguity, different with Phonological ambiguity, because it is observes the language in the level of the word. According to (Ullmann, 1977, p. 156) he said that Lexical ambiguity is the word that may have two or more different meanings its into a given context but the form is the same, and two or more different words may be identical in sounds.(Ramadani, 2015:2) also said that Lexical ambiguity happens when the words more than one Lexical meaning based on dictionaries. And the last type is Structural ambiguity. Hurford and Heasley (1984:128) state that sentence which is ambiguous because its words related to each other in different ways, even though none of individual words are ambiguous, is structural ambiguous. Therefore, in this research the researcher only focused in Lexical ambiguity. And the object of this research is textbook. Textbooks have an important role in the learning process, especially for learning a foreign language. Textbooks are used as media in teaching and learning in schools. In addition, the quality of textbooks depends on several factors such as appearance and clarity. What is meant by the appearance and clarity is a way of making material, for example using a picture or diagram to supporting material, whereas clarity demonstrate a clear sense of the material, especially the meaning of the text or sentence. Therefore, teachers should consider choosing textbooks because teachers play a role in explaining the material in detail to students and later students can easily learn and master the material, especially reading texts. However, not all teachers are able to explain the contents of the text or phrase in the book. Usually there are many sentences which, if translated into the Indonesian will have a different meaning in the true sense. So it will be difficult for students to understand because it refers to ambiguous sentences or words. And researchers have found several previous studies related to this research.

The reason why researcher take textbook as research objects is, firstly, ambiguity analysis research is rarely done, this is taken from the analysis of previous studies that have been read, there are many researchers who take newspaper objects, movies, and articles, but it is very rare for researchers to take textbook as research objects in ambiguity analysis. The second reason is to make it easier for students or to make students understand the material when reading textbook, because as we know that English has many words which when translated it will have a double meaning. So that it will make students feel confused. And the reason why researcher take reading skill as an object of research is because in the reading skill there are sentences or even words are ambiguous. Based on the explanations above, this article aimed to explain ambiguity. This article analyzing Lexical ambiguity that found in the English Textbooks of the Twelve grade high school students.

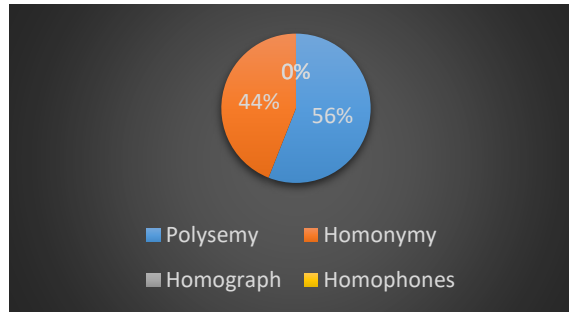
METHOD

In this article, the researcher focused on analyzing lexical in Skill Reading in the textbook entitled “Buku Bahasa Inggris Kelas XII SMA/SMK/MA/MAK.” The researcher used qualitative research. Cresswell (2009:4) state the qualitative research is fundamentally interpretive. It means that the researcher can make interpretation the data. It includes developing of an individual or setting, analyzing the data and then making an interpretation about its meaning personally, and theoretically Here, the author uses content analysis as a qualitative article approach. In addition, content analysis is easy to imitate and unobtrusive, meaning that the presence of the observer does not affect what is observed. Here, the author's role in this article is as a complete observer because this article focuses on Lexical ambiguity in English Textbook. So, the author worked on this article starting from collecting, analyzing, interpreting and representing the data from completing this article. The author chose Textbook as the object of the article because according to him the textbook is the best choice considering the COVID-19 pandemic that is endemic in Indonesia. The following sources of data in this article are words in Textbooks that have Reading Comprehension, which means two or more words. The data for this article are words found in the textbook entitled "Buku Bahasa Inggris Kelas XII SMA/MA/SMK/MAK". In this case, the author uses document analysis as a data collection procedure. The data analysis used is to organizing & familiarizing, coding & reducing and interpreting & representing. The writer also uses investigator triangulation to assess the reliability of the data from the results of this article.

