

Digital Frayer Model as a Pedagogical Tool to Tackling EFL students' Unfamiliar Vocabulary in Reading Comprehension

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نموذج فراير الرقمي كأداة تعليمية لمعالجة المفردات غير المألوفة لدى طلاب اللغة الإنجليزية لغة أجنبية في فهم القراءة

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Abstract

Through teaching reading comprehension, the researcher found that there is a problem among second-year students, which is that the students face difficulty in mastering vocabulary. Therefore, the researcher interests in implementing the Frayer Model in teaching vocabulary to develop their vocabulary. Since, this model helps to enhance their understanding of unfamiliar vocabulary by knowing and distinguishing what something is and what something is not. This study explores the effect of digital Fryer model as a pedagogical tool to tackling EFL students' unfamiliar vocabulary in reading comprehension. The sample involves (64) EFL students second stage from department of English, College of Education for Women, at Tikrit University. The study lasted for two months in 2023-2024 Academic Year. The study consists of two groups; experimental and control group with (32) students for each group. At the beginning, a pretest was administered to find out the overview of students' level in English language. During the processing, students in experimental group exposed to use digital Frayer model and in control group they used traditional method. Depending on collected data by post-test in reading, it was discovered that the findings the experimental group who was exposed to digital Fryer model great than those results in control group who was exposed to traditional method. This refers that the experimental group outperformed the control group which appears in the results of reading test that was administered to them.

Keywords: Digital, Frayer Model, Pedagogical Tool, reading comprehension, complex concepts.

المخلص

من خلال تدريس فهم القراءة وجد الباحث أن هناك مشكلة لدى طلاب السنة الثانية وهي أن الطلاب يواجهون صعوبة في إتقان المفردات لذلك اهتم الباحث بتطبيق نموذج فراير في تدريس المفردات لتطوير مفرداتهم حيث يساعد هذا النموذج على تعزيز فهمهم للمفاهيم غير المألوفة من خلال معرفة وتمييز ما هو وما ليس كذلك. تستكشف هذه الدراسة تأثير نموذج فراير الرقمي كأداة تربوية في معالجة فهم القراءة لدى طلاب اللغة الإنجليزية لغة أجنبية للمفاهيم غير المألوفة. تشمل العينة (٦٤) طالبة من طلاب المرحلة الثانية من قسم اللغة الإنجليزية بكلية التربية للبنات بجامعة تكريت. استمرت الدراسة لمدة شهرين في العام الدراسي ٢٠٢٣-٢٠٢٤. تتكون الدراسة من مجموعتين؛ مجموعة تجريبية ومجموعة ضابطة بواقع (٣٢) طالبة لكل مجموعة. في البداية تم إجراء اختبار أولي لمعرفة نظرة عامة على مستوى الطلاب في اللغة الإنجليزية. خلال المعالجة، استخدم الطلاب في المجموعة التجريبية التي تعرضت لاستخدام نموذج فراير الرقمي وفي المجموعة الضابطة التي استخدمت الطريقة التقليدية. وبناءً على البيانات التي تم جمعها من خلال الاختبار اللاحق في القراءة، تم اكتشاف أن النتائج التي حققتها المجموعة التجريبية التي تعرضت لنموذج فراير الرقمي أكبر من تلك النتائج التي حققتها المجموعة الضابطة التي تعرضت للطريقة التقليدية. وهذا يشير إلى تفوق المجموعة التجريبية على المجموعة الضابطة وهو ما يظهر في نتائج اختبار القراءة الذي تم إجراؤه لهم.

