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**“The Impact of E-Mind Mapping Technique  
on Preparatory Schools Pupils’ Learning English  
Language Grammar”**

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## Abstract

### **The Impact of E-Mind Mapping Technique on Preparatory Schools Pupils' Learning English Language Grammar**

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The present research aimed at investigating the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar. The research followed the quasi experimental design of two groups (control and experimental). A total of fifty third year preparatory school pupils of Hamed Gouher official language school, Red Sea governorate, Egypt, were randomly assigned to two groups; twenty five pupils for the control group and twenty five for the experimental. The researcher designed and used the instruments of the research, which included: a questionnaire of learning English language grammar problems, an English Language grammar achievement test, and an instructional unit based on e-mind mapping technique. The results of the research showed the statistically significant differences between the mean scores which obtained by the experimental group in the pre/posttest of the English Language grammar achievement (in favor of the posttest). Moreover, there were statistically significant differences between the mean scores of the experimental and the control groups in the post test of English Language grammar achievement (in favor of the experimental group). Therefore, the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar has been verified.

#### **Keywords:**

*E-Mind Mapping, English Language Grammar*

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## المستخلص

أثر تقنية رسم الخرائط الذهنية الإلكترونية على تعلم قواعد اللغة الإنجليزية  
لدى تلاميذ المدارس الإعدادية

إعداد

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هدف البحث الحالي إلى التحقق من أثر تقنية رسم الخرائط الذهنية الإلكترونية على تعلم قواعد اللغة الإنجليزية لدى تلاميذ المدارس الإعدادية. اتبعت الدراسة التصميم شبه التجريبي ذو المجموعتين (الضابطة والتجريبية)، تم اختيار خمسون من تلاميذ الصف الثالث الإعدادي بمدرسة حامد جوهر الرسمية للغات بالگردقة، محافظة البحر الأحمر، مصر، بشكل عشوائي وتقسيمهم إلى مجموعتين: خمسة وعشرين للمجموعة الضابطة، و خمسة وعشرين للمجموعة التجريبية. وقامت الباحثة بتصميم واستخدام أدوات البحث والتي تضمنت: استبيان عن مشكلات تعلم قواعد اللغة الانجليزية، و اختبار تحصيل قواعد اللغة الإنجليزية ، وحدة تعليمية قائمة على تقنية رسم الخرائط الذهنية الإلكترونية. وقد أشارت نتائج البحث الى وجود فروق ذات دلالة إحصائية بين متوسطات الدرجات التي حصلت عليها المجموعة التجريبية في التطبيق القبلي والبعدي لاختبار تحصيل قواعد اللغة الإنجليزية لصالح التطبيق البعدي، كما أسفرت ايضاً عن وجود فروق ذات دلالة إحصائية بين متوسطات درجات المجموعة التجريبية والضابطة في التطبيق البعدي لاختبار تحصيل قواعد اللغة الإنجليزية لصالح المجموعة التجريبية. بناءً على ذلك، تم التحقق من أثر تقنية رسم الخرائط الذهنية الإلكترونية على تعلم قواعد اللغة الإنجليزية لدى تلاميذ المدارس الإعدادية.

الكلمات المفتاحية: رسم الخرائط الذهنية الإلكترونية ، قواعد اللغة الإنجليزية

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## **1. Introduction**

English has become the most common foreign language in the world. It is considered the most wide spread language all over the world which used to express ideas, thoughts, and to communicate with people. English grammar, as one of the English components, is very important in learning language. When pupils master English grammar well, they will be able to construct correct sentences and to communicate effectively. Thus, with a good knowledge of grammar, pupils will be able to construct grammatically acceptable English sentences creatively.

English grammar is an essential part of English learning, and it is the basis for pupils to grasp English. Hamad (2011) highlighted the importance of grammar as an essential source for students to make sense for language and to produce more accurate sentences free from errors. Normawati (2020) indicated that however some pupils have difficulty in learning a language that is not their mother tongue; there is a challenge for grammar teachers to find an interesting technique that can help them to learn grammar more effectively. He assured that effective learning occurs when pupils are actively involved in understanding learning material, and this can be facilitated by mind mapping.

Mind mapping is a visual information management tool that helps learners structure, organize, arrange, brainstorm, and learn information in a completely specialized way (Al-Jarf, 2009). It is a technique for storing, prioritizing, learning, reviewing, and memorizing information. It presents an overview and summary of a body of language that fuses words and pictures together (Alomari, 2019). Suseno & Setyawan (2014) stated that it is a diagram used to visually portray the relationship between ideas, words, or other items around a central idea or keyword. It has structure that radiates from the center, using curved lines, symbols, words, color, and images.

Chang (2018) mentioned that mind mapping technique has advantages as an active and collaborative learning tool in a wide variety of educational environments. Moreover, Hongxia (2010) proposed that mind map was helpful for students to exchange and cooperate with others, and it could boost their abilities of independent learning and improve their interest in learning English words.