RESULTS AND DISCUSSION

1. Types of Lexical Ambiguity in English Textbook with entitled “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”

In this section, it describes the identification of types of Lexical ambiguity in English textbooks with tittle “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”. This research, the researcher chose lexical ambiguity that classified by Stephen Ullman. Ullman classified lexical ambiguity into 4 types, namely Polysemy, Homonymy, Homophones and Homographs. The data from this study are words that are included in lexical ambiguity in a book published by the Ministry of Education and Culture with a 2013 curriculum and it is a revised edition of 2018 with the title “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”. The researcher got the data by reading the student textbooks which was found on the chapter marked with reading comprehension. To make it easier to analyze the data, the researcher classifies words that have lexical ambiguity into each type in the table (**See appendix 1 for detailed classification**).The researcher found several words that consist of the type of lexical ambiguity according to Ullman. After classifying the data, the researcher found 25 words that were included in the word lexical ambiguity. Furthermore, to make the classification clear, the researcher has drawn the findings in the graph below.



**Figure 4.1 Lexical ambiguity in the textbook entitled
“Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”**

From the 4 types of ambiguity that have been classified by Stephen Ullman, in this English textbook, the researcher only found two types of Lexical ambiguity. There are Polysemy and Homonymy. The researcher found 14 words that were included in lexical ambiguity, namely type polysemy and found 11 words that were included in Homonymy, while words that had type homographs and Homophones were not found in this study. (see appendix 2 for detailed data analysis). Each type of lexical ambiguity has been drawn in four colors (see figure 4.1). The blue parts are represented as polysemy, and orange parts are represented as Homonymy presuppositions, grey parts are represented as Homographs, and yellow parts are represented as Homophones. In Figure 4.1, the frequency of each type of Lexical ambiguity is shown in a pie chart. The blue part which is included in the lexical ambiguity of polysemy has reached 56% and is the largest part. That is, polysemy is the most dominant type of lexical ambiguity. This is in accordance with the notion of polysemy, which is a word that has two or more different but related meanings. And the orange part which is included in the lexical ambiguity of the Homonymy category reaches 44%. While in this research, the researcher did not find lexical ambiguity with the type of Homograph and Homophones.

2. Implemented of Lexical Ambiguity in English Textbook with title “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”

The second problem statement of this research is “How is Lexical ambiguity implemented in English textbook with the title “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK”. In this section, the researcher explains about how to implement it in an English textbook entitled “Bahasa Inggris Kelas XII SMA/MA/SMK/MAK” To answer the two research problem question, the researcher analyzed the data by understanding the context of the data, it is the words which has ambiguous words that refer to lexical ambiguity. Furthermore, the following analysis will be described below.

1. Polysemy

Polysemy is a speech in the form of words with different meanings, but there is still related with other meanings. It means that the word has multiple meanings, but each meaning is connected to the other meanings. The lexical ambiguity in that categorized as Polysemy can be seen as below :

CH 2/TS 1/LN 03/17

Arrive with this list in **hand**

It is classified as Polysemy because the word **Hand** has two different meaning but still related. So that, it Contains as Lexical ambiguity, especially in polysemy. Based on Merriam webster dictionary the word **Hand** has two meanings, the first meaning is the part of body at the end of the arm of a human or the second meaning is something resembling a hand. So that the sentence above can be said to be ambiguous because it can be interpreted as arrive and bring a list that has been written in hand or arrive and bring a list that has been written on a note. And in this data, the word **Hand** have meaning something resembling a hand.

CH 2/TS 1/LN 08/17

Feel the fresh air on your **face** as you sail to Bainbrige Island.

It is Classified as polysemy because the word **Face** has two different meanings related. The first meaning of the word is **Face** as the front of the head and the second meaning is a surface of a thing or countenance. And in this data the the word **Face** have meaning as the front of the head.

CH 2/TS 1/LN30/18

Make sure you **take time** to spot these beloved icons

The word **take time** is ambiguous but it still related. This is the reason why it can categorized as polysemy. **Take time** is a word that ambiguous, because it can means that spare a time to spot these beloved icons or it can means that you need a more time to spot these beloved icons. Actually, both of the meaning have the same meaning according to the understanding of polysemy. But the writer here chooses the first meaning refer the word take time.

CH 2/TS 1/LN45/19

See exciting and experimental works at Chihuly Garden and Glass.

The word **see** is categorized as polysemy. Because it has two meaning but still related. Based on merriam webster dictionary, The first meaning of **see** is too perceive by the eye, or it can means to imagine as a possibility. so it can be concluded that seeing Chihuly Garden and Glass. directly with the eyes or just imagining it.