1. Introduction Vocabulary is a crucial component in reading instruction besides it is necessary to teach students how to read successfully (Sedita, 2005). Learning vocabulary is important for mastering foreign language. Additionally, comprehending and memorizing unfamiliar vocabulary of another language is not easy and considered challenging. Therefore, adopting supportive strategies is necessary. According to Alashry et. al., (2019), gaining new vocabulary is essential to develop the four language skills. Students possessing an extensive vocabulary or having rich concepts will be able to convey their emotions and thoughts in a foreign language. In contrast to those with a limited vocabulary may encounter obstacles in other area. One of the important vocabulary instruction strategies, is that follows a multi-component approach to assist students learn and comprehend vocabulary. Graves (2000) asserts on using a four-part system that involve intensive reading, teaching words separately, enhancing strategies of word learning, and promoting vocabulary consciousness. The Frayer model, invented by “Dorothy Frayer and two of her colleagues in 1969”, is a graphic organizer utilized visually for concepts development and build vocabulary (Reilly 2017). It is a versatile graphic organizer that can be used to meet the needs of English language learners. Also it is helpful for teaching words especially that characterizes concepts or vocabularies students may already know but they unable clearly define (Panjaitan, 2020). This model employs visual framework for vocabulary development. It demands learners to (1) outline the target words or concepts, and (2) use them through creating examples and non-examples. This information is presented on a graphic subdivided into four categories which visually guide learners by encouraging them to present relevant features and definition instead of irrelevant features. This adaptation might improve the Frayer model's access among students might need a solid mastery of the language as well as those who find it difficult to separate among important and unimportant characteristics. (Wardarita & Surastina 2024) The Frayer Model, as a pedagogical tool, demands students to identify target concepts or words, and use them by generating another examples and non-examples, writing characteristics, or drawing an image to show the full meaning of the word in order to be more understanding to the students. Students should write down information on a graphic organizer that is divided into four parts to offer a visual representation of the information. This educational strategy helps students to define and comprehend unfamiliar vocabulary. The Frayer Model relies on a student's previous knowledge to build links between new words and creates a visual reference which assists students learn to make a comparison among attributes when they acquire new vocabulary.

1.1. The Problem of the Study

Through teaching reading comprehension, the researcher found that there is a problem among second-year students, which is that the students face difficulty in understanding unfamiliar vocabulary. Moreover, the students were unable to understand the meaning of several vocabularies in the text, and the students struggled to grasp the text successfully, as well as they felt bored through the process of reading and many of them had little motivation towards reading. Therefore, teachers have an essential role in guiding and facilitating the students through the process of reading, and thus they have to decide on appropriate strategies to achieve that.

1.2. The aim of the Study

This research aims at:

1- Finding out the effect of Digital Frayer Model on EFL University students' unfamiliar vocabularies in reading comprehension.

1.3. The Hypothesis of the Study

The hypotheses of the current study are:

1- No significant variations found comparing the mean results of the (E) group given instruction via Digital Frayer Model and mean results of the (C) group instructed with the standard method for vocabulary instruction.

1.4 The limits of the Study

The research is restricted to:

1- EFL students second stage from department of English, College of Education for Women, at Tikrit University for the academic year 2023-2024.

2- Teaching the textbook titled (select readings), the students are taught chapter 1, 2, and 3 from the book in the first semester of the study.

1.5 The value of the study

Fryer model presents many benefits to comprehend unfamiliar vocabulary. It helps students clarify the meaning of vocabulary encountered while reading a text. Besides, it enhances vocabulary retention as well as it promotes critical thinking and encourages active participation in learning. It can be used before reading to activate

background knowledge, or through reading to observe students' vocabulary, or after reading to evaluate their vocabulary. This model supports students' comprehension of new vocabulary helping them to search for meaning in different resources through examining the definition of the new vocabulary, its characteristics examples, and non-examples.

1.6. Procedures

The procedures employed by the investigator to check the hypotheses and accomplish the objectives of the research:

- 1- Explaining a "theoretical background" about the Digital Frayer Model.
- 2- Identifying a sample and divided them into control and experimental groups.
- 3- The two groups are equaled in their performance in last year examination.
- 4- Exposing the experimental group to Digital Frayer Model and the control group to the conventional method.
- 5- Preparing the post-test.
- 6- Performing the tools to the two groups.
- 7- Collecting the required data, then analyzing them based on suitable statistical means.
- 8- Explaining the findings and clarifying conclusions.

