
ENHANCING STUDENTS' TECHNICAL VOCABULARY SIZE BY USING FRAYER MODEL GRAPHIC ORGANIZER

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ABSTRACT

English vocabulary seems to be a crucial problem experienced by non-native students in STMIK Jayanusa Padang. Their low vocabulary knowledge caused several problems in understanding a text especially related to technical vocabulary. The purpose of this research was to improve the students' technical vocabulary size of the third-semester students at STMIK Jayanusa Padang through the Frayer model graphic organizer. This research used classroom action research. The data was collected through tests, field notes, and interviews. The findings of this research revealed that there was an improvement in students' technical vocabulary size obtained from the pretest, cycle 1 to cycle 2. The average score of the pretest was very low, 0.4. Then, it gradually improved in cycle 1 became 0.83 with an increasing point was 0.43 points. Next, the average score found in cycle 1 then better improved in cycle 2 which turned into 1.43 with the increasing point from cycle 1 to cycle 2 was 0.6 points. Shortly, Frayer Model influenced the enrichment of students' technical vocabulary size.

Keywords: Technical vocabulary, Computer English, Frayer Model Graphic Organizer

INTRODUCTION

This paper investigates the proper strategy in learning technical vocabulary in STMIK Jayanusa Padang. Teresa and Nation (2003) highlight technical vocabulary as largely of interest and use to people working in a specialized area. However, Afzal (2019) advocates that the language learner must enrich their word-repository and develop linguistic repertoire by enhancing vocabulary. Vocabulary is considered a crucial tool for communication. Alqahtani (2015) declares that limited vocabulary knowledge poses many problems to its learners, which consequently affects English language learning. Richards & Renandya (2002) then argue that the language of human beings builds on the vocabulary used and gained. Low vocabulary knowledge can limit students' language use.

Plenty of sources to enrich vocabulary are available and accessible broadly around the students' daily life. The media today used English in providing and delivering information. Some examples of media and websites that can utilize the students in learning English are

youtube, movies, songs, magazines, ebooks, facebook, Instagram, and Twitter. These media are really helpful ways to practice English and improve the ability in mastering a foreign language. Moreover, recently Indonesia faces the 4.0 industry which requires good English to communicate and compete with other countries in the term of technology development.

In line with the above issues, the students of STMIK Jayanusa have been prepared to face the 4.0 industry. They have to take English 1 to English 7 subjects during their education process. During this range, they are provided with the four skills of English. Moreover, they have an additional meeting every week to practice their English speaking and listening skills with the guidance of their lecturer. The third-semester students as the sample of this study have taken English 1 and English 2 subjects. However, they had several reading comprehension problems. Most of the students have difficulties in understanding the important ideas in reading passages. The word recognition, weak phrasing, and fluency caused them to frequently avoid reading activity and reading tasks related to English. The problems that the researcher found shown that most students still have limited vocabulary although they have learned English for years in their formal education institutions.

Moreover, for a specific purpose, students who learn in STMIK Jayanusa have difficulties in understanding their reading text since in the text they found computing vocabularies that unfamiliar with them. They have constraints and difficulties in understanding new technical words in computing English. Mostly, it is caused by the lack of English technical vocabulary amount which affects their abilities in finding the correct meaning of the words and convey the message written in the text. Besides, they need much time to understand even only a few lines of sentences in the text. These problems caused the students could not answer any questions that followed the reading text.

This condition forces the lecturer to find the best strategy to get the result as expected which is the improvement of their literacy skills especially in understanding the vocabularies. One of the effective ways which are assumed in helping students to enrich their vocabulary understanding is the frayer model. The frayer model helps students go beyond definition to examine the concept through the graphic organizer. The frayer model was developed by Frayer et al in 1969 (NBSS, 2016). the graphic consists of definitions, characteristics, non-characteristics, examples, and non-examples. It can be used before reading to activate prior knowledge, during reading to monitor vocabulary, and after reading to assess vocabulary (Rahmadani, C, 2018). So, the frayer model can be said as an ideal strategy for teaching critical content of English vocabulary in-depth and contrast it in similar concepts. (NBSS, 2016). It was hoped that the frayer model can help students to define unfamiliar

concepts/words/terms of computer English and can describe its essential characteristics complete with its examples.