Moreover, Wang (2019) assured that applying mind map in English grammar learning can improve the learners' interest and efficiency, thus mind map is decorated with colors, pictures, code, multi-dimension, and can lessen the

challenges of traditional grammar learning and arouse the enthusiasm of students. On the other hand, mind map can help the learners to understand and remember, be more convenient to extract the information of grammar, and improve the efficiency of grammar learning. Moreover, Xiujing (2016) stated that teachers introduced mind map into English grammar teaching could not only to raise students' interest but also to improve their competence of grammar knowledge. Fangping (2013) claimed that using mind map had good effect on vocabulary, grammar, reading and writing teaching. Elkahlout (2014) assured that mind mapping is an effective technique to enhance the correct use of grammar rule among the target students because of the importance of grammar in improving linguistic competence and the level of communication.

Although mind maps are usually drawn on paper, there is an increasing interest in using the computerized versions among other digital educational technologies. Thus, there are two types of mind maps: (a) traditional mind maps drawn manually by using paper and pen or on the board, and (b) electronic mind maps that apply the same steps through using computer software that automatically generate flow branches of ideas derived from the central one. Moreover, ideas can be edited or moved while images and symbols can be added (Abdulbaset, 2016).

Abbaspoura (2019) indicated that e-mind maps are more effective and attractive than traditional ones, since they depend on using fast and specialized computer software which includes photos, colors, and drawings that attract the learner. Hence, some authors suggested using e-mind maps in an early education stage as they help students organize ideas and information. According to Jbeili (2013) electronic mind map is one of the active learning techniques and it is effective tool that enhance memory, and generate new creative ideas as it works at the same steps of human mind which activate both human spheres and arrange information in a way helps the mind to read and remember information instead of linear thinking. He declared that electronic mind map looks like creative sketches consists of branches radiating from the center lines using words and symbols, colors, and are used to represent relationships between ideas. Additionally, their preparation does not require high skills since software contain drawings, clip arts, symbols, and images that can be easily inserted (Elabady & Jradat, 2015).

## **2. Context of the problem**

- As a lecturer in the curriculum and instruction department (TEFL) at Hurghada Faculty of Education, the researcher observed that some pupils' level of the third

year preparatory schools in the English Language grammar was below the average. They seemed to encounter difficulty in learning English language grammar; they did not understand the grammar rules, and how to use it in the sentences. In addition, they are not interested to learn grammar because their teachers used bored techniques. Thus, they need to learn English grammar through an interactive technique to cater their individual styles of learning.

- The researcher conducted a pilot study by applying a questionnaire of learning English language grammar problems on (30) pupils from Hamed Gouher official language school during the first semester of the academic year 2022- 2023.

*Analyzing the results, the following points can be concluded:*

1. Most pupils had problems in learning English language grammar.
2. Most pupils were not satisfied with the teaching techniques their teachers use.
3. They need to learn English grammar through an interactive technique instead of the conventional method.

Learning English Language Grammar Problems	Percentage	
	Yes	No
1. Do you like grammar?	% 33	% 67
2. Is learning grammar difficult?	% 83	% 17
3. Do your teachers use interactive techniques in teaching grammar?	% 17	% 83
4. Can the use of e-mind mapping technique increase your motivation in learning grammar?	% 90	% 10
5. Is e-mind mapping a creative means in learning grammar?	% 80	% 20
6. Can the use of e-mind mapping technique solve your problems in learning grammar?	% 80	% 20
7. Does e-mind mapping help you to study grammar easier?	% 90	% 10

Various studies declared the impact of e-mind mapping technique on learning English language grammar, such as: Elawfy (2011), Harbi (2013), Gomaan (2015), Aljaser (2016), and Normawati (2020). Based on the previous, the present research used e-mind mapping technique on preparatory schools pupils' learning English language grammar.

### **3. Aim of the research**

The present research aimed to:

- Investigate the impact of e-mind mapping technique on preparatory schools pupils' learning English language grammar.

#### **4. Questions of the research**

The present research attempted to answer the following questions:

- What are e-mind maps that are used to learn English language grammar of the third year preparatory schools pupils?
- What is the impact of e-mind mapping technique on preparatory schools pupils' learning English language grammar?

#### **5. Hypotheses of the research**

The present research tested the following hypotheses:

- There are statistically significant differences between the mean scores of the experimental and the control groups in the post-test of the English language grammar achievement favoring the experimental group.
- There are statistically significant differences between the mean scores of the experimental group in the pre/posttest of the English language grammar achievement favoring the post administration.

#### **6. Significance of the research**

The research was supposed to be significant for the following:

1. Preparatory schools pupils: as e-mind mapping technique is supposed to help them to understand, recall, and learn how to apply the grammar rules correctly.
2. Teachers: as it directs their attention to the importance of e-mind mapping technique in improving their method in teaching grammar.
3. Course designers: as it may pay pave the way to investigate the impact of e-mind mapping in improving other language skills.

#### **7. Delimitations of the research**

The research was delimited to:

1. A sample of (50) pupils of the third year preparatory schools, Hamed Gouher official language school, as this stage prepare them for the secondary schools.
2. The first semester of (2022/2023).

#### **8. Instruments of the research**

The researcher designed and used the following:

1. A questionnaire of learning English language grammar problems.
2. An English language grammar achievement test.
3. An instructional unit based on e-mind mapping technique.

## 9. Definition of terms

### • E-mind mapping

- Ruffini (2008) defined it as computer-generated mind map that can represent complex information in an organized, easy-to-understand visual format.
- Zaki, Gheith, Nassar & Al Saify (2014) defined it as a digital non-linear web activity that constructs a unique cognitive structure.
- It is defined operationally as the ability of the third year preparatory schools pupils to use computer software which includes lines, symbols, words, color, and images to learn English grammar easily.