1.7. Definitions of Basic Terms:

Digital Frayer Model: is an adaptation of the traditional Frayer Model, it is a graphic organizer used as a learning tool to teach vocabulary. This digital version of Frayer model uses the technology to improve student's ability to access and engage through offering students to define words by utilizing interactive components, videos and images. It provides deeper understanding through its four sections for definitions, examples, non-examples, and contextual usage of words (Dazzeo & Rao, 2020).

The operational Definition: Digital Frayer Model utilizes digital tools to improve vocabulary understanding. Through leveraging technology, teachers create engaging and interactive learning environment that meets the diverse needs to student.

Unfamiliar vocabulary: Merriam-Webster dictionary defines unfamiliar vocabulary as "words or terms that are unknown or not easily understood by a person due to their lack of exposure or experience with those specific words."

The operational Definition: Unfamiliar vocabulary refers to words or vocabularies that a student does not understand, or recognize, it is not accustomed to due to a lack of prior exposure or knowledge.

2. Literature Review

Possessing an extensive vocabulary is essential for comprehension of texts since it helps us to understand what we read. The knowledge of words meaning, which is acquired via a collection of vocabulary occurs as a results of the accumulation of vocabulary that a person has acquired and expanded them during their lives. This may lead to comprehend how to employ and interpret these words in different situations is crucial for successful communication, overall academic achievement and reading comprehension (Aryanti, 2017).

Suberviola and Méndez (2002) addressed the need, techniques and activities of vocabulary learning, underlining the significance of semantic maps for boosting students' words remembering capabilities. One of this methods for tackling and enhancing vocabulary is Frayer model which is effective for defining unfamiliar words, since it fosters a greater understanding of new vocabulary It demands students engage in the vocabularies by defining it, giving examples and non-examples, and linking them to previous knowledge. This process supports students to discover significant connections between the new words and their previous knowledge. Hence, improving their recall and retention of the vocabulary. In addition, the Frayer Model promotes students in examining the structure of the word, consequently increasing their comprehension of related vocabulary and word families. These features render the Frayer Model a useful method for retention and language learning. (Wardarita& Surastina 2024)

Beck et al. (2013) propose several suggestions for the design of effective vocabulary learning. Initially, teachers ought to present student-focus clarifications and explanations of the vocabulary rather than relying on dictionary definitions. These clarifications have to highlight the literal meaning of the word in common language, and define its characteristics normal use. When classifying each term, educators could offer synonyms to improve one's understanding of a word's meaning while helping storage. To tackle unfamiliar vocabulary in reading comprehension, Hunt et al., (2013) assert that the Frayer Model can be used as a visual instructional organizer employed by students in EFL courses to figure out the meaning of various vocabulary and terms. This model works to encourage students' prior knowledge before starting any activity or task, observe their use of

vocabulary throughout the task, and evaluate their vocabulary acquisition after the task completion. The model offers learners with words in several important contexts, enabling them to complete the model by explaining definitions, attributes, examples, and non-examples of vocabulary. In the process of learning new words, students are required to take an active role with the subject matter by drawing connections to their previous knowledge and experiences in order to acquire new vocabulary (Rupley et al., 2012). Instructors can depend on technology to design and implement instruction, beside involve engaging and flexible choices through setting their educational goals and assessments (Cook et. al., 2018). To keep students' engagement, teachers ought to think about the integration of digital tools to improve certain instructional goals during class designing. Numerous researches indicate that the incorporation of multimedia as well as technology in the classroom may boost student's engagement and learning outcomes. Additionally, educators have to involve students in vocabulary play activities that foster deeper comprehension of what is meant of each word. Word-play activities assist students to associate new vocabulary using familiar terms by using various interactive tasks (Beach et al., 2015; Beck et al., 2013). To enhance the involvement of student in the active acquisition of new vocabulary and concepts, educators can employ digital resources beside technology-driven practices and strategies that facilitate interactive learning, explicit instruction, and interest among students. In lesson design, instructors may contemplate the integration of digital tools to support certain teaching objectives. Researchers have discovered methods that use digital tools to enhance the development of vocabulary, and meet various needs and interests of students, and encourage self-sufficient word acquisition (Carnahan et al., 2012; Dalton & Grisham, 2011; Rupley et al. 2012). PowerPoint and its online counterpart, Google Slides serves as an easily accessible digital tool that is often neglected in technology-based strategies is PowerPoint and its online counterpart, Google Slides. Google Slides can be utilized innovatively for communication, allowing students to work and interact with unfamiliar vocabulary and create slides that across many procedures: text, animation, video, and graphic (Dalton & Grisham, 2011). In order to demonstrate the definition of a word, educators and learners can create a Google Slide as a digital vocabulary assess, effectively acts as a digital visual organizer for each vocabulary term.

