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The Application of Frayer's Model on Teaching Reading Comprehension in EFL Classroom at the University Level

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Abstract

This study firstly aims to find out the effect of applying Frayer's Model as a teaching strategy on students' comprehension in reading passages. It has been hypothesized that there is no significant differences between the mean scores of the control and experimental groups at the post test in reading comprehension. The second aim is to find out the effect of Frayer's Model on male and female students 'performance' in reading comprehension. The second hypothesis has been derived as there is no statistically significant difference between the male and female mean scores in reading comprehension. This study is limited to the academic year 2023-2024, students of third year at College of languages and Human Sciences at Garmian University . After collecting data and analyzing them statistically, some conclusions have been drawn.

تطبيق انموذج فراير في تدريس مادة استيعاب القراءة في صفوف اللغة الإنجليزية كلغة أجنبية على المستوى الجامعي

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ملخص البحث

تهدف هذه الدراسة أولاً إلى معرفة تأثير تطبيق نموذج فراير كاستراتيجية تدريس على استيعاب الطلبة في نصوص القراءة. وقد افترض أنه لا توجد فروق ذات دلالة إحصائية بين متوسط درجات المجموعتين الضابطة والتجريبية في الاختبار البعدي في استيعاب قراءة النصوص . والهدف الثاني هو معرفة تأثير نموذج فراير على "أداء" الطلاب والطالبات في فهم القراءة. وقد تم اشتقاق الفرضية الثانية على انه لا يوجد فرق ذو دلالة إحصائية بين متوسط درجات الذكور والإناث في استيعاب النصوص. اجريت هذه الدراسة على العام الدراسي ٢٠٢٣-٢٠٢٤، وطلبة المرحلة الثالثة في كلية اللغات والعلوم الإنسانية بجامعة كرميان. وبعد جمع البيانات وتحليلها إحصائيًا، تم استخلاص بعض الاستنتاجات.

1. Introduction

It is worth mentioning words are building blocks of meaningful communication, which makes them very significant in terms of languages and communication when the point is foreign language learning and teaching (Demir, 2017,p.24). A language with rich word environment is one which gives students opportunities to read, use, hear, and talk about new and varous vocabularies. Naturally, these environments contain books and other materials . To understand a sentence or text, one must understand the words representing the ideas or concepts (Dalton & Grisham, 2011,p.308). Taylor& MacKenney (2008) assert that students tend to understand some concepts better when they are related to other concepts of which they know and when positive and negative examples are given simultaneously.

In EFL classrooms, the main problem is that EFL students have difficulties memorizing words and acquiring concepts, because the EFL teacher's techniques used in teaching vocabularies involve looking for

unfamiliar words in a dictionary and memorization of word definitions, these typical habits sometimes do not result in good word learning when used alone, after finding the words students forget them and confuse between words because of the lack using examples and non-examples.

Another problem is that EFL instructors use the traditional methods in teaching English and staying away from the use of models in most cases. This matter may be due to the lack of teachers following up on developments in the field of education, it has a negative role reflected on students' acquisition of concepts, and this is an evidence of the students' low levels of achievement.

This study firstly aims at finding out the effect of Frayer's Model on students' reading comprehension. The second aim is to find out the effect of Frayer's Model on male and female students' performance in reading comprehension. It is hypothesized that there is no significant differences between the mean scores of the control and experimental groups at the post test in reading comprehension. The second hypothesis is that there is no statistically significant difference between the male and female mean scores in reading comprehension.

This study is limited to the academic year 2023-2024, second year students of College of languages and human sciences at University of Garmian, reading comprehension.

The sample of the current study is selected randomly from second year students English department at college of languages and human sciences. The selected sample are divided into control and experimental groups to apply the experimental design. Students of control group are taught by conventional method, while students of experimental group are taught according to Frayer's model.