### • Grammar

- Swan (2005) defined it as a set of rules that describe how words, phrases, clauses and sentences produce meaning.
- Eunson (2020: 1.6) defined it as a system of rules (and exceptions to those rules) that reveals and structures meaning in language, and is made up of two things: syntax and morphology. Syntax is concerned with the pattern or sequence of words in sentences, while morphology is concerned with the shape or nature of words.
- It is defined operationally as the ability of the third year preparatory schools pupils to construct correct sentences to communicate effectively.

## 10. Review of literature

### • 10.1. English language grammar

English grammar, as one of the English components, it is very important in learning a language. When the learners master the English structure well, they will be able to construct correct sentences and to communicate effectively. Moreover, without adequate grammar knowledge, learners' language development will be severely constrained (Wibowo, 2020). Harley (2001) stated that grammar is a formal instrument which uses a finite number of rules enabling the learners to construct sentences. Greenbaum & Nelson (2002:5) stated that grammar is the center component of language, and it contains the set of rules which enables to combine words into larger units. It means that with a good knowledge of grammar, the students will be able to construct grammatically acceptable English sentences creatively.

Grammar plays a central role in the four language skills and vocabulary to establish communicative tasks (Widodo, 2006). Thus, a good knowledge of English grammar can allow the students to comprehend English written or spoken texts with ease. Andrews (2006) indicated that grammar includes the study of syntax (word order), clause and phrase structure, and the classification of parts of speech (noun, verb, predicate, clause, etc.). Obaid (2010) believed that grammar is a set of directions and orders that control the use of a language and organize the words to transfer an expressive language. In addition, Singh (2011) indicated that Grammar is one of the most major elements that a language has, which refers in a word to the correctness and accuracy in a language. Abu Taleb (2015) also mentioned that grammar is the systematic and arranged structure of language. It is the rules in which it can make a meaningful words, sentences and paragraphs.

Even though grammar is a fundamental material that must be mastered by the students, there are many students who do not like learning grammar. Grammar often triggers a negative reaction in both teachers and students. Moreover, the term grammar often brings the students' mind into unpleasant memories. Meanwhile, many students face difficulties to understand and apply the English grammar, especially in learning tenses (Suseno & Setyawan, 2014).

Widodo (2006) assured that, in the EFL context, practically in grammar teaching the students are taught rules of language using grammar translation method, in which the learners are provided with the grammar rules and the examples and are told to memorize them, and then are asked to apply the rules to the other examples. Thus a better technique is to use a multi-dimensional outline which allows putting down the ideas in the form of diagrams. This form is called mind mapping.

### **Importance of Grammar**

In teaching grammar, learners are taught rules of language commonly known as sentence patterns. The knowledge of grammatical rules enables learners to know and apply how such sentence patterns should be put together. Further, grammar is thought to furnish the basis for a set of language skills: listening, speaking, reading and writing. In listening and speaking, grammar plays a crucial part in grasping and expressing spoken language, since learning the grammar of a language is considered necessary to acquire the capability of producing grammatically acceptable utterances in the language. In reading, grammar enables learners to comprehend sentence interrelationship in a paragraph, a passage and a text. In the context of writing, grammar allows the learners to put their ideas into intelligible sentences so that they can successfully communicate in a written form. Lastly, in the case of vocabulary,

grammar provides a pathway to learners about how some lexical items should be combined into a good sentence so that meaningful and communicative statements or expressions can be formed (Sherly & Nethra, 2017).

### **Approaches of Teaching Grammar**

Shirav & Nagai (2022) indicated two main approaches of teaching grammar; the deductive and the inductive approach:

When teaching deductively, the teacher presents the grammatical structure explicitly at the onset of the lesson. The instruction usually involves a detailed explanation of the rules, forms, and contexts where the newly presented grammar can be used. The deductive approach is considered to be a traditional, teacher-centered, focus-on-form instruction. This method has been widely used and most students are familiar with this type of teaching. Widodo (2006) provided a considerable list of the advantages and disadvantages of the deductive approach. He noticed that it is time-saving, easier to process, includes examples, beneficial for adult learners with developed cognitive skills, and learners know what to expect in the classroom. On the other hand, the deductive approach can affect younger learners negatively (e.g., difficult structures and terminology), teacher-centeredness of the method can decrease learners' involvement and interaction, and learners must rely significantly on their memory.

In the inductive approach, can also be called rule-discovery learning, the teacher attempts to highlight grammatical rules implicitly by providing examples. The learners are encouraged to use critical thinking, previous language knowledge, and language-learning strategies to analyze the given examples and formulate a rule on their own. It is a learner-centered approach, where the teacher plays the role of facilitator and guide. Widodo (2006) highlighted that the approach promotes learning autonomy, increases motivation, develops cognitive and problem-solving skills, and language-related episodes allow for language practice. However, the approach is time-consuming and demanding of the strategic lesson and curriculum planning, and there is a chance that learners may come up with the wrong concepts of the rule or be frustrated with the approach due to different learning styles and/or previous learning experiences.