2.3 Related Previous Studies

DeGennaro & Frasier (2023) highlight on developing the learners and how this study can contribute toward a scientifically-literate citizenry. The design of the study is qualitative analyzes. The study interest in how teaching an undergraduate astronomy and learning students on an astronomy concept. The sample involves (19) FMs were analyzed from a population where small ethnic diversity. A case study approach of thematic analysis was utilized by implementing a pre-post lessons using Frayer Model to students in an ASTR 1010 section and the lectures were recorded. An analysis was conducted on whole Frayer Models as well as transcription of all lectures. The main findings reveal that there is positive improvement where students employed a keyword, such as "perfect absorber," to describe blackbodies. In addition to that there is development in their visual comprehension when they drew and labeled blackbody spectra correctly. Al-Tonsi (2022) examined "the effectiveness of the Frayer Model Plus in developing secondary stage students' translation skills". The sample of the study was (50) first class secondary stage students, where selected randomly to be in two groups. Both groups were exposed to post test in the Translation subject matters. The experimental group received specific program in translation based on the Frayer Model, while the control group received instructions in translation texts traditionally. The results of the data analysis revealed that the experimental group exceeded the control group on the post Translation Test. Additionally, the study demonstrates the positive effect of the suggested program based on the Frayer Model in developing the participants' translation skills. Alashry et. al. (2019), his study aimed at enhancing vocabulary learning throughout using Frayer Model and Contextual Redefinition strategy. The study depends on a quasi-experimental design and utilizing three groups one of group is control while the others are experimental. Only one tool was employed in the current study which was a vocabulary test. The sample involved (75) learners from second year preparatory school of Mahmoud Shehab Preparatory school, in Dakahlia Governorate, where 25 learners are distributed for each group. The first experimental group received instruction according to the Frayer Model and the second experimental group received instruction according to contextual redefinition strategy. The study lasted for six weeks. The main results revealed that there is an important difference between the mean values of the two experimental groups and the control group in the post-test. In addition, there is an important difference between the mean values of the pre-test and post-test of the 1st experimental group and the 2nd experimental group in favor of the post-test. These results illustrated that Contextual Redefinition strategy had a great impact on the learners' learning new vocabulary.

Mardiyah (2014), studied Frayer Model which greatly enhanced the students' achievement in vocabulary mastering. This study carried out through classroom action methodology. The research sample comprised (32) students from the seventh grade of SMP Nigeria. The study was executed in two stages including six meetings. The tools used for gathering the main data were derived from the students' vocabulary mastery scores, whereas, the tools used to gather other data included interview sheet, questionnaire sheet, and observation sheet.

2.4 Discussion of Previous Studies

These studies collectively underscore the Frayer Model's efficacy in improving vocabulary development, conceptual comprehension, and translation abilities many educational settings. Previous studies relied on different methods to collect data, including thematic analysis, some of which used tests, interviews, and observations to monitor students' progress. The current study relies on posttest in collecting data. Most of the samples of previous studies were high school students, except for DeGennaro & Frasier study, which was conducted on university students in astronomy. The sample of the current study is second-year students in the English Department at Tikrit University. DeGennaro & Frasier study aimed to improve the understanding of the concept of astronomy, Al-Tonsi study aimed to develop translation skills for high school students, while the third and fourth study aimed to develop students' vocabulary in general. While the aim of the current study is to address unfamiliar vocabulary among students in reading comprehension.

