

A Comparative Study Between Frayer Model And Concept Mapping Strategy to Enhance Students' Vocabulary Acquisition

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ABSTRACT

This study intends to find out what is the initial knowledge of the students before they were treated using Frayer Model and Concept Mapping Strategy, ascertain of the significant difference between these two teaching strategies, and to know the responses of the students after they were taught using Frayer Model and Concept Mapping Strategy are the aims of this research. This is a quantitative study with comparative design to know the students' vocabulary acquisition test. The research instrument of this study is pre-and-post-test. This study was conducted among eleventh grader students at SMAN 1 Parongpong. The results of this study showed that the initial score for both respondents are quite similar with the score for FM group which is 30.50 and for CMS group which is 33.40. It is also known that there is a significant difference in students' vocabulary acquisition between students who are taught with Frayer Model and those who are taught with Concept Mapping Strategy showed by the result of the mean differences from both groups are $0.000 < 0.05$. The questionnaire's result also supports that both teaching strategies are eligible to be applied in teaching active and passive voice construction with the score for FM class which is 55% and for the CMS class which is 80%, it can be categorized as "Good". It implies that the implementation of Frayer Model and Concept Mapping Strategy enhances student's vocabulary acquisition.

Keywords: *Language Proficiency, Vocabulary Acquisition, Frayer Model, Concept Mapping Strategy.*

INTRODUCTION

English is an essential language to be learnt in order to meet the ability to communicate with the language itself and create connections with a wider range of the world's population. Considering the benefits of English, Indonesia has established English as a compulsory subject to be taught in the formal schools. As stated by Kemendikbud (2013), the teaching of foreign language especially English is the goal to develop students' ability to communicate to the world. In teaching English includes the teaching of four skills, listening, speaking, reading, and writing. (Panjaitan, 2016) stated that "In communication, students need vocabulary which can support them to produce and use meaningful sentences. That is why vocabulary is very important to be mastered. Students sometimes experience difficulties in using vocabulary which have been studied for some reasons.

One of important things in learning language, especially English is by mastering vocabulary. It is the basic thing in learning language because vocabulary is one of crucial aspects to support those skills. From the explanation above, vocabulary hold a crucial position in English learning (Easterbrook, 2013). Vocabulary acquisition is very important for a learner as it is related to proficiency and fluency in English. The process of learning the words of a language is referred as vocabulary acquisition. Vocabulary acquisition helps learners to use the skills of understanding, reading, writing and speaking. Therefore, as language learners, students are supposed to learn a lot of vocabulary acquisition (Avadi, 2016). Rohmatillah (2014) wrote that in accordance with learning English vocabulary, it is not the same as Indonesian vocabulary language form, including elocution and spelling. Additionally, how to articulate the word is unique in relation to composing sentences. Hence, individuals particularly students who learn English regularly discover troubles in learning vocabulary. Khan (2018), said that one of the reasons the students discover English troublesome is that they have restricted learning of words and their use in English. The vocabulary of students does not enable them to convey the appropriate words. Nation (2015), who has taught in Indonesia, Thailand, the United States, Finland, and Japan said that he always finds a problem in teaching English language from his students. The main problem is vocabulary, that students need a complex information of the meaning to reduce misunderstanding. (Virocky & Simanjuntak, 2018) said that vocabulary is the most difficult aspect of English for foreign learners to master word meanings thoroughly. Other difficulties in learning vocabulary include fixed word collocation, phrasal verbs, idioms, proverbs and regional. Based on the problems that have been mentioned above, the researcher proposed Frayer Model and Concept Mapping Strategy. Hunt (2013) stated that the Frayer Model is a graphic organizer used for concept development and vocabulary building. This model requires students to think about and describe a concept. The model is designed to have students analyze a concept, synthesize the concept, and apply the information. The Frayer Model was designed by Dorothy Frayer (1969) and her colleagues at the university of Wisconsin. Using the Frayer model is an extremely valuable tool for helping students grasp the meaning and understanding of a new concept. Besides that, there is also Concept Mapping Strategy which is defined as a vocabulary learning strategy. The strategy involves arranging words into a picture with a core concept at the center or at the top and related words linked with the key concept by lines. The visual display of a concept map emphasizes the connections between words (Bauman, 2007).

This study examines the following concerns: (1). What is the initial knowledge of students who were taught Frayer Model and those who were taught using Concept Mapping Strategy towards the enhancement of students' vocabulary acquisition? (2). Is there any significant

difference in vocabulary acquisition between those who were taught using Frayer Model and those who were taught using Concept Mapping Strategy? (3). What are students' responses after they were taught using Frayer Model and Concept Mapping Strategy?

Regarding the research questions above, the hypotheses of this study are:

Null Hypothesis (Ho): There is no significant difference between students who are taught using FM and students who are taught using CMS technique to enhance students' vocabulary acquisition.

Alternative Hypothesis (Ha): There is a significant difference between students who are taught using FM and students who are taught using CMS to enhance students' vocabulary acquisition.