2. Theoretical Background

2.1 Frayer's Model

The background of Frayer Model was founded by Dorothy Frayer together with her colleagues Frederick and Klausmeier in (1969) at the University of Wisconsin(Estacio& Martinez, 2017:38). Frayer Model is known for its versatility across content domains, the Frayer Model does not emerge or originate as a graphic organizer, but as a seven-steps process to analyze and test concept attainment (Greenwood, 2002).

Ilter (2014,p. 756) defines Frayer's Model as a strategy based on cognitive process, which offers students' knowledge to a long term memory, also assists them in creating semantic maps by rebuilding new meanings for words.

Frayer's Model is a vocabulary building approach that allows students to define target vocabulary, gives characteristics and applies their knowledge by generating examples and non-examples to explain the meaning of the word. Then placed this information on a chart (graphic organizer) which is divided into four parts to present a visual representation for students (Hale, 2017,p. 11).

It means the steps that allows the students to develop their ability of vocabulary building or other skill . This can be practiced by using a model that students go through as they work with the target knowledge through reading skill.

Greenwood (2010,p.76) asserts that Frayer and her colleagues (Frederick & Klausmeiser) originally outlined many steps procedure as follows:

1. Give the word and name its relevant attributes.
2. Discriminate the relevant from the irrelevant properties of the concept.
3. Give an example of the concept.
4. Give a non-example of the concept.
5. Relate the concept to a subordinate concept.
6. Relate the concept to a coordinate term.

Early research on the Frayer‟s Model did not involve a graphic organizer, as is commonly used today. Later, this original model was developed for broader use in direct vocabulary instruction. The adaptation reduced the framework to six steps (Hale, 2017,p. 25).

Greenwood (2010) has provided a more manageable and student-friendly various steps modification of Frayer's Model as follow:

1. Define the concept and give its essential attributes.
2. Distinguish between the concept and similar concepts.
3. Give examples and explain why they are examples.
4. Give non-examples and explain why they are non-examples.
5. Ask students to distinguish between other examples and non-examples

given by the teacher, and explain why they are examples or non-examples
6. Ask students to present their own examples and non-examples, and discuss why they are examples or non-examples.

Monroe & Pendergrass (1997) adopt two models of vocabulary instruction, an integrated graphic organizer/discussion model and a definition-only model on the mathematical vocabulary. The integrated model combined a modified Concept of Definition graphic organizer with Frayer' discussion model, while the definition only requires students to write definitions of vocabulary after oral review. Eventually, the revised six steps of Frayer's Model are incorporated into a four square graphic organizer as shown in figure (1).

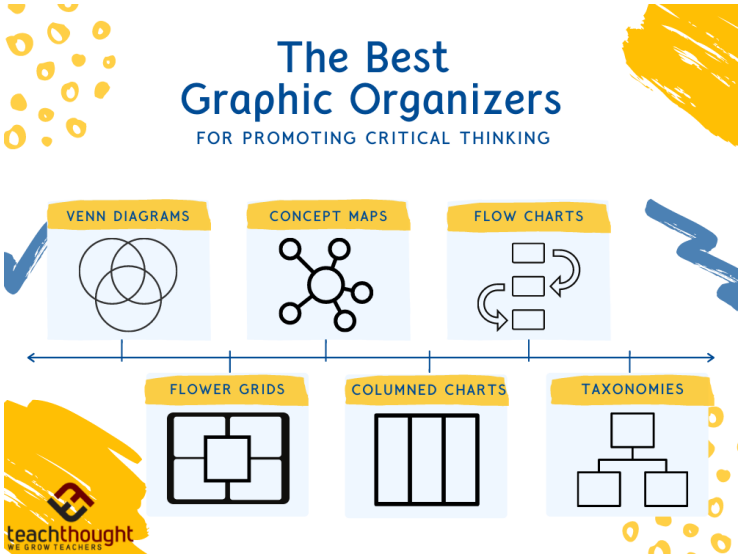

Figure (1) Graphic Organizer

Current applications of the Frayer's Model as a graphic organizer involve a four- square layout, two cognitive theories of learning fit with this format. The first, schema theory, contends that knowledge is stored in a framework of categories or schemata. Understanding a category's attributes enables a learner to organize new information and form relationships among schemata. The second cognitive theory of learning that underlies the Frayer's Model is linked to the use of verbal and visual representations of attributes that discriminate examples from non-examples dual coding theory (Reed et al., 2018,p.4).