- **10.2. E-Mind Mapping**

Mind mapping was developed by Tony Buzan, as a way to encourage students to record just by using key words and images, who stated that mind mapping is a powerful graphic technique, which provides a universal key to unlock the potential of brain. Mind mapping focuses mainly on the natural duties of the brain which records

and classifies things according to its natural duties. The brain of the human consists of two sides; the right which deals with rhythm, spatial cognition, general picture), imagination, daydreams, colors and dimensions; and the left side, which deals with words, logic, numbers, succession, planning, analysis and tables (1993:1).

Mind mapping is a simple technique for drawing information in diagrams, instead of writing it in sentences. The diagrams always take the same basic format of a tree, with a single starting point in the middle that branches out, and divides again. The tree is made up of words or short sentences connected by lines. The lines that connect the words are part of the meaning (Sukaeni, 2017). Sahraoui & saadi (2020) assured that, it is an effective technique which helped students to remember, organize, and develop their ideas. While for teachers, mind mapping is an enhancing, motivating, enjoyable, and applicable technique in the learning and teaching environment. Accordingly, by using mind mapping technique, students will be more active and get involved in the learning activities where teachers can recognize each student's interests and needs.

Mind mapping is an active and collaborative learning tool that allows an educator to move beyond the traditional 'chalk and talk' style of teaching. Its activities require students to actively engage in their learning by connecting their prior knowledge to new information. When creating a mind map, a student frequently interacts with a textbook, note from class, an instructor, classmate or study group (Chang, Chiu, & Huang, 2018).

### **The Importance of Mind Mapping**

Mind mapping can be used to generate ideas, take notes, develop concepts, and improve memory. It can be used in nearly every activity where thought, planning, recall or creativity is involved. Mind maps can unleash the minds potential because it mirrors the associative functioning of the brain which is radiant and holistic. Moreover, by adopting mind maps in the learning development, the whole brain will be involved in this process and it will be possible to perceive a vast improvement in the learning approach. The clue to the mind map's effectiveness lies in its dynamic shape and form. It is drawn in the shape and form of a brain cell and is designed to encourage the brain to work in a way that is fast, efficient, and in the style that it does naturally (El-Kenany, 2021).

Moreover, mind maps can serve in increasing students 'motivation in an enjoyable and easy way. It gives pupils opportunities for expressing themselves and their creativity. Mind mapping has been shown to bring a renewed sense of enthusiasm to the classroom because it increases the students 'achievement scores and knowledge

retention. It enables students to keep the whole knowledge 'picture' in view at all times, thus giving students a more balanced and comprehensive understanding of the subject (Mento, 1999).

### **The Components of Mind Mapping**

Booth & Swartz (2004:49) stated the following:

- 1) Images: mind map always has a central image that describes the main idea which helps the students to think with their imagination.
- 2) Lines: they are like the branches that collect much information and it connected to the central topic that radiates from the central image.
- 3) Words: one or two words are usually written on the connector line in order to identify key concept or ideas.
- 4) Colors: they can help organize the map and make it easier to read”. Moreover it makes easier to comprehend and remember what the students learn.

### **Characteristics of Mind Mapping**

Khoiriyah (2014) stated four basic characteristics for mind mapping:

- The object of attention is crystallized in the central figure.
- The main themes of the object branch out from the central figure.
- Branches contain a key image or key word on the associated line. Topics of lower significance are also represented as branches related to the higher significance branches.
- The branches form a connected nodal structure.

### **The Advantages of Mind Mapping**

Tondeur (2017:3) assured that mind mapping help with communicating, creative thinking, essay writing, idea generating, note taking, organizing, planning, problem solving, reading, remembering, and understanding. Buzan (2005:17) indicated the second advantages of mind mapping; “plan, communicate, be more creative, save time, solve problems, concentrate, remember be better, and study faster”. Salai (2014:6) declared that mind mapping helps to make a plan or it used for time management. It refers to helps the student to make daily schedule, lesson time, agenda and some plan and it makes efficient because everything has managed in mind map.

Deporter & Hernacki (2008:172) stated that there are some advantages of using mind mapping technique. They are as follows:

- Flexibility of use.

- Concentration on the topic; it helps focusing on the central idea while the sub-idea revolve around them without distraction.
- Increase of comprehension; using mind mapping can make understanding of the material easy.
- Enjoying of drawing; mind mapping has an affective aspect that it incites imagination and creativity.

### **The Usage of Mind Mapping In Education**

Sukaeni (2017) stated some of the most important uses of mind mapping in education:

- It helps to organize information.
- It can be used as a memory aid; each mind map has a unique appearance and a strong visual appeal. Thus, information may be memorized and recalled faster.
- It may summarize ideas.
- It helps to connect new information with given knowledge.
- It fosters creativity; as mind maps have different forms and shapes, colors, symbols or images.

### **Types of Mind Mapping**

Tondeur (2007) stated some types:

1. *Mini Mind Map*: This type is based on a central idea with many branches radiating from it without sub-branches. It tends to generate topics on one simple idea.

2. *Idea Generation Map*:

2.1. Idea generation map (stage 1): It is a type of brainstorming map where the writer writes all the possible ideas that comes into his mind about a topic randomly. This type is useful and very helpful when the writer faces a difficulty in starting the writing.