LITERATURE REVIEW

A. Language Proficiency

Several applied linguists and methodologists have been attracted towards language proficiency studies and have worked on it. One of the recommendations of that commission was developing a standard way of rating language proficiency. Proficiency as having sufficient ability in language for a particular purpose. Many misconceptions about students' abilities, capabilities, and even fundamental intelligence are related to the way in which language proficiency has been defined. Specifically, students' conversational fluency in English is often mistaken as a reflection of their out-and-out proficiency in language. Language proficiency is defined as an individual's skill in language use for a specific purpose, and it can be evaluated through the application of a proficiency test (Gharbavi & Mousavi, 2012).

B. Vocabulary Acquisition

To support the students' language proficiency, they need to learn about vocabulary acquisition. Naeimi and Foo (2015) stated that vocabulary acquisition learning has long been considered as one of the essential components for developing language learning. However, language learners are required not only concerned about memorizing definitions but also integrating vocabulary meaning into their present knowledge. Many strategies such as direct or indirect ones maybe integrated to enhance vocabulary acquisition. Direct strategies emphasized that vocabulary can be learnt using tools such as dictionaries and vocabulary lists that make the students pay more attention into explicit interaction with the meaning and form of vocabulary. On the other hand, indirect strategies enhance learning indirectly. Indirect learning of vocabulary acquisition is defined as a strategy of word learning which arises without the particular intention to emphasize on word

As stated by Avadi (2016), that vocabulary acquisition is very important for a learner as it is related to proficiency and fluency in English. The process of learning the words of a language is referred as vocabulary acquisition. Vocabulary acquisition helps the learner to use the skills of understanding, reading, writing and speaking.

C. Challenges in Enhancing Vocabulary Acquisition

The researcher found four challenges for the students to increase their vocabulary. The first one is about Idioms. Basari (2015), stated that in the process of translation where there are units that cause a problem of transferring to its full meaning in the translation. One of the units is idioms;

this unit has been an interesting issue in translation. Idioms or idiomatic expressions are often used in both formal or casual situation and written or verbal communication. Idioms are colorful and fascinating unit of a language use; it shows the style in how a message is delivered. In matter of style, there are various ways and options to deliver a message. Idioms is an expression that sometimes people find it difficult to understand the meaning of the word, but the phrasal verb sometimes have meanings that can easily be guessed. In other words, idioms are more complicated in understanding the meaning then compared to phrasal verb.

Al-Otaibi (2018) said that phrasal verb is one of the English structures that pose great challenges among EFL learners despite the uncountable benefits emanating from proper use of them. English phrasal verbs are hugely frequent in everyday communication, especially in the informal register. Although, the common existence of phrasal verbs is in English conversational, but it does not mean the complete absence of this grammatical construction in formal written or verbal speech because understanding the language will be difficult if the students are not quite familiar with the meanings of phrasal verbs.

The third is about collocations. Collocation is the element that usually accompanys words. Alotaibi also said that “while without grammar very little can be conveyed, without vocabulary nothing can be conveyed”. It is accepted that choosing words carefully in specific situations is more necessary than choosing grammatical structures. Consequently, one may argue that since collocations enhance second language learners’ knowledge of vocabulary in the target language, their acquisition is vital (Alotaibi, 2015).

The last is about Pronouns. As stated by Nguyen (2017), that in many academic writing textbooks and style guides the use of pronouns is not encouraged. This is particularly problematic for non-native speakers of English who are trying to express themselves in a second language as, although personal pronouns are a clear signal of the writers’ identity and presence in a text, they are usually advised not to use them.

D. Frayer Model

From the challenges that are explained above, Frayer Model is a good strategy to help the learners. (Hidayah, 2014) stated that the Frayer Model is a strategy that helps students understand concepts and is an excellent graphic organizer that can be used as a basis for writing even with the youngest of students. It allows students to see what a concept is and what is not. The Frayer Model was designed by Dorothy Frayer (1969) and her colleagues at the University of Wisconsin. Students also demonstrate their understanding by providing examples and non-examples. The Frayer Model is especially useful for teaching vocabularies that describes concepts or vocabulary that describes concepts students may already know but cannot yet clearly define.

The Frayer Model layout can be adapted to English language learners and younger students by asking them to write a definition and associated characteristics instead of essential and nonessential characteristics. In addition, teacher can model the Frayer Model with pictures and drawings. The Frayer Model is an effective model of teaching and learning vocabulary (Urquhart and Frazee, 2012).

However, the reason for using the Frayer Model to teach vocabulary comes from its ability to provide an excellent format for students. It allows students not only determine the meaning of words but also provide their relevant characteristics, examples and non-examples. Therefore, the model is very beneficial for students to develop their vocabulary knowledge. (Talah, 2015).

E. Concept Mapping Strategy

Bauman (2007) stated concept mapping is a vocabulary learning strategy. The strategy involved arranging words into a picture with a core concept at the center or at the top and related words linked with the key concept by lines. The visual display of a concept map emphasized the connections between words.

