The Effectiveness of Using Mind Mapping on the 3rd Graders’ Vocabulary Learning and Improving their Visual Thinking at UNRWA Schools

فاعلية استخدام الخرائط الذهنية على تعلم مفردات اللغة الإنجليزية وتنمية التفكير البصري لدى طلاب الصف الثالث في مدارس الأونروا

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Master of Education

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أقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة ككل أو أي جزء منها لم يقدم من قبل الآخرين لنيل درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

I understand the nature of plagiarism, and I am aware of the University’s policy on this.

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted by others elsewhere for any other degree or qualification.

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نتيجة الحكم على أطروحة ماجستير
Abstract

The current study aimed at investigating the effectiveness of using mind mapping on the 3rd graders’ vocabulary learning and improving their visual thinking at UNRWA schools. To achieve the objectives of the study, the researcher adopted the quasi experimental approach. The sample of the study consisted of (79) male students from the third graders at Al-Amal Elementary Boys School in Western Khan Yunis. They were divided into two groups (experimental and control). The experimental group consisted of (39) students and the control group (40) students. The groups were randomly chosen from a purposive sample from Al-Amal Elementary Boys School. The experimental group was taught using the mind mapping strategy while the control group received traditional teaching.

The researcher used a pre-post vocabulary and visual thinking tests to achieve the objectives of the study. The vocabulary test consisted of eight questions and the visual thinking test consisted of 22 multiple choice items.

The data of the study were analyzed using t-test independent sample, to determine significant differences between the two groups. Effect size and Eta square were also used to measure the effect size of mind mapping strategy.

The results of the study revealed that there are statistically significant differences at (α = 0.01) in the mean scores of the experimental and control groups in the vocabulary posttest due to the use of mind mapping in favor of the experimental group. Second, there are statistically significant differences at (α = 0.01) in the mean scores of the experimental and control groups in the visual thinking posttest due to the use of mind mapping in favor of the experimental group.

Based on the findings of the study, the researcher recommends that curriculum designers and decision makers integrate the mind mapping strategy in curricula and design materials and hold workshops for supervisors about mind mapping. She also recommends supervisors to hold training courses, provide materials and books for teachers about mind mapping and organize workshops to introduce teachers to new methods of teaching including mind mapping. Furthermore, teachers are recommended to use mind mapping in teaching various aspects in English, change the traditional method of teaching, develop visual thinking skills in all aspects of English and other subjects using mind maps and present new methods in teaching vocabulary.
ملخص الدراسة باللغة العربية

هدفت الدراسة الحالية إلى التعرف على فاعلية استخدام الخرائط الذهنية في تعلم مفردات اللغة الإنجليزية وتنمية التفكير البصري لدى طلاب الصف الثالث في مدارس الأونروا، وتحقيق أهداف الدراسة اعتمدت الباحثة المنهج شبه التجريبي وطبقته على عينة بلغت (79) طالباً من مدرسة ذكرى الأمل الإبتدائية - غرب خانيونس، حيث تم اختيارهم وتقسيمهم بشكل عشوائي إلى مجموعتين تجريبية وضابطة، تكونت المجموعة التجريبية من (39) طالباً والمجموعة الضابطة من (40) طالباً.

استخدمت الباحثة أدوات لتحقيق أهداف الدراسة وهم اختبارين قبلي وعدي للمفردات ومهارات التفكير البصري، تكون اختبار المفردات من ثمانية أسئلة بينما تكون اختبار مهارات التفكير البصري من سؤال اختياري من متعدد مكون من 22 فقرة.

وقد كشفت نتائج الدراسة عن وجود فروق ذات دلالة إحصائية عند ($\alpha = 0.01$) بين متوسطات المجموعتين التجريبية والضابطة في اختبار المفردات البعدي لصالح المجموعة التجريبية، و كذلك كشفت عن وجود فروق ذات دلالة إحصائية عند ($\alpha = 0.01$) بين متوسطات المجموعتين التجريبية والضابطة في اختبار مهارات التفكير البصري لصالح المجموعة التجريبية.

بناءً على نتائج الدراسة أوصت الباحثة أسلوبية المناهج و أصحاب القرار بضرورة مصممي المناهج و أصحاب القرار بضرورة دمج استراتيجية الخرائط الذهنية في المناهج و تصميم مواد و عقد ورشات عمل للمشرفين ليقوموا بدورهم بتعرف المعلمين على هذه الاستراتيجية، كما وأوصت المشرفين بعدم ندوات و توفر موارد وكتب عن الخرائط الذهنية و أوصت المعلمين بضرورة استخدام الخرائط الذهنية في جوانب اللغة الإنجليزية المختلفة و ضرورة تطوير مهارات التفكير البصري لدى الطلاب واستخدام طرق جديدة في تدريس المفردات.
Dedication

With heartfelt gratitude and affection, I dedicate my work to:

- My parents, who are a model of success and hard work,
- My dear husband and soul mate for encouraging and supporting me during the period of the study,
- My daughters for loving me unconditionally and for bearing with me all this hardness,
- My brothers and sister for being supportive,
- My dear friend Duaa Abu Moor for helping and encouraging me and to
- Everyone who supported and encouraged me.
Acknowledgments

My deepest gratitude, appreciation and thanks go to Allah for granting me health and power that helped me continue despite the difficulties I have been through.