2.2. Idea generation map (stage2): This type is considered as a second or redrawn version for the first brainstorming map (stage1), where the writer turns to his first draft and selects all the key and main ideas and tries to link them with each other, and then rewrites them in another map. The objective of this type is to organize ideas.

3. *Planning*: In this type, the writer collects all the ideas from idea generation (stage 1&2) and uses them to form a final map that will be transferred into a paragraph, an essay, or story...etc. This type aims at organizing ideas to make it easy for the writer to turn them into a final piece of writing.

4. *Note-Taking Map*: It depends on the understanding level of the writer about the book or the topic before taking notes. The aim of this type is to take notes on a book, seminar, or lecture by first, randomly writing all the collected ideas from the sources, then, organizing them into a map.

5. *Explanation or Presentation Map*: This type allows the user to explain and present his ideas to others easily or even to himself. This type helps the writer to communicate and explain his ideas in one page and in visual form, and this will make it easier for the reader to get the ideas and understand how they are related to each other.

Mogahed (2013) also listed some other types or forms for mind maps, among them:

6. *Cause and Effect Diagrams*: This type is mostly useful for explaining how something happened.

7. *Spider Map*: It is used to describe a basic or central idea. That is to say, this form is based on putting an idea in the center and then extracts sub-ideas from it.

8. *Charts*: they are good for the sake of writing directions, also used in categorizing the different ideas.

9. *Series of Events Chain*: It is used to demonstrate the stages of something logically.

10. *Story Maps*: They are good for retelling stories, books, or plays in personal style and in a simple, understandable, and enjoyable way.

### **Mind Mapping and Technology**

Nowadays, with the technological development that served the human life in all fields, it is possible to create mind maps using computer and mobile devices. There are many mind mapping software and applications such as: X mind, Free mind, MI mind, Edraw mind, Nova mind, Mind meister, and Mind manager (Sahraoui & saadi, 2020). Aljaser (2017) confirmed that electronic mind maps (e-mind maps) facilitated the memorization of previous information and provided the learners with feedbacks. They also allowed fast revision of the topics before the test. They linked the information to colors and material items that contributed to focusing the subject in mind. In other words, they linked written information to drawings and symbols.

E-mind mapping is a beneficial to students' learning inside and out classrooms. Mohaidat (2018) claimed that electronic mind mapping helped students speed up their learning process and find knowledge faster by drawing out a diagram that illustrated the basic concept of the main and sub ideas. Electric mind maps have

proven their effectiveness in activating memory, raising the level of understanding of texts, and increasing their efficiency in organizing ideas and presenting them to others.

Using e-mind mapping gives teachers the ability to express ideas and show interrelationships between concepts and content visually in network not in linear structures that help learners to remember (Ruffini, 2008). While students were working, they were happy that they could modify and archive their e-mind mapping; they also had the ability to export it as an image for further usage. Novak & Cañas (2006) stated that e-mind maps were easy to manage and to construct items freely as well as enhanced the learner's memory.

Lin & Faste (2011) made a comparison between the traditional mind mapping and the digital one; they found that, in terms of speed, digital mind mapping is faster than the traditional one. Moreover, in terms of collaboration, using pen and paper to mind map is difficult since participants must work in a single sheet of paper and be in the same time and place, whereas in digital mind mapping users can work concurrently on a computer. Furthermore, digital mind mapping supports the clean and consistent appearance of the content, unlike pen and paper mind mapping.

Nong (2009) aimed to investigate the impact of digital mind mapping compared to traditional methods on the academic achievement and attitudes in teaching and learning. It was applied to (90) first-year students at Teacher Training Institute in Thailand. Digital mind mapping, traditional teaching, and mental drawing on paper were utilized, respectively. The study revealed that students preferred mind mapping. Additionally, computer-based mind maps were critically effective in illustrating the relationships among concepts, ideas classification, building new knowledge, problem-solving, critical thinking, and collaborative learning. Students interacted freely and expressed their creative thinking.

### **Categories of Mind Mapping Software**

Bahadori & Gorjian (2016) indicated that mind mapping software can have various forms from representations of objects to hierarchical and cyclical structures. It has been classified into five major categories according to their structures such as star web, chart matrix, tree map, chain and sketch. Boyson (2009) investigated the effectiveness of using e-mind maps in education and learning. Using e-mind maps took three forms: as a means of note taking to develop the teacher's information, as a means of presentation, and using them in the lesson and homework. The study concluded that the e-mind maps helped 80% of the students in memorizing

information. In addition, 72% of them benefited in finding the interrelation of topics, while 75% of them benefited in revision. The author suggested using e-mind maps early because they help students organize ideas during revision.

Kim & Kim (2012) conducted a study titled “Kolb's learning styles and educational outcome: using digital mind map as a study tool in elementary English class” in which they concluded that the digital mind map class was effective based on the paired t-test taken before and after the classes. Also, students represented significant improvement in the group with mind mapping. Most of them believed that the digital mind map helped them to easily find out and learn vocabularies. Digital mind map indicates various impacts on a variety of learning styles.

Aljaser's (2017) study aimed to identify the effect of using electronic mind maps on the academic achievement of the fifth-grade primary female students in the English language curriculum compared to the traditional teaching method adopted in the teacher's guide. The sample is consisted of (30) fifth-grade female students. The resulted that there were statistically significant differences between the mean scores of the experimental group and the control one in the post achievement test in favor of the experimental group. The effect size of using mind maps was high.