Concept-mapping would be an excellent strategy that depends on the purpose for using it may help learners from cognitive and meta-cognitive perspective. Based on its structure, concept-mapping strategy can be used as a knowledge representation tool to provide opportunity for learners to focus on understanding the words, understand the connection between them, organize their thoughts, and build a logical connection between them, visualize the relationship between concepts in a systematic way, and reflect their understandings. The mapping strategy was useful to students not only in unifying related terms and concepts, but also in assisting them to visualize connections between vocabulary and their own interests and experiences (Khoshsima and Saed, 2015).

Adopting concept mapping in vocabulary learning provides a framework for organizing conceptual information in the process of defining a word. A typical concept mapping or graphic organizer places the vocabulary word at the center and includes additional links or concepts connected to the central word. Before reading a text, it is advantageous to become acquainted with key vocabulary terms that will guide the reading and analysis of the text. The use of concept mapping was associated with the increase in vocabulary knowledge, comprehension, and inferential knowledge (Liu, 2016).

METHODOLOGY

In this research, the researcher used comparative design to compare the students' enhancement about vocabulary acquisition by using FM and CMS between the comparative groups. In the beginning, the two groups were given pretest to know the ability of the respondent. After that, both groups were treated with different treatment and finally, at the end of the meeting, both groups had a post-test to see whether there is an enhancement on student's vocabulary acquisition or not.

Table 1. Research Design

Group	Pre-test	Treatment	Post-test
1	O	X1	O
2	O	X2	O

Explanation,

O : Vocabulary Test

X1 : Frayer Model

X2 : Concept Mapping Strategy

Population and Sample

The population of this study were all the students of grade XI and the samples of this study are two classes of grade XI at SMAN 1 Parongpong. The researcher used both classes to apply the different treatments, which are Frayer Model and Concept Mapping Strategy.

Research Instrument

The instruments were pre-test and post-test that was administered at the beginning and at the end of the program. For the pre-test the students were given vocabulary test in the form of the total number of approximately 25 multiple-choice questions, to see students' prior ability and vocabulary achievement level.

Procedures of Data Collection

In gathering data, the researcher used the following steps:

Conducting the Pilot Test

The pilot test was conducted to know whether the test given was valid or not, and to know if the questions provided are suitable for the subjects. The test was adopted from the material that was taught for the senior high school level. It consisted of 50 multiple-choice questions test.

Conducting Pre-test

The post-test which is the same as the pre-test was administered after giving the treatment to the students to see if their vocabulary enhancement increased. Post-test was used to examine the effectiveness of the techniques.

Giving Treatment

After administering the pre-test, the treatment was given to both classes. The procedures of teaching through Frayer Model was adopted from Hidayah (2014) while the procedures of teaching through Concept Mapping Strategy was adopted from Journal (2007).

Table 2. Procedures of Strategies

Procedures of Frayer Model	Procedures of Concept Mapping Strategy
<p>First step: Teacher should first distribute copies of Frayer Model graphic organizer, which is a concept phrase or a single word, depending on the needs of the students and the lesson objective.</p> <p>Second step: Student must determine the definition of the concept. Students can use their textbooks or a variety of resources to develop a definition that is clear, concise and easy to understand.</p> <p>Third step: Teacher helps the students to determine the characteristics or attributes of this concept.</p> <p>Fourth step: Finally, determine as a class what the concept is and what is not. Encourage students to generate their own examples and allow time for students to discuss their finding with the class.</p>	<p>First step: Student will create the map using the concept.</p> <p>Second step: Consider the hierarchical structure of the map and where to place the question or word on the blank paper.</p> <p>Third step: Write the question or a word on the top of the concept map, write down important related concepts below the central question or topic (these become sub-concepts).</p> <p>Fourth step: Draw a circle or rectangle around each sub-concept, stop and look at the map and begin to categorize the subtopics.</p> <p>Fifth step: Revise and / or remove unnecessary words. Use colored pencils or markers to thematically organize the sub-concepts by coloring in the shapes, draw arrows and / or lines to and from concepts to show their relationships, add a label on each arrow or line that describes the relationships between concepts</p> <p>Sixth step: Review the completed concept map by asking the question, "Does this make sense to me?". Remembering that concept maps can be as unique as the individual who created it.</p>

Post-test

A post-test was conducted to check the result after applying the treatment using FM and CMS strategies, at the end of the meetings. The post-test which contains the same question with a pre-test in the different arrangement was administered to both comparative groups.

Data Analysis on Pilot Test

The pilot test was conducted to measure the validity, reliability, level of difficulty and discrimination of the instrument. Baker (1994) stated that a pilot test can also be the pre-testing or 'trying out' of a research instrument.