3. Methodology

3.1 Design of the study

The design of the current study is a quantitative in which posttest design is performed as an assessing instrument. The current study involves two variables one independent variable which is digital Frayer Model and a dependent variable which is tackling unfamiliar vocabulary. The study adopted the quasi-experimental design utilizing two groups. One of them was the control who was taught through memorizing unfamiliar vocabulary in English language book traditionally. The second one was the experimental group who was taught unfamiliar vocabulary through digital Frayer Model.

3.2 Participants

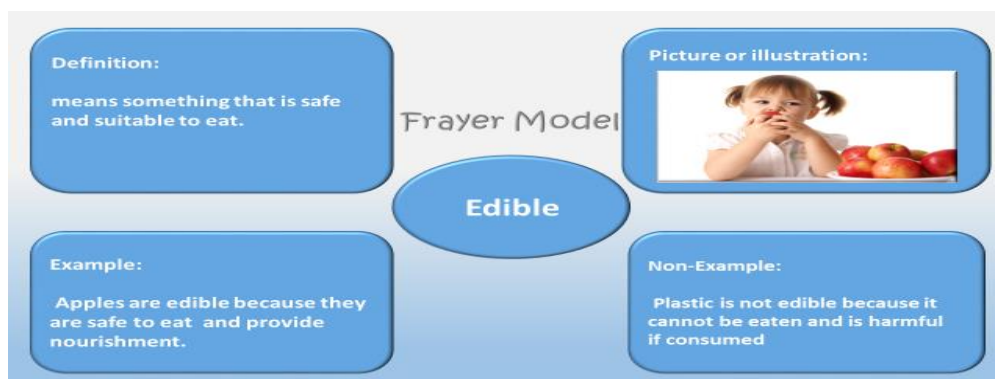
Eligible students were defined where their number was (64) EFL students 2nd stage from department of English, College of Education for Women, at Tikrit University in 2023-2024 Academic Year. Students are distributed into two groups; each group comprises 32 students.

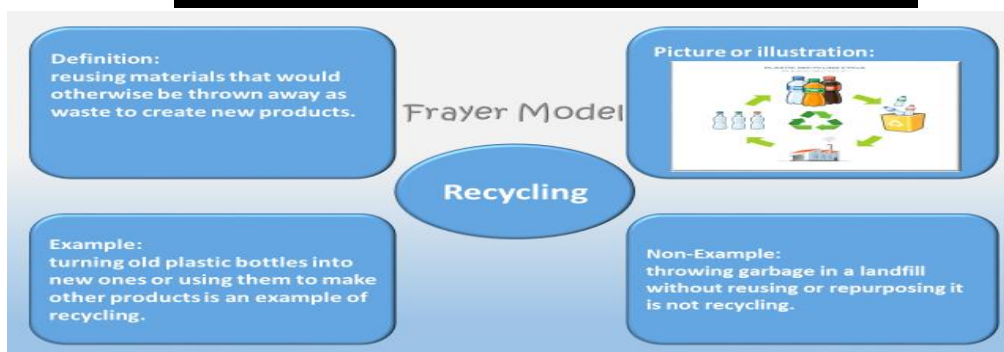
3.3 Instrument of the Study

In order to perform the aim of the present study, the posttest instrument was used to evaluate students' achievement in learning unfamiliar vocabulary before and after the treating.