CH 2/TS 1/LN47/19

See exciting and experimental works at Chihuly Garden and **Glass**

The word **Glass** is categorized as lexical ambiguity and it is Classified as Polysemy because it has two meaning but still related. In merriam webster dictionary, the word Glass has two meaning which is the first meaning is Glass or a cup for drinking and the second meaning is a mirror. And in this data the word **Glass** have a meaning mirror or (*kaca*)

CH 2/TS 1/LN/61

Watch the world's most sophisticated aircraft

The world **watch** is categorized as lexical ambiguity and it is classified as Polysemy because it has two meaning and unrelated. Based on merriam webster dictionary, the word watch has two meaning which is the first meaning is to look at and the second meaning is to keep. And in this data the word **Watch** have a meaning to look.

CH 4/TS 1/LN13/50

Please call me after 4.00 p.m

The word Call is categorized as polysemy, because has different meaning but still related. Based on merriam webster dictionary The word call can means to utter in a loud distinct voice often used without or to announce or call someone over the phone. And in this data, the word Call have meaning call someone over the phone

CH 6/TS 1/LN17/84

I just want to get her into a good school

The word Good is categorized as Polysemy in lexical ambiguity because it has two related meaning. Based on merriam webster dictionary The word Good can means as a kind or a favorable character or tendency, and the second is a something that conforming to the moral order of the university. And in this data the word Good have meaning something that conforming to the moral order of the university.

CH 6/TS 1/LN34/85

Where students vie for seats with other students throughout the country.

The word seats has two related meaning. So it can be as lexical ambiguity in a part of polysemy. Based on Meriam webster dictionary, the word chair has two meaning which is The first meaning is a chair (thing) and the second meaning is about a special chair of one in eminence, or people who have a position. In this data, the word Seats have meaning a special chair of one in eminence.

CH 6/TS 1/LN39/85

Head of the Jakarta Education Agency

It is categorized as polysemy because the word Head has two meaning but it still related. Based on Meriam webster dictionary, the word head has two meaning which is The first meaning is talk about the upper part of the human body. And the second meaning is a leader the Jakarta Education Agency. In this data, the word Head have meaning the leader.

CH 6/TS 1/LN52/85

Meanwhile, acting Jakarta governor Basuki Tjahaja Purnama said that the parents should be patient

The word acting is categorized as lexical ambiguity especially in polysemy because the word has two related meaning. Based on merriam webster dictionary, the word acting has two meaning which is the first meaning is a someone that holding a temporary rank or position and the second meaning is a someone that suitable for stage performance. And in this data, the word acting have meaning someone that holding a temporary rank or position.

CH 7/TS 1/LN2/99

Indonesia has opened a regional recycling conference aimed at increasing awareness of waste management

The word aimed is categorized as polsemy because it has two related meaning. Based on merriam webster dictionary, the first meaning is intended to direct to a specific goal. And the second meaning is to aimed specifically means to point the weapon at an object. And in this data the word aimed have meaning intended to direct to a specific goal.

CH 7/TS 1/LN19 /100

The mayor said that the city also runs a program

The word is categorized as Polysemy because the word runs has two meaning related. Based on Meriam webster dictionary is the first meaning of runs is to go faster than a walk, and the second meaning is to continue an operation or production . And this data, the word runs have meaning to continue an operation.

CH 10/TS 1/LN7/140

You need to understand how the five most important photoshop tools work.

The word tools categorized as polysemy because the word has two meaning related. Based on merriam webster dictionary the word of Tools can means as a handled device that aids in accomplishing a task and it is an element of a computer program, and the second meaning is machines tools. And the data of the word tools have meaning an element of a computer program.

2. Homonyms

Homonyms or Homonymy is defined as the case where two or more words that have the same phonological form and pronunciation, but the meaning are unrelated.

CH 2/TS 1/LN 07/17

Feel the fresh air on your face

The word air is classified as Homonyms because it has two meaning unrelated. Based on merriam webster dictionary the word air can means a light breeze or a mixture of invisible odorless tasteless gases (such as nitrogen and oxygen) that surrounds the earth. And the second meaning is appearance, or bearing of a person especially as expressive of some personal quality. And this data, the word air have meaning a light breeze or a mixture of invisible odorless tasteless gases (such as nitrogen and oxygen) that surrounds the earth.

CH 2/TS 1/LN 24/18

Its entire district is full of shopping, attractions, and favorite sight

The word Sights is categorized as Lexical ambiguity which classified in Homonymy because the word Sights has two meaning and it is unrelated. The reason why this word has two meaning unrelated is, because the first meaning of sights is, it can be something that is seen or a view. And then the second meaning is a rifle. And in this data the word sight have meaning something that is seen or a view.