Validity

The validity test was intended to find out whether the instrument is suitable to be used in the research. The following formula is used to test the validity of the instrument.

$$r_{xy} = \frac{N\sum XY - (\sum x)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}$$

(Arikunto, 2009)

Where,

r_{xy} = product correlation coefficient

X = Score item

Y = Total Score

N = Number of participants

Table 3. Validity Criteria

r_{xy}	Interpretation
$0.80 \leq r_{xy} \leq 1.00$	Very high
$0.60 \leq r_{xy} \leq 0.79$	High
$0.40 \leq r_{xy} \leq 0.59$	Moderate
$0.20 \leq r_{xy} \leq 0.39$	Low
$0.00 \leq r_{xy} \leq 0.19$	Very low

The result is as follows:

Table 4. Validity

Number of Question	r_{xy}	Interpretation
45	$0.80 \leq r_{xy} \leq 1.00$	Very high
5,16,44,	$0.60 \leq r_{xy} \leq 0.79$	High
3,7,13,19,21,22,23,25,26,30,40,41,	$0.40 \leq r_{xy} \leq 0.59$	Moderate
1,8,9,11,12,17,18,20,24,27,28,29 ,33,35,36,39,43,46,47,48,49,	$0.20 \leq r_{xy} \leq 0.39$	Low
2,4,6,10,14,15,31,32,34,37,38,42,50	$0.00 \leq r_{xy} \leq 0.19$	Very low

Based on the result above, there was 1 item that was very high. There were, 3 items that were high, 12 items moderate, 21 items low, 13 items were very low. Therefore, it can be concluded that the items that were categorized as very low are not valid.

Reliability

Reliability of a test according to Masriyah (1999: 9) is the level of stability or the stability of the measurement results. A reliable measuring tool is a measuring instrument that is used to measure the same thing repeatedly, and the results are relatively the same. The formula that will be used to find the reliability of the instrument is Alpha's formula:

$$r_{11} = \left(\frac{n}{n-1} \right) \left(\frac{S^2 - \sum pq}{S^2} \right)$$

(Arikunto, 2012)

Where,

r_{11} : Reliability all test

N : Total number of questions

$\sum pq$: Total score of each question variance

S^2 : Variance

Here is the criterion of reliability level according to Arikunto (2009):

Table 5. Classification of Reliability

Coefficient Reliability	Interpretation
0.80 – 0.99	Very high
0.66 – 0.79	High
0.50 – 0.65	Low
< 0.50	Very low

The result is as follows:

Table 6. Classification

Mean	27.44
Correlation XY	0.63
Realibility	0.77

Based on the result of realibility 0.77, then it can be categorized as high.

Discrimination Index

Discriminate index according to Ratumanan (2003) states how far the ability of the question is able to distinguish between smart student group with the weak group. The differentiation of the test items is calculated by the formula:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

(Arikunto, 2009)

Where,

D : Discriminate index

J : Number of the test participants

J_A : Number of lower group participant

J_B : Number of lower group participant

B_B : Number of upper group participants who answer the question correctly

B_A : Number of lower group participants who answer the question correctly

$$\frac{B_A}{J_A} = \text{ : proportion of upper group students who answer the test item correctly}$$

$$\frac{B_B}{J_B} = \text{ : proportion of lower group students who answer the test item correctly}$$

To interpret the value of discrimination index with the use of distinguishing classification from Arikunto (2009), and it is shown in the table below:

Table 7. Criteria of Discriminate Index

Discriminate Index (D)	Interpretation
< 0.00	Very bad
0.00-0.20	Poor
0.21-0.40	Satisfactory
0.41-0.70	Good
0.71-1.00	Excellent

The result as follows:

Table 8. Discriminate Index

Number	Discriminate Index (D)	Interpretation
2,10,14,15,18,31,34,36, 37,38,42,43,47,50	< 0.00	Very bad
4,6,20,27,32,33,46,49	0.00-0.20	Poor
1,3,11,12,17,28,35,39,40,48	0.21-0.40	Satisfactory
5,7,8,9,19,21,22,23,24,25,26,29, 30,41	0.41-0.70	Good
13,16,44,45	0.71-1.00	Excellent

Based on the table above, there were 14 items in very bad category, 8 questions in poor category, 10 items in satisfactory category, 14 items in good category and 4 items in excellent category.

Level of Difficulty

The level of difficulty according to Masriyah (1999) is expressed in the difficulty index (number of difficulty index) which shows the proportion of students who correctly answered the question. The bigger the index of difficulty, the easier it is. Conversely, the smaller the difficulty index, the more difficult the item is.

The difficulty index of a test item can be calculated by the formula:

$$P = \frac{B}{JS}$$

(Arikunto, 2009)

Where,
 P = Difficulty index of test item
 B = The number of students who answer correctly
 J_s = The number of participants in the test

The classification of difficulty level according to Arikunto (2009):

Table 9. Criteria of Difficulty Level

Index of Difficulty (P)	Difficulty Degree
< 0.00	Very difficult
0.00 – 0.30	Difficult
0.31 – 0.70	Moderate
0.71 – 1.00	Easy
>1.00	Very easy

The result is as follows:

Table 10. Difficulty Level

Number	Level of Different	Difficulty Degree
	< 0.00	Very difficult
3,4,10,11,19,20,25,40,41,42,	0.00 – 0.30	Difficult
2,5,7,8,9,12,13,15,16,17,18,21,22,23, 24,26,29,30,31,35,36,37,38,43,44,45,48,50	0.31 – 0.70	Moderate
1,6,14,27,28,32,33,34,39,46,47,49,	0.71 – 1.00	Easy
	>1.00	Very easy

Based on the result above, there were 10 items that were difficult, 28 items that were moderate and 12 items were easy.