3.4 The Implementation of the Digital Frayer Model

By leveraging technology, educators can create interactive and stimulating learning experiences that cater to diverse student needs. Initially, target vocabularies are determined from reading passages. After that students are asked to utilize these words based on the digital Frayer Model Chart. In this case, students search for the meaning of each unfamiliar word with the help of the internet. Students need to fill the four parts of Frayer model with correct information in terms of writing the characteristics of the selected word, write examples of the word, write non-examples of the word, and write a definition for the selected word. The next step, the teacher advising students to fill the graphic organizer through using the Microsoft PowerPoint (PPT) in order to clarify the information. A digital graphic organizer enables students comprehend the meaning of unfamiliar vocabulary effectively. This dynamic approach can enrich learning as it aligns with the development of technology at the present time. The following are some examples which have been produced by students through applying digital Frayer model.





The procedures below should be taken into consideration when using the Digital Frayer Model

The first step is preparation

- 1- **Select a Digital Tool:** Choose a n appropriate digital platform such as Google Slides.
- 2- **Prepare a Template:** Design a digital graphic organizer with four sections based on PPT.
- 3- **Choose a Text:** Select a suitable reading passage texts that include unfamiliar vocabulary align to students' proficiency levels.

The second step is introducing the Digital Frayer Model

- 1-**Clarify the Purpose:** Explain that the Frayer Model to assist understanding vocabulary deeply through exploring different aspects of vocabulary.
- 2-**Demonstrate a Sample of Unfamiliar Word:** Utilize unfamiliar word to model how to complete each section of the digital template.
- 3-**Engage Students:** Let students predict the meaning of the sample word before revealing answers.

The third step is guided practice with target vocabulary

- 1-**Assign Words:** Give students with a number of unfamiliar words from the reading passage.
- 2-**Collaborative Work:** Let students work in pairs or small groups to fill the four sections of the digital Frayer Model for each word.
- 3-**Encourage Research:** encourage students to use online dictionaries, Internet, and AI-based tools to gather information.

The fourth step is application in reading comprehension

- 1-**Contextual Understanding:** Help students to determine the target words in the reading passage then clarify their usage in context.
- 2- **Discussion:** Assist a discussion with class in which students present their results and then compare among their interpretations.
- 3-**Interactive Activities:** Use games or digital flashcards to enhance understanding of the vocabulary.

The fifth step is independent practice and assessment

- 1-**Individual Application:** identify students to create digital Frayer Models for new vocabulary that they face independently.
- 2-**Peer Review:** Encourage students to provide feedback on each other's digital Frayer Models.
- 3-**Assessment:** assess students' work based on accuracy, creativity, and depth of understanding.

The sixth step is reflection and expansion

- 1-**Self-Reflection:** Ask students write a brief reflection on how the Digital Frayer Model can assist them in understanding unfamiliar vocabulary.
- 2-**Extension Activities:** Encourage students to follow the model across different subjects or in creative writing tasks.
- 3-**Teacher Feedback:** write positive and constructive feedback then suggest improvements for future vocabulary-learning.

These completed Frayer Models considered as a good tool for reviewing vocabulary and words before a test. Additionally, this digital graphic organizer supports students in making connections between vocabulary and ideas to boost their comprehension. The steps that the researcher take into consideration in teaching digital Frayer model in the classroom to tackling EFL students' unfamiliar vocabulary in reading comprehension were as follows and as shown in table (2) below:

Table (1):

Specification of the Description of Frayer Model, Description, Behavioral Objectives, Criteria and the Criteria of the Post Test

Components of Frayer Model	Description	Examples	Behavioral objectives	Criteria
Definition	A clear explanation of the word's meaning.	Process by which plants convert sunlight into energy.	Define the unfamiliar word in their own words.	Accuracy of the definition given.
Characteristics	Key features or properties of the word.	Requires sunlight, carbon dioxide, and water.	Identify distinguishing traits of the unfamiliar word.	Correct identification of key characteristics.
Examples	Words, phrases, or situations that illustrate the meaning.	Trees, grass, flowers undergo photosynthesis.	Provide correct examples related to the word's meaning.	Relevance and accuracy of given examples.
Non-Examples	Words or situations that do not represent the meaning.	Humans do not perform photosynthesis.	Differentiate between correct and incorrect usage.	Appropriateness of chosen non-examples.