Dorothy Frayer's research in cognitive psychology contributed to develop this beneficial strategy for directing students' concept learning. Her work is related to the earlier work of Jerome Bruner and others who saw concept attainment as a process of defining the concept in terms of its essential attributes, identifying characteristics of the target concept and distinguishing examples that have similar attributes from those that do not (Nessel & Graham, 2007).

The memory system, with its short and long term sorting and encoding elements, is supposed to direct the learning process, according to cognitive learning theory. Learning is the best attained when the information is presented systematically and stored in the student's brain in an organized, meaningful and functional way (Zaini et al., 2010).

Ajayi (2018) asserts the importance of graphic organizers and modeling in English language teaching since he introduces his theory of multiple intelligences , it allows teachers to integrate various learning modalities into the classroom to appeal to students' learning preferences.

Greenwood (2019) debates that students possess several kinds of minds and therefore learn, remember and understand in many ways. Lifetime has been developed and it is theorized that learners have at least eight distinct intelligences that can develop learners. The eight types of intelligences are: verbal-linguistic, logical-mathematical, visual-spatial, bodily kinesthetic, musical-rhythmic, interpersonal, intrapersonal, and naturalist intelligences (Freeman& Anderson, 2011). So, graphic organizers have emerged as one of the most effective resources which teachers utilize to help students employ their visual intelligence in the learning process (Ajayi, 2018).

2.2 Graphic Organizer

A graphic organizer consists of spatial arrangements of words (word groups) intended to perform the conceptual organization of text. This definition combines of three parts: (a) Elements in a graphic organizer are word groups (b) relations among elements are indicate by the spatial arrangement of the elements on the page, and (c) the graphic organizer represents the conceptual organization of a text (Stull& Mayer, 2007). Graphic organizers can be considered as tools for displaying information in originative and picturesque ways using drawings so that the information can be remember and understood easily. Graphic organizers have various names, they are sometimes called, story map, semantic map, visual organizers, outline, semantic feature analysis, spider map, semantic web and charts of various kinds (Dau, 2015).

Graphic organizers have been categorized by both structure and function. The structure category contains: Webbing, Concept Mapping, Matrix, Flow Chart, whereas the function category consists of: Describing, comparing & contrasting, classifying, sequencing, causal, decision making (Sam & Rajan, 2013).

National Reading Panel (2000) analyzes various studies on instruction of text comprehension. From that eight instructional strategies offered a firm basis for concluding their improve comprehension. One of the eight strategies listed as useful in improving comprehension was using various organizers. EFL teachers should explore spatial instructional strategies to enhance learning and instruction. The graphic organizer strategy can be used in teaching vocabulary, among other courses to EFL students (Al -Hinnawi, 2012). As information is processed and stored in memory in both linguistic and visual forms, such as graphic organizers could help students organize and spatially represent both what they know and what they are thinking (Guler, 2018). The major structure of an organizer has circles or boxes, or both, with connecting lines that can represent visually, how ideas link with one another and how words can be described and classified. Typical examples are word maps, and the Frayer model word cards (Sullivan 2014).

According to Gil-Garcia & Villegas (2003,p.5) present types of Graphic Organizer in six different pattern which are; hierarchical, conceptual, sequential, evaluative, relational and cyclical.

2.3 Reading Comprehension

One of the crucial and practical skills for language learners is the reading comprehension because it involves a wide variety of vocabularies and it needs learners to use their mental and cognitive skills.