The Recapitulation of The Result of Pilot Test

This research used (25) questions for pre-test as well as post-test. To analyze the result of the data, Anates program will be used.

Table 11. The Recapitulation of Pilot Test

Number of question	Validity	Difficult level	Discrimination
1	Low	Easy	Satisfactory
2	Very Low	Moderate	Very Bad
3	Moderate	Difficult	Satisfactory
4	Very Low	Difficult	Poor
5	High	Moderate	Good
6	Very Low	Easy	Poor
7	Moderate	Moderate	Good
8	Low	Moderate	Good
9	Low	Moderate	Good
10	Very Low	Difficult	Very Bad
11	Low	Difficult	Satisfactory
12	Low	Moderate	Satisfactory
13	Moderate	Moderate	Excellent
14	Very Low	Easy	Very Bad
15	Very Low	Moderate	Very Bad
16	High	Moderate	Excellent
17	Low	Moderate	Satisfactory
18	Low	Moderate	Very Bad
19	Moderate	Difficult	Good
20	Low	Difficult	Poor
21	Moderate	Moderate	Good
22	Moderate	Moderate	Good
23	Moderate	Moderate	Good
24	Low	Moderate	Good
25	Moderate	Difficult	Good
26	Moderate	Moderate	Good
27	Low	Easy	Poor
28	Low	Easy	Satisfactory
29	Low	Moderate	Good
30	Moderate	Moderate	Good
31	Very Low	Moderate	Very Bad
32	Very Low	Easy	Poor
33	Low	Easy	Poor
34	Very Low	Easy	Very Bad
35	Low	Moderate	Satisfactory
36	Low	Moderate	Very Bad
37	Very Low	Moderate	Very Bad

38	Very Low	Moderate	Very Bad
39	Low	Easy	Satisfactory
40	Moderate	Difficult	Satisfactory
41	Moderate	Difficult	Good
42	Very Low	Difficult	Very Bad
43	Low	Moderate	Very Bad
44	High	Moderate	Excellent
45	Very High	Moderate	Excellent
46	Low	Easy	Poor
47	Low	Easy	Very Bad
48	Low	Moderate	Satisfactory
49	Low	Easy	Poor
50	Very Low	Moderate	Very Bad

Based on the recapitulation test, this researcher used 25 questions for pre-test and post-test. There were questions number: 1, 3, 5, 7, 8, 9, 13, 16, 19, 21, 22, 23, 24, 25, 26, 28, 29, 30, 39, 40, 41, 44, 45, 48, 49. Those are based on the result of questions analysis; that the 25 questions were able to measure the students' ability in improving students' vocabulary acquisition and fulfill the indicator of vocabulary acquisition.

Non-test Instrument (Student's Response Questionnaire)

Non-test instrument was given to the students in order to know the students' response toward the lesson and strategy that were used in teaching- learning process. This questionnaire was given after the post test was conducted. The statements in the questionnaire are about Frayer Model and Concept Mapping Strategy in enhancing the students' vocabulary acquisition.

There are four alternate answers in this questionnaire, those are: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD). The completed questionnaire is classified by Arikunto (2012) as follows: The calculation of number of positive responses for each item is on positive items, Strongly Agree (SA), Agree (A), and the negative items, Disagree (D), Strongly Disagree (SD).

1. The Percentage was calculated according to Arikunto (1991) using the following presentation formula as follows:

Table 12. Scoring of Student's Response with Positive Item Type

Alternative Answer	Score
Strongly Agree	4
Agree	3
Slightly agree	2
Disagree	1

For the questionnaire with negative item the scoring reversed, so the criteria are as follow.

Table 13. Scoring of Student's Response with Negative Item Type

Alternative Answer	Score
Strongly Agree	1
Agree	2
Slightly agree	3
Disagree	4

The questionnaire has 10 statements, so the maximum score for the questionnaire is 40 and the minimum score is 10. After the data is obtained, then the percentage of student response were calculated with this formula:

$$R_i = \frac{S_i}{S_{maks}} \times 100$$

R_i = Student i response score

S_i = Total of score item of student

S_{max} = Maximum score

Table 14. Interpretation of students' Response

Degree in Percentage	Interpretation
$80 \leq t \leq 100$	Very Good
$60 \leq t \leq 80$	Good
$40 \leq t \leq 60$	Moderate
$20 \leq t \leq 40$	Bad
$t \leq 20$	Very Bad

Statistical Treatment

The researcher used Statistical Package for Social Science (SPSS) to analyze the data. SPSS is a computer program for statistic computation. The level of significance $\alpha = 0.05$.