The posttest has been presented to a committee of specialists in ELT, to emphasize the validity of the measure tool used in the study, they accepted 98% of the test. Reliability of the items of the test determined based on the "reliability coefficient test" and by using the statistical "package for the Social Science Program" (SPSS). The suitable value of "Crombach Alpha" is (0.787) which refers to suitable and acceptable consistency of reliability. After teaching the students digital Frayer model, the reliable of the test is managed to the target groups of students, after being valid.

4. Data Analysis

The measuring instrument that used to obtain the data is a post-test. The test has been constructed depend on the criteria to measure unfamiliar vocabulary to measure the differences between control and experimental group. At the end of the treatment, both groups underwent to the same achievement test that consists of multiple-choice items on the target words as well as meaning determination question. The goal of this test was to assess the students' knowledge and to what extent they benefited from Frayer model. The data gathering process takes these steps: after the posttest was administered to both groups, the students' achievements were scored in which two sets of data scores were created. The students in the test received vocabulary instruction based on Frayer template. The teacher writes the target word at the center of the Frayer template. The students brainstorm a list of questions and ideas about the presented word. Then, the participants asked to generate the definition, main characteristics, examples, non-examples, explained the attributes of the target words. Finally, two lists of students' scores were yielded. The gathered data is analyzed by the SPSS Program, after the data gathered from students' responses to the posttest questions, with the aim of answer the hypothesis of the study.

4.1 Analysis of Results & Discussion

The objective of the study is finding out the effect of Digital Frayer Model on EFL University students' unfamiliar vocabularies in reading comprehension. This objective is verified based on t-test for two independent groups. The result of the statistical analysis has revealed that the mean scores (M.S) of the CG is (61. 00) with a standard deviation of (10. 74) with the (M.S) of the EG is (65. 39) with a standard deviation of (9.58). The computed t-value is (3.11) which reveals greater than the tabulated t-test value which is (2.00) at a level of significance of (0.05) and a degree of freedom (D.F) of (62). The result refers that there are "statistically significant differences" between the EG and the CG in favour of the experimental group which means that the students have fulfilled great findings in learning unfamiliar vocabularies. As shown in table (2):

Table (2):The Experimental and Control Groups performance in the Post Test

Croups	NO.	Mean	Stand	T-value		D.F	L.S
				Computed t-value	Tabulated t-value		
Experimental	32	65. 39	9.58	3.11	2.00	62	0.05
Control	32	61. 00	10. 74				

5. Conclusions and Recommendations

By embracing the Digital Frayer Model, educators can create a more inclusive and engaging learning environment that supports vocabulary development and comprehension of complex concepts through interactive and collaborative means. The findings of Digital Frayer Model proved an engaging and effective

instructional environment that improve students' conceptual comprehension, retention of knowledge, and critical thinking. Through incorporating digital instruments, this model serves as modernize conventional teaching methods, making the environment of learning more accessible and interactive. It supports students to acquire unfamiliar vocabulary easier and visualize concepts as well as reinforcement their comprehension through multiple representations. Furthermore, the Digital Frayer Model considers as a valuable pedagogical tool that aligns with 21st-century learning needs. Teachers must consider performing this strategy to enhance student learning outcomes, support personalized instruction beside foster active participation. In conclusion, the integration of technology in the Frayer Model enhances student participants, particularly in digital learning environments, through leveraging technology resources and its features.

The researcher advises on some important issues when teaching digital Frayer model. When identifying unfamiliar words from reading textbook try to explain the importance of the 4 sections of the Frayer Model to the students and how they can work on PPT or Google slides so they can understand what is the necessary expectations for recording information. In this phase, the students may ask teachers several questions for more clarification in some parts. The teacher must focus on particular points which are: Are students understand adequately each part in graphic organizer? Now, let the students read the task text and carefully define the target concepts using the 4 sections chart for each concept. After that, let the students share their own completed Frayer Models with their classmates to compare their understanding and gain new ideas from one another

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