Generally, learning the vocabulary helps acquire language, develop the learners' reading proficiency, and is beneficial for reading comprehension (Tozcu & Coady, 2004). Learning vocabulary helps students understand and communicate with others in English. In STMIK Jayanusa Padang, students need to know several technical vocabularies related to computers to maximize their learning in operating a computer that uses English as the language of instruction. Nation (2001) states that there are four purposes in learning a language; they are Language, Ideas, Skills, and Text (LIST). He further says that vocabulary stands as a significant component in the discussion of a language besides pronunciation and grammatical construction. The relation between vocabulary knowledge and language use is complementary. He convinces that knowledge of vocabulary enables language use and leads them to an increase in vocabulary knowledge. He realizes that learning vocabulary items play a vital role in all language skills (ie. Listening, speaking, reading, and writing).

Correspondingly, Ur (2005) proposes that the vocabulary to be used to talk about should be selected as far as they are related to the theme or sub-theme being discussed. Moreover, Nation (2001) has distinguished four kinds of vocabulary in the text, they are; high-frequency words, academic words, technical words, and low-frequency words. He further explained that the technical words mean the words in the text that are very closely related to the topic and subject area of the text. These vocabularies are quite familiar in the topic area but not so common elsewhere. Technical vocabularies typically cover about 5% of the running words in a text. So, we will know the topic is being talked about as soon as we see them in the text.

In English for Specific Purpose (ESP), technical vocabulary is vital for English language learning among all types of vocabulary (Nation, 2001). Wanpen, Supatra et al (2012) defined technical vocabulary as the words that are closely associated with learners who have a specific purpose in language learning. It provides a specialized meaning which differs from its common meaning when used in a specific field. However, this kind of vocabulary sometimes has some degrees of overlapping if it is used among general vocabularies. Since the students of STMIK Jayanusa Padang encounter a specific context, they have to have an adequate ability to construct meaning based on their previous knowledge when learning a computing text. According to Blachowicz CLZ, Peter F (2004) a learner's background knowledge and prior experiences are extremely crucial in vocabulary

development with the more background knowledge they have to support understanding while reading texts.

Nevertheless, in ESP learning, the amount of technical vocabulary may be huge and cannot be neglected. Undeniable learners should be helped by appropriate Vocabulary Learning Strategies (VLSs). Nation (2001) highlights that VLSs enable learners to control their way of learning and be more responsible for their vocabulary learning.

Many researchers have proposed various strategies in vocabulary learning. However, this study adapted the Frayer Model as an ideal strategy since it teaches critical content vocabulary by defining the concept in-depth and comparing it with opposite concepts. Frayer Model is a graphic organizer that helps students determine or clarify the meaning of vocabulary words (Ramadani, C, 2018). The understanding of the concepts leads students to go beyond definition. They can see what the concept is and what it is not, and provide examples and non-examples. In addition, Shoob and Stout (2008) argue that the Frayer model promotes critical thinking and helps the student to identify and understand unfamiliar technical vocabulary.

National Behaviour Support Service (2016) states some steps in explicitly teaching the Frayer Model. Nevertheless, the researcher has modified some steps based on the need for this study and the time available. The steps are:

Step 1: Explain the Frayer Model chart to the class by using technical vocabulary to demonstrate the various components. Model the type and quality of desired answers when giving examples. Think out loud as you try to come up with examples and non-examples, etc. Picture/symbols also can be used.

Step 2: Review a pre-selected list of technical vocabulary with the class before reading about the topic in the textbook. Show the example of the Frayer Model completed chart to the students and explain every part of it (see figure 2).

Step 3: Pass out blank copies of the Frayer Model chart and ask students to choose a technical vocabulary from the text and complete the Frayer Model chart (see figure 1). In this step, each student should write a different technical vocabulary.

Step 4: The students share their completed charts. Students are allowed to add additional examples/images/symbols to the Frayer chart until all four categories are substantially represented.