Normalized Gain

To determine the improvement of students' vocabulary acquisition, the researcher performed an analysis on the results of the pre-test and post-test.

Analyzing will be performed using Normalized Gain.

$$g = \frac{\%posttest - \%pre - test}{100\% - \%pre - test}$$

(Hake, 1999)

Where,

g: average normalized gain

% pre-test: percentage of pre-test scores

% post-test: percentage of post-test scores

Table 15. The Criteria of Normalized Gain

Gain (g)	Category
$0.71 < g \leq 1.00$	High
$0.31 < g \leq 0.70$	Moderate
$0.00 \leq g \leq 0.30$	Low

(Hake, 2007)

Normality Test

Normality test was conducted to see whether the population of the data collected from is normally distributed or not. To test the normality of the population the researcher used the Kolmogorov-Smirnov test.

Because according to Santoso (2007), Kolmogorov-Smirnov is more accurate than any other test for testing normality.

The formula is: $W = \frac{(\sum a_i x_i)^2}{\sum (x_i - x)^2}$

(Ruseffendi, 1998)

Where,

W : Test statistic

x_i : statistic order $X_1, X_2, X_3, \dots, X_n$

a_i : Constant generated from the average value (mean), variance, and covariance structure sample distribution of and from a normal distribution.

x : Mean sample data

The Hypothesis will be as following:

H₀: The data population is normally distributed

H_a: The data population is not normally distributed

The Criteria of Normality Test if the Data is Analyzed with SPSS:

- Data is normally distributed if sig. value is larger (>) than α (0.05), or *H₀* is not rejected.

- b. Data is not normally distributed if sig. value is lesser or equal (\leq) or α (0.05), then H_0 is rejected.

Homogeneity Test

To determine whether the population variances are homogeneous or not which means having the same basic qualities, the researcher used the homogeneity test based on the result of normality test.

The formula: $F = \frac{S_2^1}{S_2^2}$

(Uyanto, 2009)

Where,

F : value (variance variable data)

S_2^1 : the larger variance

S_2^2 : the smaller variance

The hypothesis that will be used are:

H_0 : The population variances are homogeny

H_a : The population variances are not homogeny

The Criteria of Homogeneity test if the data is analyzed with SPSS:

- The population variances are homogeny if sig. Value $> \alpha$ (0.05), then H_0 is not rejected.
- The population variances are not homogeny if sig. Value $\leq \alpha$ (0.05), then H_0 is rejected.

Different Mean Pre-Test and N-Gain

The significant value will be using either T-Test or U-Test to determine if there is significant difference or not between both data (Different mean test).

This step will be used to answer the second statement for the statement of the problem. If two populations are homogeneous, then the statistics that the researcher will use is the 2 sample T-test with the formula:

$$t = \frac{x_1 - x_2}{SD \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad \text{with } SD = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

(Supranto, 2009)

Where,

x_1 = Mean score for Frayer Model

x_2 = Mean score for Concept Mapping Strategy

n_1 = Frayer Model sample size

n_2 = Concept Mapping Strategy sample size

S_1 = Standard deviation of Frayer Model

S_2 = Standard deviation of Concept Mapping Strategy

However, if the data is not homogeneous, then the two-different test average used is a non-parametric test or Mann-Whitney, with formula:

$$U = n_1n_2 + \frac{n_2(n_2 + 1)}{2} - \sum_{i=n_1+1}^{n_2} R_i$$

(Supranto, 2009)

Where:

U = Mann-Whitney U test

n_1 = sample size one

n_2 = Sample size two

R_i = Rank of the sample size

The Hypothesis of Different Mean Test will be as follows:

Ho: There is no significant difference in the vocabulary enhancement between those who are taught Frayer Model and those who are taught Concept Mapping Strategy.

Ha: There is significant difference in the vocabulary enhancement between those who are taught Frayer Model and those who are taught Concept Mapping Strategy.

The Criteria of Different Mean test if the data as analyzed with SPSS:

- Ho is not rejected if the sig. value $> \alpha$ (0.05), means that there is no significant difference in the enhancement of vocabulary enhancement in SMAN 1 Parongpong.
- Ho is rejected if the sig. value $\leq \alpha$ (0.05), means that there is significant difference in the enhancement of vocabulary enhancement in SMAN 1 Parongpong.

RESEARCH RESULTS AND DISCUSSION

Analysis

The result of pre-test and post-test of each group was calculated through excel and SPSS.

It can be seen in the following table:

Table 16. Pre-Test, Post Test, Standard Deviation, and Normalized Gain

	Frayer Model		Concept Mapping Strategy	
	Mean	St. Deviation	Mean	St. Deviation
Pre-Test	30.50	10.155	33.40	13.513
Post Test	87.00	5.023	84.40	4.419
Normalized Gain	.8162	.06052	.7631	.06020

It can be seen from the table above that the mean pre-test of Frayer Model is 30.50 with Std. Deviation 10.155 and the mean for Concept Mapping Strategy is 33.40 with Std. Deviation 13.513. It becomes the answer for research question number one. Then the mean Post-test of Frayer Model is 87.00 with Std. Deviation 5.023 and mean for Concept Mapping Strategy is 84.40 with Std. Deviation 4.419. It can be concluded that the initial score for both classes are quite high.