Some theorists look at reading comprehension as working on two levels of complexity, namely literal and inferential level. Among them are Wyse et al. (2013) who distinguish between literal and inferential level of comprehension. They argue literal level is achieved when text comprehension occurs at a surface level, whereas in inferential level, readers can engage deeply with the text and grasp "nuances implied" but not explicitly stated by the text.

Sayhood (1988) contends that details, character traits, and cause and effect relationships are the objectives of literal level of comprehension. Aryadoust and Fox (2016) state that questions of reading comprehension at literal level tap into the reader's literal comprehension ability and ask what the writer states.

Considering inferential level, it demands the reader to make guessing about ideas, information and events that are stated implicitly in the text For instance, the reader has the ability to infer that the main character is angry from what he says or what he does(Jones, 2010).

Brassell and Rasinski (2008) claim that inferring is more complex than literal level since inferential level requires manipulation of information from the text in addition to reader"s background knowledge. In line with Brasell and Rasinski"s argument, Aryadoust and Fox (2016) confirm that inferential level questions require integration of text-based and knowledge-based processes including various levels presentations of text and its content.

2. 4 Previous Related Studies

2.4.1 Umi (2020)

The aim of this study was to examine whether there was a significant difference between students' vocabulary mastery who were taught by Frayer's Model Strategy and those who were not taught by Frayer's Model Strategy at Nawangan. The sampling of the research was cluster random sampling. From the population, two classes were taken randomly as the sample, where each class involves 33 students.

The result of this research showed that there was a significant difference between students' vocabulary mastery who were taught by Frayer Model Strategy and those who were not taught by Frayer Model Strategy at SMAN Nawangan.

2.4.2 Azizah (2023)

The objective of the study is to find out whether Frayer's Model improve the students vocabulary mastery or not. The sample was selected through purposive sampling. The researcher selected two classes to represent experimental class and control class out of four population classes. Each group involves twenty students. Study instrument used is designed to measure students' vocabulary achievement. Pre -posttest experimental design is applied to identify the effect of instructional method on improvement of vocabulary. The conclusions of this study indicate that teaching English using the Frayer's model is more successful than using a conventional method.

2.4.3 Discussion of Previous Studies

Umi's (2020) Objective is to examine if there was a significant difference in students' vocabulary mastery between those taught with the Frayer Model Strategy and those who were not. While Azizah's (2023) Objective is to determine whether the Frayer Model improves students' vocabulary mastery.the objective of the present study is to find out the effect of Frayer's model on students' reading comprehension

Concerning the Method of Umi (2020) Cluster random sampling was used, with two classes (33 students in each) randomly selected from the population. Azizah (2023) used purposive sampling to select two classes, one as the experimental group and the other as the control group, each with 20 students. A vocabulary exam, including a pre-test and post-test, was used to measure vocabulary achievement. The present study used experimental sedign with experimental control groups 25 students for each one.

The findings of Umi (2020) show a significant difference in vocabulary mastery between students taught with Frayer Model Strategy and those who were not, indicating the strategy's positive impact on vocabulary learning. Through the findings of Azizah (2023) the study concludes that teaching English with Frayer's Model was more effective in improving students' vocabulary mastery than using conventional methods.

Both studies emphasize the effectiveness of Frayer's Model in improving vocabulary mastery in students.

3. Methodology

3. 1 The Experimental Design

The experimental design of the present study is a quasi – experimental control groups design. Two groups are specified to apply the experiment where the experimental group is taught by using Frayer's model steps, and control one is taught by conventional method. Students age by months is calculated of the two groups then they have been compared to each other to find out if there is any difference between students of the two group concerning the factor of age , parents attainment ,and students' academic level. It has been found out that the two groups are equivalent through taking in consideration the mentioned factors of equalization that have been examined in different types of experimental studies to ensure students' equivalence (Best & Khan, 2010).