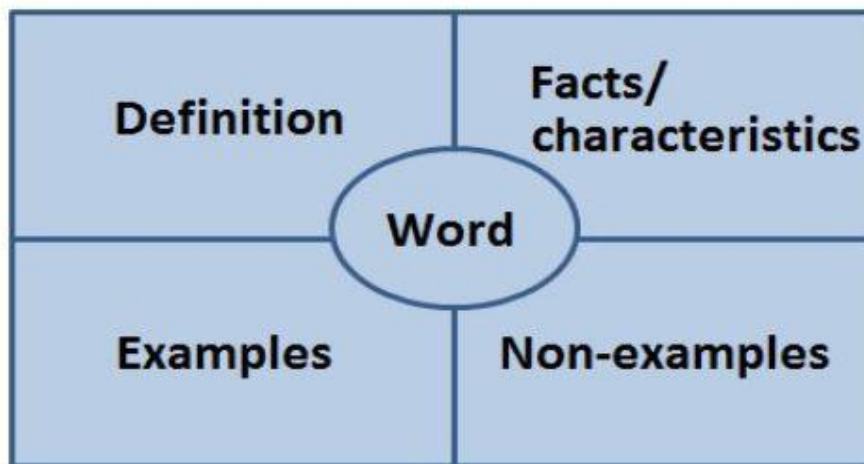


Figure 1. Frayer Model Chart

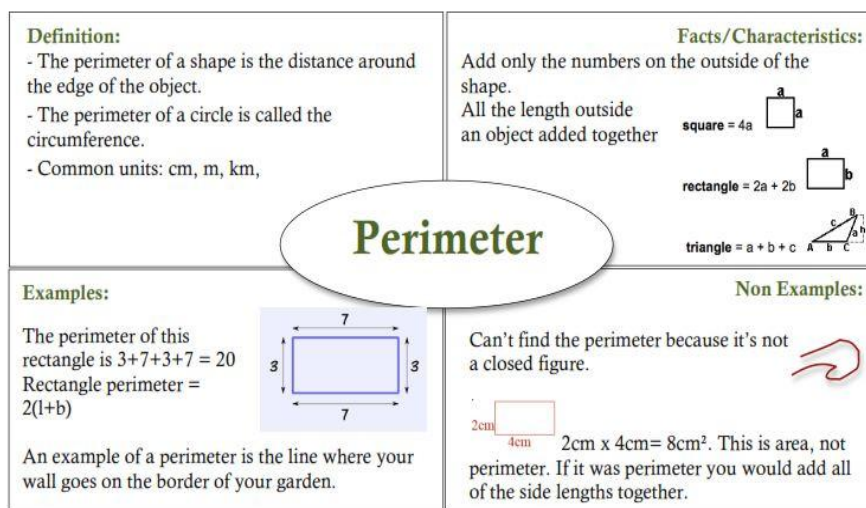


Figure 2. The example of the Frayer Model Completed chart

There are some advantages and disadvantages of the Frayer model proposed by Ramadani (2018). The advantages are:

1. This strategy is excellent for revising vocabulary
2. It forces students to be active because every student has to define a concept/word/term
3. It allows all students to describe the characteristics, provide examples, and suggest non-examples of the words
4. It promotes students' critical thinking as they are asked a thoughtful question to narrow down a wide range of words to one "secret word"
5. It provides a good activity for reviewing important vocabularies at the end of the lesson

The disadvantages are:

1. Some students will be passive because they have a lack vocabulary
2. The implementation of the strategy need much time

This research, therefore, aims to improve the students' technical vocabulary size of the third-semester students at STMIK Jayanusa Padang through the Frayer model graphic organizer.

METHOD

The design of this research was action research. According to Hopkins (2014), This kind of research was done in the classroom by implementing a certain method to improve a particular setting or situation and solve the problems faced by the students. The population of this research was the third-semester students of English 3 in STMIK Jayanusa Padang with a total number of 30 students. It was conducted in two learning cycles. Each cycle consisted of four steps of the cyclical process. Namely; planning, action, observation, and reflection. One period was carried out in 2 meetings, with the duration of each session for 2x45 minutes (2 credits). The first cycle was held on November 5th and 12th 2019, the second cycle was held on November 19th and 26th 2019. They could be described as follows:

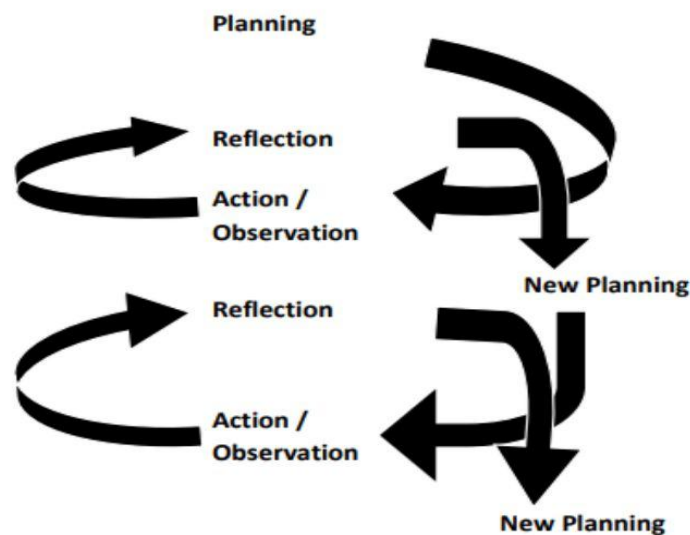


Figure 3. The Action Research Spiral

(based on Kemmis and McTaggart 1998 in Hopkins: 2014)