The mean gain of Frayer Model is 0.8162 and for Concept Mapping Strategy is 0.7631, it can be concluded that the knowledge of both classes has enhanced in constructing the Vocabulary acquisition.

Normality Test of the Normalized Gain

The Normality test has a function to see whether the data is normally distributed or not. Ho is accepted if p value was > 0.05 and Ho is rejected if p value was < 0.05 . The researcher conducted normality test for the result of the gain score. The result can be seen on the table below.

Table 17. Result of Normality Test of Normalized Gain

Group		Shapiro-Wilk		
		Statistic	Df	Sig.
GAIN	3	.105	40	.200
	4	.104	40	.200

Based on the table, it can be concluded that the population of the data is normally distributed for both classes, it is because the significant value of FM is $0.200 > \alpha (0.05)$ and the significant value CMS is $0.200 > 0.05$.

Homogeneity Test of the Normalized Gain

To see the homogeneity of population variances, homogeneity was done. The result can be seen on the table below:

Table 18. Independent sample t-test

	Levene's Test for Equality of Variances		T	Df	Sig.(2-tailed)
	F	Sig.			
Gain	.508	.478	3.931	78	.000

Equal variances assumed			3.931	77.998	.000
Equal variances not assumed					

Since the data of gain was normally distributed and homogeny. The significant value based on mean $0.478 > 0.05$, so it means that the population variance is homogeny.

Table 19. Independent Sample Test

	Levene's Test for Equality of Variances		T	Df	Sig.(2-tailed)
	F	Sig.			
Gain	.508	.478	3.931	78	.000
Equal variances assumed			3.931	77.998	.000
Equal variances not assumed					

Since the data of gain was normally distributed and not homogeny, then based on the table above the result of t-test showed that the sig (2-tailed) was $0.000 < 0.05$ based on the hypothesis that meant (H_0) was rejected and (H_a) was accepted. Thus, there was a significant difference between students who were taught using Frayer Model and those were taught using Concept Mapping Strategy.

Questionnaire

The additional data required for the present study were collected through administering questionnaire to the subjects in order to know their response toward Frayer Model and Concept Mapping Strategy. The results are explained in the table below:

Table 20. FM Questionnaire

Subject	SA	A	D	SD	Total Skor	(Total Score/40)x100	Interpretation
1	24	9	0	1	34	85	Very Good
2	16	15	0	1	32	80	Very Good
3	0	21	6	0	27	67.5	Good
4	8	18	2	1	29	72.5	Good

5	32	3	0	1	36	90	Very Good
6	20	9	2	1	32	80	Very Good
7	20	6	4	1	31	77.5	Good
8	0	24	0	1	25	62.5	Good
9	32	3	2	0	37	92.5	Very Good
10	28	6	2	0	36	90	Very Good
11	32	3	0	1	36	90	Very Good
12	20	12	0	1	33	82.5	Very Good
13	32	3	0	1	36	90	Very Good
14	4	24	0	1	29	72.5	Good
15	28	6	2	0	36	90	Very Good
16	4	24	0	1	29	72.5	Good
17	4	21	4	0	29	72.5	Good
18	20	12	0	1	33	82.5	Very Good
19	8	21	0	1	30	75	Good
20	32	3	0	1	36	90	Very Good
21	4	21	4	0	29	72.5	Good
22	8	21	2	0	31	77.5	Good
23	4	24	0	0	28	70	Good
24	0	24	4	0	28	70	Good
25	20	12	0	1	33	82.5	Very Good
26	0	27	2	0	29	72.5	Good
27	32	0	2	1	35	87.5	Very Good

28	0	24	2	1	27	67.5	Good
29	16	9	2	1	28	70	Good
30	12	18	0	1	31	77.5	Good
31	20	12	2	0	34	85	Very Good
32	24	9	0	1	34	85	Very Good
33	0	24	4	0	28	70	Good
34	32	0	2	1	35	87.5	Very Good
35	0	24	4	0	28	70	Good
36	12	15	4	0	31	77.5	Good
37	32	0	2	1	35	87.5	Very Good
38	0	24	2	1	27	67.5	Good
39	16	12	2	1	31	77.5	Good
40	12	18	0	1	31	77.5	Good

Table 21. The Result of FM Questionnaire

Percentage	Degree in Percentage	Interpretation
45	$80 \leq t \leq 100$	Very Good
55	$60 \leq t \leq 80$	Good
0	$40 \leq t \leq 60$	Moderate
0	$20 \leq t \leq 40$	Bad
0	$t \leq 20$	Very Bad

From the table above, it is concluded that the mean percentage of students' response in class FM is calculated as the sum of percentage of students' response divided by the number of respondents, the result is 55, that can be categorized as "Good".