CH 2/TS 1/LN 25/18

The area is festival of sounds, tastes and smells and its part of the reason.

The word tastes is categorized as Homonyms because it has two meaning and the meaning is unrelated. Based on merriam webster dictionary the first meaning of tastes is to ascertain the flavor by taking a little into the mouth or the second meaning is to become acquainted by experience. And in this data, the word tastes has meaning of getting acquainted with experience

CH 2/TS 1/LN29/18

Unless you have allergic to noises.

The word noises I categorized Homonyms because has two interpretation and unrelated. Based on Meriam webster dictionary is, The first meaning is about a sounds that is undesired or interferes and the second meaning is electromagnetic radiation. In this data, the word noise has the meaning of unwanted or disturbing sound

CH 2/TS 1/LN32/18

Book a night at one

The word book is categorized as Lexical ambiguity which is classified in Homonyma, because it has two meaning unrelated. Based on merriam webster dictionary, The word book has two meaning, which is the first meaning is a word that underline is a set of written text or it can means to reserve in advance. And in this data the word book have meaning reservation.

CH 4/TS 1/LN4/50

As you can see from my enclosed resume, my experience and qualifications match this position's requirements

The word match is categorized as Lexical ambiguity that classified in Homonymy because the word has two meaning unrelated. Based on the merriam webster, the first meaning of match is a something similar or appropriate. And the second means is associated or a pair suitable associated. And in this data, the word match have meaning something that similar or appropriate.

CH 4/TS 1/LN5/50

Managing the local branch of a national shoe retailer

The word branch is categorized as Homonymy because it has two unrelated meaning. The word branch has two meaning that unrelated. Based on merriam webster dictionary The first meaning is it can means as division, and the second meaning is a natural subdivision of a plant stem. and in this data the word branch have meaning as division

CH 4/TS 1/LN11/50

I look forward to the opportunity to personally discuss why I am particularly suited for this position.

The word Forward is categorized as Homony because has two meaning unrelated. The word forward has two meaning. The first meaning is to waiting, and the second meaning is to forwarding a message (email, letter, or else). And in this data, the word look forward is to waiting.

CH 7/TS 1/LN18 /100

So you can see the reduction, which goes to composting center, also in the community, and waste management.

The word waste has two meaning unrelated, so it can be seen that the word is Lexical ambiguity that classified in Homonymy. Because The first meaning of waste is an unwanted by-product of a manufacturing process. And the second is a broad and empty expanse or uncultivated land. And in this data the word waste have meaning something that an unwanted by-product of a manufacturing process.

CH 7/TS 1/LN25 /100

They even don't use drinking straws.

The word straws has two meaning unrelated, so it can be seen as lexical ambiguity that classified in Homonyms. The first meaning of Straws it can means a stalks of grain after threshing, or it can means as a tube (made of paper, plastic or glass) for sucking up a beverage. And in this data, the true meaning of Straws something in the form of a tube (made of paper, plastic or glass) for sucking up a beverage.

CH 10/TS 1/LN26 /140

You can also do all sorts of cool things.

The word cool categorized as lexical ambiguity that is Homonymy which the word has two meaning unrelated. Cool has two meaning unrelated, the first meaning is a something awesome, and the second meaning is lacking in warmth. And in this data, the word cool have meaning something that awesome.

2.The way Lexical ambiguity implemented in English textbook entitled “Bahasa Inggris SMA/MA/SMK/MAK Kelas XII”

Lexical ambiguity is an important analysis that must be carried out, especially in this English textbook, it because By understanding the words that are included in the lexical ambiguity contained in this book, it is hoped that students, teachers, or further researchers can understand the multiple meanings and can understand them well.

In this section, the researcher discusses the relationship between the second problem formulation, namely The way Lexical ambiguity implemented in English textbook entitled "English SMA/MA/SMK/MAK Class XII". Here, the data analysis explains how lexical ambiguity is implemented in this book entitled “English SMA/MA/SMK/MAK Class XII”. The researcher analyzed this textbook using the theory from (Ullman, 1962), Furthermore, the data analysis in finding will explain more of each presupposition types in below.

1. Polysemy

Data analysis shows that there are some data of word that includes leexical ambiguity which indicates polysemy. That is because Polysemy is a word that has a double meaning but the meaning of the word is still related. As has been analyzed, there are 14 words included in Polysemy. This happens because in this English textbook, especially in the reading comprehension section, there are several words that have multiple meanings but are still related. And this is in accordance with the m eaning of polysemy.