Based on the cycles above, it can be explained that there was a plan where the researcher had to make a lesson plan before teaching, there were also action and observation during the teaching process, and a reflection that was required by the researcher where it

could be used to make any improvements for the following cycle. Because an improvement was needed, a revised plan was then made and the researcher must continue to the next cycle. The research finished the cycle since there were no more problems that appeared at the end of any cycle. Thus, it can be said that the expected result of the research was gained.

In collecting the data, there are three instruments used: (1) Test. The test is conducted to see the students' responses toward the text and to know students' technical vocabulary size. It is also conducted to gain information on the effectiveness of using the Frayer Model in identifying and defining unfamiliar technical vocabulary. (2) Observation. The second technique of collecting qualitative data is observation. For this technique, the researcher will use observation checklists and fieldnotes. (3) Interview. In this step, the interview as one of the instruments to collect the qualitative data was done to get the students' answers and feelings toward the process of teaching and learning in the classroom. It is taken from the students at the end of every cycle.

Furthermore, the data were analyzed qualitatively to see the changes in the level of student's understanding of technical vocabulary in computing text. The level of achievement that was employed by the researcher taken from the National Councils of Teachers of English (2010). The graphic of the scoring rubric of the data was shown as follows:

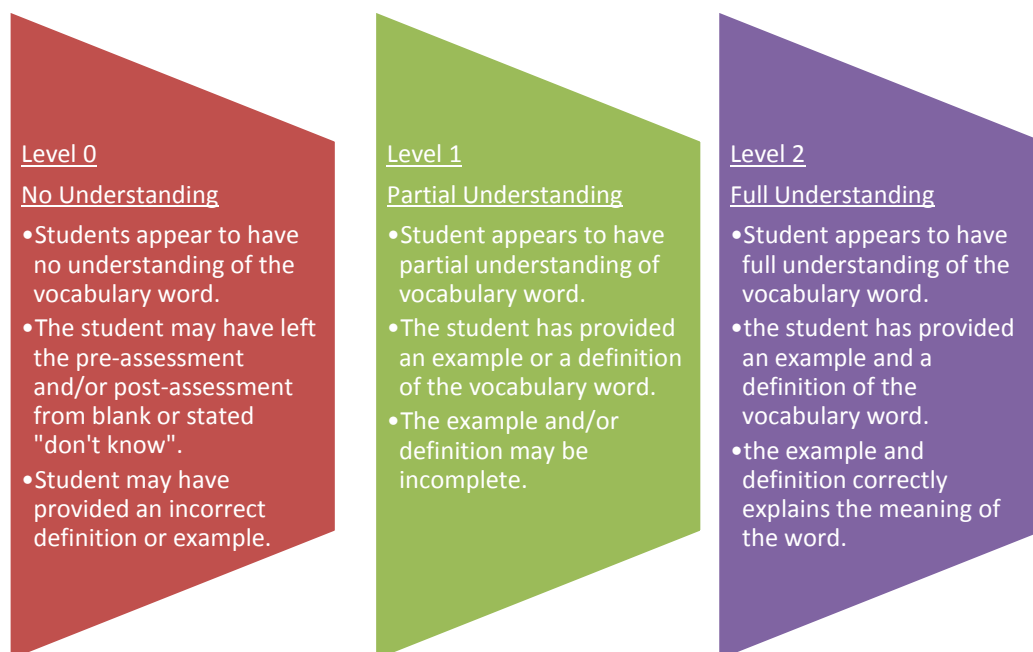


Figure 4. The students' vocabulary scoring rubric

The researcher, then, took the frequencies of the data from the table and made a total percentage of the data as well. The frequencies and the percentages of the data contained the

score interval achieved by the students. Moreover, taking the frequencies and percentages of the data was aimed at making the data of the obtained score before interpretable easily.