Table 22. CMS Questionnaire

Subject	SA	A	D	SD	Total Score	(Total score/40)x100	Interpretation
1	4	18	6	0	28	70	Very Good
2	12	15	2	1	30	75	Very Good
3	0	21	4	1	26	65	Good
4	0	27	2	0	29	72.5	Good
5	20	9	4	0	33	82.5	Very Good
6	0	21	4	1	26	65	Good
7	8	21	2	0	31	77.5	Good
8	12	15	2	1	30	75	Good
9	0	21	6	0	27	67.5	Good
10	4	15	8	0	27	67.5	Good
11	0	24	4	0	28	70	Good
12	0	24	4	0	28	70	Good
13	4	21	2	1	28	70	Good
14	0	24	4	0	28	70	Good
15	0	24	4	0	28	70	Good
16	16	15	0	1	32	80	Good
17	8	21	0	1	30	75	Good
18	0	24	2	1	27	67.5	Good
19	20	9	2	1	32	80	Good
20	8	18	2	1	29	72.5	Good
21	0	24	2	1	27	67.5	Good
22	4	21	4	0	29	72.5	Good
23	12	18	2	0	32	80	Good
24	0	18	8	0	26	65	Good
25	0	12	10	1	23	57.5	Moderate
26	12	9	8	0	29	72.5	Good
27	0	21	6	0	27	67.5	Good
28	4	18	6	0	28	70	Good
29	0	18	6	1	25	62.5	Good
30	4	18	6	0	28	70	Good
31	16	15	2	0	33	82.5	Very Good
32	0	24	2	1	27	67.5	Good
33	16	12	2	1	31	77.5	Good
34	12	18	0	1	31	77.5	Good
35	20	12	2	0	34	85	Very Good
36	8	21	0	1	30	75	Good
37	32	3	0	1	36	90	Very Good
38	8	21	0	1	30	75	Good

39	32	3	0	1	36	90	Very Good
40	4	21	4	0	29	72.5	Good

Table 23. The Result of CMS Questionnaire

Percentage	Degree in Percentage	Interpretation
17.5	$80 \leq t \leq 100$	Very Good
80	$60 \leq t \leq 80$	Good
2.5	$40 \leq t \leq 60$	Moderate
0	$20 \leq t \leq 40$	Bad
0	$t \leq 20$	Very Bad

Based on the result of the CMS questionnaire, the mean percentage is 80 which means the response of CMS group is “Good”. From the data above, it can be said that most of the students from both classes agreed for the implementation of FM and CMS strategy in enhancing their vocabulary acquisition. From the responses of the students’ data analysis and the discussion, it can be concluded that there is a significant difference between those who were taught using Frayer Model and those who were taught using Concept Mapping Strategy. Students in both classes enjoyed the strategies.

DISCUSSION OF THE RESEARCH FINDING

From the result of the data, the initial knowledge of students in FM group is 30.50 and in CMS group is 33.40. It is also known that there is a significant difference on students between those who were taught through Frayer Model and Concept Mapping Strategy. From the result of normalized gain, it can be seen that the students who are taught using FM got 0.8162 and those who are taught using CMS got 0.7631. So, it can be said that both treatments are applicable in teaching vocabulary acquisition and it showed that both strategies enhanced the students’ vocabulary acquisition.

The response of both classes also showed that they enjoyed learning English, which was proven by the results of the questionnaire from both classes are 55 and 80 which are categorized as “Good”.

For additional explanation, in doing this study the researcher should do the treatment for both models at the same period of lesson. Unfortunately, because of the English lesson timetable at SMA Negeri 1 Parongpong did not match with the researcher’s timetable where the available timetable to do this study was only one class in the morning and one class in the late afternoon. Consequently, the researcher agreed to do the research at different time of lesson where the Frayer model was held in the morning while the Concept mapping strategy was held in the late afternoon. The time of lesson did greatly affect to the success of the method itself. Based on the result, the Frayer Model has a significant difference in vocabulary acquisition rather than the Concept Mapping Strategy.

CONCLUSION & RECOMMENDATION

After interpreting the data, the researcher concluded that there is a significant difference between students who are taught using Frayer Model and students who are taught using Concept Mapping Strategy.

In relation to the conclusion above, the researcher gives several recommendations:

For Teachers: It is recommended for English teachers to use Frayer Model in teaching vocabulary acquisition especially in senior high school, because it is proven by the researcher that the students can describe the characteristics, provide examples of the idea and suggest non examples of the idea, and use critical thinking skills. Therefore, students' vocabulary acquisition was increased after using Frayer Model.

For Students: It is recommended to learn English vocabulary using these methods, because they are interesting methods and are already proven that the students can understand words meaning appropriately and have a good grammar of word. So, they got improvement in their vocabulary acquisition.

For Institution: The institution of SMAN 1 Parongpong, the researcher would like to suggest to increase the quantity of teaching and learning facilities such as more books on learning vocabulary acquisition in the library.

For Future Researchers: The researcher hopes that the results of this study can be used as additional references for future researcher about using Frayer Model in high schools in different levels and contexts.

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