3.2 Sample and Population

The population of the present study are college students of English department in Garmian University. The sample of the study who are chosen randomly are 50 students of second year in English Department in the academic year 2023-2024. Each group involves 25 students.

Table (3.1) The Sample of the Study

Population & Sample		**Groups**	**Sections**	**Number**
Population	**137**	Experimental	A	25
Sample	**50**	Control	C	25
percentage	**36.49 %**	Total	/	50

3.3 The Tool of the Study

A pre-test is constructed to ensure of students' academic level before applying the experiment to equalize students level (Best & Khan , 2010). It involves three questions of unseen reading passages

On the other hand a post-test has been constructed to be applied on the sample of the study after being treated by using Frayer's model as a teaching strategy. The posttest last version is modified and reconstructed according the opinions of the jury members who are specialized in teaching English as a foreign language.

3.4 Validity of the Posttest

Face validity of the study instrument has been achieved through giving the test to experts at the English departments at different universities(Best & Khan,2010). The experts write their suggestions and valuable advice to be taken in consideration that enrich the post test. The agreement of opinions among the jurors was 98% concerning the items of the posttest of the present study.

3.5 Pilot Study

A pilot study has been prepared and achieved before the start of the experiment for many reasons. It is useful to estimate the time where it was from (60-100) minutes, the other useful matter is to know the difficulty level of the test where the calculated scores were from (0.30 - 0.75) . The third benefit of achieving the pilot study is to calculate discriminating power where the score of the items are between(0.28-0.68) . All of these scores show that the test items are acceptable concerning their difficulty level and discriminating power.

3.6 Reliability of the Posttest

There are different techniques and methods to calculate reliability of the test. Alfa Chronbach is used to measure reliability of the posttest in this study. It is found to be 0.81 which is acceptable value.

3.7 Instructional Material

Through the experiment it has been used different steps of the adopted model of Frayer through teaching the reading passages of student academic syllabus of the ministry of Education. Moreover , various selected unseen passages are adopted to be exposed from time to time to learners. Both groups are subjected to the same instructional material but by using different steps of teaching method according to the teaching method.

3.8 Steps of Frayer Model

Greenwood (2010) mentions the following steps which are adopted to be practiced for teaching students, as follows:

experimental group ,:

1. Student are asked to present a word and name its relevant attributes.
2. Trying to discriminate the relevant from the irrelevant functions of the concept.
3. Students can give an example of the concept.
4. Try to find a relationship between the concept and a subordinate concept.
5. connect the concept to a superordinate concept.
6. Relate the concept to a coordinate term.
7. Match the concept to any other concept found in the reading passage

3.9 Statistical Means

Statistical means used for the purpose of analyzing data as follows"

1- Chi squired is used to check the equivalence of students age in months.
2- T-test for two independent samples to find out the differences among students of control and experimental mean scores.
3- Cronbach's Alpha to identify the reliability of the study instrument.
4- Percentage to identify face validity of the post test.

4. Data Analysis

4.1 Data Analysis Related to the First Aim of the Study

To achieve the aim of the study namely finding out the effect of Frayer's Model Strategy on students 'reading comprehension', the following hypothesis "there is no statistically significant difference between the experimental group's mean scores and the control group's mean scores in reading comprehension" , has been tested.

After the application of the posttest then collecting data and analyzing them statistically it has been found out that the mean score of the experimental and control group, as follows in table (4.1):

Table (4.1)
Mean Scores, T-Value and SD of the Experimental and Control Groups

Group	Mean	SD	T-test value		Degree of freedom	Significance
			C .value	T . value		
Experimental	31.3	5.65	3.95	2.00	48	0.05
Control	19.4	3.72				

The T-test formula of two independent samples has been used to calculate students‟ scores in reading comprehension of the post achievement test. After collecting data and analyzing them statistically it has been found out that the experimental Group students ‘mean score is (31.3), while the Control group students‟ mean score is (19.4). The calculated T value is (3.95), while the tabulated T- value (2.00) under degree of freedom (48) at 0.05 level of significance. The first hypothesis is rejected since it has been found out there are significant differences between the mean score of the students of experimental and control group.