Masoud & Ibrahim (2017) investigated the effectiveness of using an e-mind mapping software based program in developing faculty of Education 2nd year English majors' vocabulary acquisition and use. It was concluded that the experimental group significantly surpassed the control group in the post-performance of the tests. The study also revealed that the e-mind mapping program aiming to improve students' ability to increase their vocabulary acquisition and use had a tremendously positive impact on the participants.

### • **10.3. The Relationship between Mind Mapping and English Grammar**

Mind mapping is a technique that helps a student to use all his/her mind's abilities in order to link both sides of the brain through learning. Despite that fact that grammar lies in the left side of the brain, students need a new version that moves the grammar from one side of the brain to be used in the two sides by using all brain duties such as color, image dimensions and imagination in the right side of the brain (Elkahlout, 2014).

Mind mapping can be used in language teaching and learning in general and in teaching and learning grammar in specific. It is helpful for visual learners as they are illustrative tools that assist with managing thought, directing learning, and

making connections (Stephens & Hermus, 2007). In addition, Xiujing (2016) found that mind map had positive effect on arousing students' interest in learning grammar and improving their grammar learning efficiency.

Mind mapping can be applied in grammar activity in order to make students easy to remember the structure of the material. According to Buzan (2010), mind mapping can help students recall words more effectively than using list, with improvements in memory of up to 32%. Thus, the students can use mind mapping methods to get deep meaning the grammar structure. Wibowo (2020) indicated some advantages of using mind mapping in grammar; 1) It gave the students an overview the concept of grammar material, 2) It made the grammar easier to understand, and 3) It helped the students to memorize easily the concept of English grammatical structure.

El-Kenany (2021) indicated that mind maps can be used in different stages during the lesson. For example, as a revision, when presenting a new lesson, through exercises as in fill in the blanks, and at the end of the lesson as a summary or an assessment of what students learned. It can be used with tenses, prepositions, verbs, nouns, adjectives and every aspect of English grammar. Mind maps can be used to facilitate grammar learning. Through branches and key images spread out from a central idea, it is possible for learners to organize and brainstorm the grammatical rules of a target language. Mind maps will not only facilitate understanding, but also memory. By remembering the rules and how they are related, knowledge can be stored into a long term memory. Students will be able to recall the rules better when they apply them.

### **The Advantages of Using Mind Map in Grammar Learning**

Grammar knowledge that students receive can be intuitive and visualized by using mind map. The mind map, which contains images, colors and lines, can effectively tease out the connections between the grammar knowledge points. By drawing the mind map of the main tree, students have entire grasp of the knowledge they learnt. Thus, it is helpful for students to use mind map to complete the integration of grammar knowledge (Wang, 2019).

Some studies have been carried out on using mind map technique to enhance learning English language grammar:

Elawfy (2011) aimed to investigate the effectiveness of using e-mind maps in English grammar achievement for the second-grade secondary school. It utilized the

quasi-experimental method based on two groups; an experimental group that was taught using e-mind maps and a control one that was taught traditionally. It concluded that there were statistically significant differences between the mean score of the control and experimental groups in the post-achievement test in favor of the experimental group. It recommended disseminating the culture of e-mind maps among teachers and students in the different stages as well as interest in modern learning methods supported with technology.

Harbi (2013) conducted a study that aimed at investigating the effect of using mind mapping technique on grammar mastery among tenth graders in Gaza governorates. The sample consisted of (67) male students from Hamad Bin Khaliefa secondary school north Gaza. The mind mapping technique was used in teaching the experimental group, while the traditional method was used with the control one in the second term of the school year of (2012-2013). The findings showed that there is statistically significant difference between the mean score of the experimental group and the control group in the post grammar achievement test in favor of the experimental group. The study recommended the necessity of using mind mapping technique in teaching English language grammar to improve outcomes of grammar teaching.

Gomaan (2015) conducted a study to investigate the effect of using mind maps to learn English grammar for the third secondary class students in Sabya. The use of mind maps, as an instructional tool in learning grammar, is compared to the conventional method that depends on verbal explanation and the use of student book, the board and board markers. The sample consisted of (40) students, were chosen intentionally from Damad secondary school in Sabya. The experimental group was taught using mind mapping technique. The control group was taught using the traditional method. The findings showed that there is statistically significant difference between the mean score of the experimental group and the control group in the post grammar achievement test in favor of the experimental group.

Normawati (2020) conducted a study aimed at finding out if a grammar learning strategy called digital mind-mapping (DMM) can improve learners' grammar competence. The study was conducted in Universitas Nasional Karangturi Semarang involving first-semester students taking words and phrase grammar (WPG) class. The finding showed that DMM seems to have great potential to be used in grammar classes since it helps improve the students' grammar competence.

El-Kenany (2021) investigated the effect of using mind mapping technique in improving EFL first year secondary stage students' English grammatical achievement. The participant consisted of thirty students selected from first year secondary stage of Ghazala secondary school, Sinbillawin, Dakahlia governorate during the first semester of the academic year 2013-2014. The participants were taught using mind mapping technique. Results provided evidence to the effectiveness of using mind mapping technique in improving the students' English grammar achievement.