FINDINGS AND DISCUSSION

Findings

Before conducting the research, a pretest was given to see the initial achievement of the students. The score of the pre-test showed that most of the students got a low result in understanding the technical vocabulary test. They were not mastered in defining each part of the Frayer graphic organizer such as definition, characteristics, examples, and non-examples. It could be concluded that the students had low performance in understanding the technical vocabulary as well.

The data from the pre-test was also supported by some interviews with the students. Through the interview, the researcher discovered that most of the students got difficulties in improving their understanding of technical vocabulary and the students were not accustomed yet to the use of Frayer graphic organizer even though the students looked enthusiastic and interesting in viewing the stages in the Frayer model.

After implementing the four stages in the Frayer model in the first cycle, a posttest was carried out at the end of the first cycle. The researcher gave an individual technical vocabulary test to the students as one of the instruments to improve students' technical vocabulary size. The result of the improvement of each indicator of pretest and posttest of cycle 1 can be seen in the following chart:

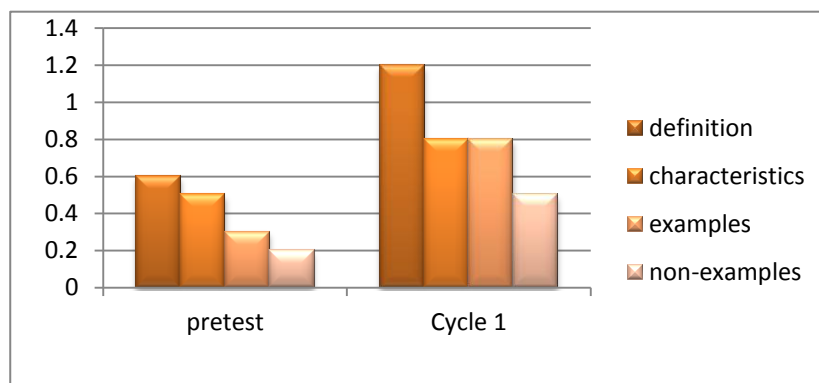


Figure 5. The comparison of test results in pretest and cycle 1

From the chart, it can be explained that there was a poor score gained by the students in definition in pretest, the score was 1; but then their mean score inclined to raise gradually in cycle 1 which showed that the result was 1.5. Furthermore, we could see that in describing the characteristics the students still gained low scores in pretest; however, there was a better

improvement in cycle 1 as shown in the chart above that the score was 1; On the other hand, the researcher found for example the mean score in pretest was 1.5 but then the result increased sharply in cycle 1 that there was 2 in this cycle. In the last indicator, the improvements also happened in giving non-example, the score was increased from 0.5 to 1. Thus, the researcher still needed some extra works to make the students could improve their technical vocabulary size and also gain a good score in the next two cycles since the result of both tests in pre-test and cycle 1 showed that the students were still not able to gain good score and indicated that their performance in reading computing text was still poor. Thus, the researcher and the collaborator collaboratively decided to revise the plan to be performed in cycle 2.

In the second cycle, the indicator of the students showed a higher percentage than the first cycle. The researcher and the collaborator revised the planning of teaching. The chart was then distributed per person to make the student had more concentration on filling the Frayer graphic organizer. Students are also asked to broadly develop their critical thinking to define the target technical vocabulary words, they should consider the context as well. The students are then guided to identify the characteristics and the facts they know about the word. When giving example, the students are asked to find out the similar things that had the same characteristics but are different in use or reverse as an example of the word. The antonym of the word also can be used as non-examples of the word.

The data gained in cycle 2 proved that there was an improvement in students' recount writing skill if we compared with the test result in cycle 1. The Table below would give the comparison of the improved result from pretest, cycle 1 to cycle 2:

Table1. The Improvement of Students' Technical Vocabulary Size

Indicator in Frayer Model	Pretest	Cycle 1	Cycle 2	Escalation
Definition	0.6	1.2	1.8	0.6
Characteristics	0.5	0.8	1.5	0.7
Example	0.3	0.8	1.5	0.6
Non-example	0.2	0.5	1	0.5
The technical vocabulary size	0.4	0.83	1.43	0.6