2. Homonymy

Homonyms. In the analysis of the data, the researcher found 11 words that were included in homonyms, this was because Homonymy refers to the presence of two or more words which have the same pronunciation but different meanings and origins. "For example, the words "lie" and "lie". Both have different meanings, but produce the same sound and spelling. The word "Lie" can have meaning "Terlentang" or "Berbohong" it depends on the sentence.

3. Homophones

Homophones is a word that have the same sound, but have different spellings and meanings. Basically, homonyms and homophones are not much different. Because, homophones are part of homonyms. For example the word "see" and "sea", and then the other examples of homophones are "to", "too", and "two". These three words do have different spellings and meanings. "To" is one of the prepositions, "too" means "Juga", and the word "two" means "dua". However, all of them produce the same sound but have different spelling and meanings. Therefore, these three words are classified as homophones. And in this research, the researcher did not found the word that categorized as Homophones

4. Homograph

Homograph is also the part of Homonyms but the different is in the spelling. As explained before, Homonyms is a two or more words which have the same pronunciation but different meanings and origins,. Meanwhile Homographs is a word that words that have the same spelling, different pronunciation, and different meanings. And in this research, the researcher did not found the word that categorized as Homograph.

Example :

Desert (DEH-zert) : Padang pasir/Gurun

The Sahara Desert

Desert (de-ZURT) : Meninggalkan

She was deserted by her boyfriend

5. Conclusuion

Based on the results of the research in the previous chapter, there are 25 words that are included in lexical ambiguity in an English textbook with the title English Textbook "English Book for SMA/SMK MA/MAK". In this study, Ullman's 1972 theory is used, in which lexical ambiguity is divided into polysemy, homonym, homophone, and also homograph. This study found 25 words consist of Polysemy and Homonymy. Among them, there are 14 words that included in Polysemy, and 11 words that included in Lexical ambiguity with Homonymy type. Basically Homographs and Homophones are part of Homonyms, but there are some differences in meaning, such as differences in pronunciation and spelling, because this study is an English textbook so the researchers found that many words that are consists in the Polysemy and Homonymy.

References

- Andarani & Anugerahwati. (2012). Structural ambiguity in The Jakarta Post newspaper's headline news. Journal article: State University of Malang
- Arizona, N. (2016). The lexical ambiguity in the cosmetic advertisements. Thesis of Sanata Dharma University Yogyakarta

- Ary, D., Jacobs, L. C., Sorensen, C., & Razavieh, A. (2014). *Introduction to Research in Education*. Canada: Wadsworth.
- Cresswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (third edition)*. London: Sage Publication Ltd.
- Charina, Intan Nur. 2017. "Lexical And Syntactic Ambiguity in Humor". *International Journal of Humanity Studies*. Vol 1 (1). e-ISSN 2597-4718. Hal: 120-131. <http://ejournal.usd.ac.id/index.php/IJHS> Sanata Dharma University, Yogyakarta, Indonesia
- Denzin, N. K. (2009). *An Introduction to Qualitative Research Fourth Edition*. Thousand Oaks: SAGE.
- Leech, Geoffrey. (1981). *Semantics: The study of meaning*. London: Penguin Books.
- Litosseliti, L. (ed.) (2010). *Research Methods in Linguistics*. London: Continuum Merriam Webster Dictionary [app].
- Purwaningsih. D. (2014). An analysis of lexical and structural ambiguity "Rubrik Opini" in Jawa Pos. Thesis of Wijaya Putra University (7)
- Puspitasari, J., Sutjiati Beratha, N. and Wandia, I., 2019. Lexical and Structural Ambiguity Found in Articles in The Jakarta Post Daily Newspaper. *Humanis*, p.19.
- Ramadani, Nanda. 2015. "Lexical Ambiguity In The Headlines Of The Jakarta Post Newspaper". *Vivid Journal*. Vol. 4 (1).<http://garuda.ristekdikti.go.id/journal/article/359492>
- Tambunan. H. (2009). "The analysis of lexical and structural ambiguity in your letters of The Jakarta Post". Thesis Medan: University of Sumatera Utara. (7)
- Tirangga. B. (2014). Lexical and grammatical ambiguities of the news headline of the Jakarta Post and New York Times. Journal article of Dian Nuswantoro University Semarang. (7)
- Ullmann, Stephen. (1962). *Semantics: An Introduction to the Science of Meaning*. London: Oxford Basil Blackwell.