4.2 Data Analysis Related to the Second Aim

To achieve the second aim namely finding out the effect of Frayer's Model Strategy on male and female students 'performance' in reading comprehension, the second hypothesis "there is no statistically significant difference between the male and female mean scores" , has been tested. The formula of T-test of two independent samples has been used to calculate students level in written items of the post achievement test. After collecting data and analyzing them statistically it has been found out that the Male students' mean score of the experimental group is (29.5) and SD (5.6), while the female students' mean score is (21.33) and SD (6.1). It is found out that the calculated T-value is (2.39), while the tabulated T- value (2.00) under degree of freedom (48) at 0.05 level of significance. The second hypothesis is rejected since it has been found significant differences between the mean score of male and female students, as mentioned in table (4.2).

Table (4.2)
Mean Score, T-test and Standard Deviation of Students' Performance in the Written Test Items

Group	Mean	SD	T-test value		Degree of freedom	Significance
			C .value	T . value		
Male	29.5	5.6	2.39	2.00	48	0.05
Female	21.3.3	6.1				

4.3 Discussions of Results

The improvement in reading comprehension levels among students in the experimental group indicates that this teaching method is impactful and considered professional and successful in helping students understand the ideas presented in any reading text. This conclusion stems from the concepts taught through the techniques incorporated in Frayer's Model.

Furthermore, statistical analysis of the data revealed that male students performed better than female students. This suggests that male students are more influenced by this method, likely due to psychological factors. Specifically, male students tend to explain and simplify complex issues logically, which may require more time than female students typically need. In this context, it can be inferred that the steps of Frayer's Model are better suited to male students than female students.

When students indulge through the steps of Frayer's Model their level gets raised because : through the first step students understand the key characteristics that define a concept, while by the second step students develop critical thinking by distinguishing important features from unimportant ones; according to the third step they can gain a concrete understanding by seeing how the concept applies in real life, then fourthly they can clarify boundaries and avoid misconceptions by understanding what the concept is not; at the fifth step they can see how concepts fit into a hierarchy, deepening their understanding of related ideas; and finally students make connections between similar concepts, helping to organize their knowledge.

In addition, the application of Frayer's Model encourages active student engagement and critical thinking. By focusing on categorization and contextual understanding, students are not only able to internalize vocabulary but also connect it with broader concepts, fostering deeper cognitive processing. This holistic approach not only enhances reading comprehension but also promotes long-term retention of language structures. Therefore, educators might consider adopting this model to facilitate both immediate and sustained language acquisition in diverse student populations.

Concerning the comparison between the findings' of previous studies and the present one , the previous studies found out that Frayer Model is a sufficient teaching strategy to master vocabulary learning by EFL . The current study shows that Frayer's Model is an effective strategy for teaching reading comprehension.

5. Conclusions

The following conclusions have been drawn according to the findings of the study:

1- Frayer's Model as a teaching strategy shows its enhancement to college level students by making learning active, more enjoyable, and engaging. The experimental group which is taught using Frayer's Model approach performs better on the achievement test than the control group which is taught using conventional approaches.
2- Using Frayer's Model as assessment tool for learning to check students comprehension in reading texts since it require students to respond by using simple self-expressions .
3- Applying Frayer's Model assists male students to become strategic problem solvers for different situations through reading comprehension , rather than female students.
4- Practicing used in Frayer's Model enhances students 'thinking skill' . Through the graphic organizer, the students can organize their thoughts and process the information in the question. Also, it can improves college students' recall of word and meaning in reading comprehension.
5- Frayer's Model is systematically directed by simple steps that can be used by instructors to go deeper through text concepts and it facilitates the role of teacher.

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