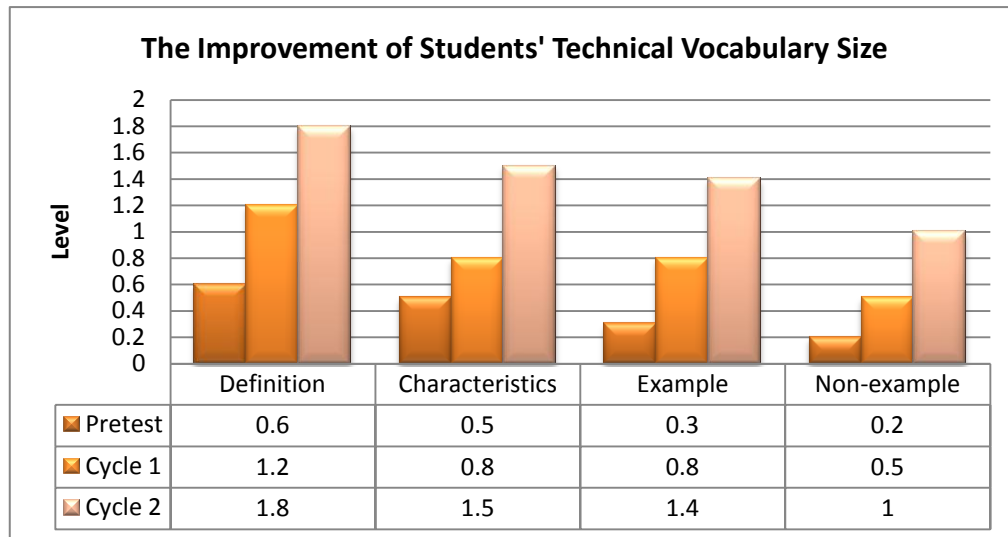


Figure 6. The comparison of test results from pretest, cycle 1 to cycle 2

The chart above illustrated that the improvement of students' technical vocabulary size obtained from the pretest, cycle 1 to cycle 2. The average score of the pretest was very low, 1.4. Then, it gradually improved in cycle 1 which became 0.83 with an increasing point was 0.43 points. Next, the average score found in cycle 1 before then better improved in cycle 2 which turned into 1.43 with the increasing point from cycle 1 to cycle 2 was 0.6 points.

Discussion

The Frayer Model is a graphic organizer that helps students determine or clarify the meaning of technical vocabulary encounter while reading a text. NBSS (2016) states clearly that when the students were asked to analyze the concept of the words, the Frayer model prompts students to understand the words in a larger context. Ramadani (2018) asserts this model aids students to go beyond definitions to examine a concept by graphically organizing their prior knowledge into different areas. It is supported by Aryanti (2017) the Frayer model technique could improve students' understanding of new words particularly in meaning, synonym, and antonym aspects. According to the findings, it was clear that the definition indicator got a higher result in every cycle than characteristics and example results. This indicator was the core of the graphic, the students seemed enthusiastic to define the technical word they got as clear as possible. Here are some of the results of the Frayer model graphic organizer that has been filled by the students:

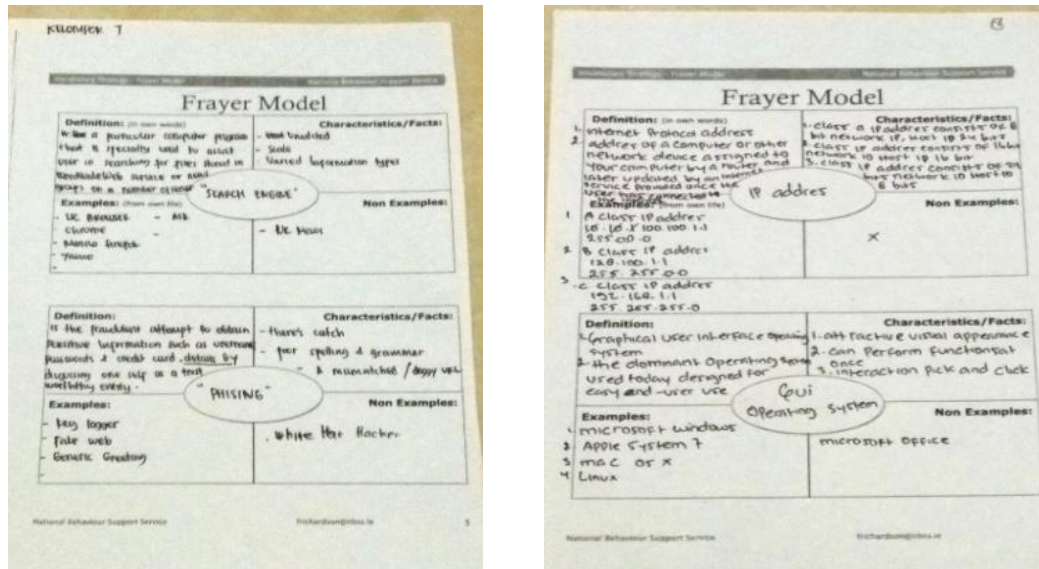


Figure 7. Student's work on Frayer model graphic organizer

On the other hand, implementing the Frayer model graphic organizer in learning new computing technical vocabulary made the students examined words in-depth in content areas and shared the idea. According to Nation (2001), technical vocabulary contains a variety of types that range from words that do not usually occur in other subjects area to those that are formally like high-frequency vocabulary. It was proved by the researcher when she implemented the Frayer model at third-semester students of STMIK Jayanusa, where the average score of cycle 2 reached 5.7 point. It was higher than the average score in cycle 1 which was 3.3 point. So, the increasing point from cycle 1 to cycle 2 was 2.4 point. This part might be easier for them because they were given the freedom to read many sources and express their feeling or attitudes toward the technical words that they found in their daily life. Discussing and defining a word in detail can stimulate students' critical thinking skills as they are asked to narrow down a large list of specific detail about the word itself (Ramadani, 2018).

In addition, there was also the characteristic as one of the indicators of technical vocabulary also get a better result than the example and non-example categories. This is due to the reason that the students can share their ideas with other friends in deciding the correct characteristics that appeared in the technical vocabulary. Together, students can use their prior knowledge of the built connection among new concepts by describing them. Alqahtani (2015) agrees that some words will be easily explained by contrasting it with its opposite because it can show a clear difference between the two. Moreover, if the visual reference in comparing the attributes and examples specifically (Aryanti et al, 2016) The student also

involved in the technical vocabulary directly, so the flow of the graphic organizer filling process will be easier. As a result, students can arrange their ideas and understanding more easily.

According to the result of the interview feedback, most students thought the activity was particularly difficult. Nevertheless, they found it interesting and challenging, and also meaningful and helpful in developing their technical vocabulary size. They also commented that they learned more reading skills. For instance, by defining some technical vocabulary they found in the text. They took it as an opportunity to learn new vocabulary as well. Overall, the activity was worth doing and it gave a meaningful context to stimulate reading. Without the anxiety to understand the entire reading text, students can focus on specific technical vocabulary and the context it is used to. In particular, this technique could improve the students' understanding and ability to use language appropriately in various reading contexts. Furthermore, Ramadani (2018) convinces that if this strategy can be applied continuously, it can better improve student's vocabulary mastery in long-term memory.

However, there were also some weaknesses in implementing this strategy. Not all the members of the group participate actively in doing the Frayer model chart. Because they only listen to their friends' statements without trying to express their ideas related to the definition, characteristics, example, or non-example. These advantages were in line with Ramadani (2018) who states that some students tend to be passive because they have a lack of vocabulary. Meanwhile, in another group, their enthusiasm for speaking caused noise in the classroom. They snatched away to speak up loudly, and this condition made another group feeling uncomfortable and the class atmosphere was not conducive. Another weakness was supported by Ramadani (2018) who says that this strategy needs much time, Every student needed time to read and comprehend the chart they got and should change it with another group alternately.

In general, all of the indicators got better improved from cycle to cycle in this research. Though, some indicators have not got the maximal score. It still needs further research to be able to improve all the aspects of students' understanding of technical vocabulary.

CONCLUSION AND SUGGESTION

All the indicators of this research such as definition, characteristics, example, and non-example gradually increased in each cycle after being taught by the Frayer model. Students' conceptual understanding has developed. This strategy assisted the students to promote their critical thinking to understand unfamiliar technical vocabulary in content areas. Based on the

result of data collected in this study, it can be concluded that the use of the Frayer model has better-improved students' technical vocabulary size at semester 3 of STMIK Jayanusa Padang.

In addition, the interview results described that there were also some strengths and weaknesses in the implementation of the Frayer model graphic organizer. To minimize the weaknesses, the teacher should be more actively involved in defining the text that fit the students need. The teacher is required to control the smooth of the sharing steps and make sure every student paid attention to their friends' works. Nevertheless, further research about the use of the Frayer model is needed to be done due to this model was very useful but spent much time in implementing it.

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