## **11. Design of the research**

The present research used the quasi experimental design of a control and an experimental group of pre/posttest administration to investigate the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar. The experiment lasted for three weeks, according to the academic schedule. The course selected for this experiment was presented from New Hello Book.

## **12. Participants of the research**

Twenty five male and female pupils of the third year preparatory schools were chosen voluntarily from Hamed Gouher official language school, Red Sea governorate as the experimental group who were instructed by using e-mind mapping technique, while twenty five were chosen as the control group who were instructed by using the conventional method.

## **13. Variables of the research**

- **The independent variable is:**  
E-mind mapping technique
- **The dependent variable is:**  
Learning English Language grammar

## **14. Instruments of the research**

### **1. Designing the unit based on e-mind mapping technique:**

#### **A. Selecting the unit:**

The selected unit was unit (6), in New Hello Book which included (4) lessons that were built its grammatical rules on some activities and exercises for enhancing learning English Language grammar by using e-mind mapping technique.

## **B. Conducting the content analysis:**

Content analysis was a very important step before building the instruments of the research. It helped in giving objective, logical, and quantitative description of the targeted content.

### **✓ Steps of the conducting content analysis:**

1. Specifying the general aims of the unit which contains the grammatical rules.
2. To assure the validity of the content analysis, it was submitted to a jury of language teachers and supervisors.
3. Enumerating and measuring the analysis, and then giving the ranks and weights.
4. Obtaining the reliability coefficient of the content analysis. Coper formula was used to obtain the reliability coefficient which was 88%.

### **2. The questionnaire of the learning English language grammar problems:**

Based on the literature review, the researcher prepared a questionnaire related to learning English language grammar problems, which consisted of the following items:

- Do you like grammar?
- Is learning grammar difficult?
- Do your teachers use interactive techniques in teaching grammar?
- Can the use of e-mind mapping technique increase your motivation in learning grammar?
- Is e-mind mapping a creative means in learning grammar?
- Can the use of e-mind mapping technique solve your problems in learning grammar?
- Does e-mind mapping help you to study grammar easier?

The questionnaire was submitted to a jury of some TEFL specialists, who judged the relevance and suitability of those items to the participants of the research.

### **3. Designing the teacher's guide in light of e-mind mapping technique:**

The teacher's guide presents the activities and exercises that pupils should handle during the period of the experiment. It is an adaptation of unit (6) in New Hello, involving activities for using e-mind mapping technique. The following issues were put into consideration:

1. New Hello textbook focused mainly on various language activities (reading, writing, listening, and speaking).

2. E-mind mapping technique requires every pupil to sit in front of a computer to design various templates of mind maps. Thus the procedure includes some activities to teach pupils how they can learn their subjects in general and English Language grammar in specific through using mind mapping technique, which has colorful templates helping them in linking ideas and determining the relationships between items.

3. The activities include also exercises about some grammatical rules mentioned in unit (6) which some pupils suffer in learning. Thus, by using e-mind mapping, they can learn these rules easily.

The teacher's guide was judged by a jury to judge the appropriateness of the activities, the suitability of the language and the consistency of the content with the objectives. In light of the jury's suggestions, some modifications were made in the arrangement of activities and they were all included in the final version.

#### **4. The English language grammar achievement test:**

##### **➤ Aim of the test:**

The test was designed to:

- assess third year preparatory schools pupils' performance in the selected activities.
- assess the impact of e-mind mapping technique on the third year preparatory schools pupils' learning English Language grammar.
- compare between the experimental and the control groups to investigate the impact of e-mind mapping technique to that of the conventional method.
- ensure the equality of the experimental and control groups before implementing the experiment.

##### **➤ Construction of the test:**

The test was in the written form. It consists of (5) main questions comprising (20) items; one mark for each one. Question (1) is a "multiple choice" exercise where the pupils are supposed to choose the correct response from (a, b, c, or d). The question consists of five items and is assigned (5) marks. Question (2) is a "complete the dialogue" exercise where the pupils are asked to complete the space. The question consists of three items and is assigned (3) marks. Question (3) is a "rewrite the

sentence as shown in the brackets" where the pupils are asked to rewrite the sentence according to the request given between the brackets in each statement. The question consists of five items and is assigned (5) marks. Question (4) is a "correct the underlined mistake" exercise where the pupils are going to correct the underlined mistake in each statement. The question consists of five items and is assigned (5) marks. Question (5) is a "write a paragraph" exercise where the pupils are supposed to write a paragraph about specific items.

➤ **Scoring the test**

- One mark was given for each correct answer.
- The total test score were (20).

➤ **Instructions of the test**

The instructions of the test were presented in English. They were brief, simple to understand and free from any possible ambiguities. They contain information about the aim of the test, time allowed to complete the test and the types of the questions.

➤ **Piloting the test**

○ It was conducted prior to the real administration of the test. Thirty pupils were chosen from third year preparatory schools pupils to participate in this application. Those pupils were excluded from participating in the real experiment. The piloting aimed to:

- Ensure the clarity of instructions,
- Suitability of the linguistic level of the participants, and
- Determine the validity, reliability and duration of the test.

○ In light of the pilot study, it was found that period of (45) minutes would provide enough time to answer the test. In addition, the results confirmed the clarity and the suitability of the test items to the pupils.

○ The test was submitted to the jury members to report its validity. There was a consensus that it was covered the unit content, the aim and the learning outcomes.

○ The reliability of the test was determined by using Cronbach Alpha formula. The reliability coefficient of the test was (0,865) and significant at (0,01) level.

The researcher determined the test time by calculating the average of the time as follows: **Test Time** = answer time of the first student + answer time of the last student

## 15. Procedures of the experiment

To execute the experiment, the following procedures were done:

### ➤ Pre testing

To achieve homogeneity between the experimental and the control groups, the researcher divided the participants into two equivalent groups based on the results of the English language grammar achievement pre-test. Results ensure that there are no statistically significant differences between the mean scores of the experimental and the control groups in the pre-test.

**Table (1)**  
**Differences in the mean scores of both groups in the English language grammar achievement pre-test**

Administration	Groups	No.	Mean	Standard Deviation	Degree of Freedom	"T" Value	Significance
Pre testing	Control	25	6.6400	1.220	48	.760	NS
	Experimental	25	6.3600	1.287			

Maximum score= 20

Table (1) shows that according to the results obtained from the pre-test of English language grammar achievement, it was revealed that there was not any significant difference between the mean scores obtained by the experimental and control groups.

### ➤ Teaching

The researcher taught unit (6) to the experimental group using e-mind mapping technique. Every participant of the experimental group used a computer in the lab and tried to design mind maps according to the activities they had to practice.

### ➤ Post testing

After teaching the content, the English language grammar achievement test was re-administered in order to measure the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar.

## 16. Results and findings

The quasi experimental design of the research depended on comparing the pupils' scores of the control and the experimental groups in the English language grammar

achievement post-test, and comparing the experimental group scores in the English language grammar achievement test before and after learning by using e-mind mapping technique. The researcher analyzed the quantitative data using “T” test formula.

➤ **Testing Hypothesis (One):**

- There are statistically significant differences between the mean scores of the experimental and the control groups in the post-test of the English language grammar achievement favoring the experimental group. Table (2) shows "T-value" and the participants' mean-scores.

**Table (2)**

**Differences in the mean scores of both groups in the English language grammar achievement post test**

Administration	Groups	No.	Mean	Standard Deviation	Degree of Freedom	“T” Value	Significance
Post testing	Control	25	16.880	1.332	48	31.816	0.05
	Experimental	25	6.600	.912			

Maximum score= 20

According to the data in table (2), "T" value (31.816) is significant at (0.05) level. This finding affirms and supports hypothesis (one) and indicates that the experimental group surpassed the control group in the post-test of the English language grammar achievement. It is clear that e-mind mapping technique has a strong positive impact on the experimental group’s English language grammar learning.

➤ **Testing Hypothesis (Two):**

- There are statistically significant differences between the mean scores of the experimental group in the pre/posttest of the English language grammar achievement favoring the post administration. Table (3) shows "T-value" and the participants' mean scores.

**Table (3)**  
**Analysis of the experimental group scores in the pre/post testing**  
**of the English language grammar achievement**

Administration	No.	Mean	Degree of Freedom	Standard Deviation	"T" Value	Significance
Pre	25	6.6400	24	1.220	30.745	0.01
Post		16.880		1.332		

Maximum score= 20

According to the data in table (3), "T" value (30.745) is significant at (0.01) level. This finding affirms and supports hypothesis (two) and indicates that the experimental group surpassed in the post-test of the English language grammar achievement. It is clear that e-mind mapping technique has a strong positive impact on learning the participants' English language grammar.

## 17. Discussion

The present research investigated the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar. The results obtained from the post-test indicated that the experimental group achieved significant enhancing in learning English grammar after being instructed through e-mind mapping technique. That could be due to the advantages of using e-mind mapping in learning grammar such as: 1) e-mind mapping made grammar easier to understand, and 2) e-mind mapping helped the pupils to memorize easily the grammatical structure.

E-mind mapping technique also trained them to be more creative, to organize the relationships and to link between ideas. They designed colorful e-mind maps with different styles. Besides, it was also found that the pupils could automatically strength their memory in recalling the information they have known. Thus, e-mind mapping proved to be an effective technique in learning grammar and this is line with Harbi (2013), Gomaan (2015), Aljaser (2016), and Normawati (2020).

The participants' responses in the pre-test showed that they were at a low level of grammar achievement. They did not understand the grammar formulas, and how to use it in the sentences. In addition, they are not interested to learn grammar because the teachers used bored techniques. After being instructed through e-mind mapping technique, the participants' grammar learning enhanced highly. These results due to using mind mapping which contains images, colors and lines that can effectively tease out the connections between the grammar knowledge points.

Based on the finding of this research, it can be stated that mind mapping technique was highly effective on preparatory schools pupils' learning English language grammar of the experimental group compared with control group's results. Therefore, the impact of e-mind mapping technique on preparatory schools pupils' learning English Language grammar has been verified.

#### **18. Recommendations of the research**

In light of the research results, the researcher recommends the following:

- Using e-mind mapping in the preparatory schools needs a real care.
- Integrating technology in learning is very important; as it creates a motivated environment and helps the learners to link the ideas more easily.

#### **19. Suggestions for Further researches:**

- Using e-mind mapping for enhancing critical thinking skills for preparatory schools pupils.
- Using e-mind mapping for enhancing vocabulary acquisition for preparatory schools pupils.

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