Many thanks and appreciation are due to my supervisors Prof. Abdol-Mo’ty Al Agha and Prof. Walid Amer for being thoughtful and kind and for helping me get this work to reality.

All appreciation and warmest thanks are extended to the referee committee for their feedback and recommendations particularly Mr. Ahmad Al Abbasi and my educational specialist at UNRWA Mohammed Al Astal for giving me advice and answering all my questions.

I am also grateful to the Islamic University Staff for their support.

I would like to extend my heartfelt gratitude and special thanks to my family specifically my mum, my husband and my daughters for praying for me, for their unceasing support and trust and for their supportive and encouraging acts.
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Chapter 1
Background of the study
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1. Introduction

Vocabulary is an essential part of the English language. There is no language without vocabulary. It is important for communication, reading, speaking, listening and writing. Thus, vocabulary learning is an important process that never stops.

Vocabulary learning can be a challenging process because in order to master a language very well, one must equip himself with a good amount of vocabulary knowledge. Without knowledge of words, understanding sentences or passages is not possible. (Mohammadi & Shakouri, 2014, p.1166).

One of the major problems that most students face is their inability to recall or keep the vocabulary items they have studied. Richards & Renandya (2002) as cited in Karimi & Heidari (2015, p.54) state that, “without having a comprehensive body of vocabulary and clear cut strategies for acquiring new vocabulary, learners often fail to fulfill their potentials and may lose their enthusiasm in using opportunities available around them.”

According to Waring (2002) cited in Davoudi & Yousefi (2016, p.106), “our brain is designed to forget something, not to remember. It seems that we should devise methods and techniques which empower our learners to recall the words a longer period of time and help them to permanently acquire the vocabulary.”

This problem can be attributed to the students’ negative attitudes towards learning English, which can have a bad influence on the learning process. Not having an opportunity or the lack of practice plays a major role too. Vocabulary received little attention in the past because it was thought that it would be acquired naturally with the language, so speaking, listening, reading and writing received all the attention.

According to Nation (2001, p.4): “learning vocabulary is a cumulative process and it must be deliberately taught, learned and recycled. This is critical for several reasons: 1) learners need to encounter the words in a variety of rich contexts, often requiring up to sixteen encounters, 2) learners remember words when they have manipulated them in different ways, so variety is essential for vocabulary teaching,
and 3) learners forget words within the first twenty-four hours after class, so it is important to follow up a vocabulary lesson with homework that recycles the words.”

The teaching method plays a crucial role in helping students retain vocabulary. Teaching English as a foreign language requires the use of effective learning and teaching methods that will empower the students to master the required tasks.

Based on Atay & Ozbulgan (2007) as cited in Davoudi & Yousefi (2016, p.106) “the learners need to be given explicit instruction of vocabulary learning strategy to facilitate their awareness of vocabulary learning strategies they can use to learn on their own outside the classroom.”

Thus, the question is what can teachers do to promote and support students’ vocabulary retention or what strategies to use? One of the strategies that can be used is mind mapping. Mind mapping was first popularized by the British psychology author and TV personality Tony Buzan in the late 60s. It was designed to help students take notes effectively, brainstorm, solve problems and plan projects.

Mind mapping is “a graphical technique for visualizing connections between several ideas or pieces of information. Each idea or fact is written down and then linked by lines or curves to its major or minor idea or fact, thus creating a web of relationships.” (business dictionary)

Tony Buzan defines mind maps in his book “the mind map book” as “an expression of radiant thinking and is therefore a natural function of the human mind. It is a powerful graphic technique which provides a universal key to unlocking the potential of the brain.” (Hoeve, n.d., p.2)

Furthermore, Hofland (2007) as cited in Sahrawi (2013, p.240) argued that mind mapping is a technique that stimulates both parts of the brain, the left side is used for rational and logical thinking whereas the right side is used for creative thinking.”

Simply put, it is a technique that is comprised of a natural structure that starts from the center and uses lines, symbols, words, colors, and images. Mind mapping helps students get engaged. Casco (2009, p.6) states that the map acts as a playbill announcing what comes next and draws the learners’ attention to the topic. According to Liu (2016, p. 204), “they are necessary to improve students’ practical application ability.” In other words, it makes the students use English. It lets them learn divergent
thinking. So when they use English, they automatically remember relevant mind maps to express themselves.

Mind maps help develop students ability to comprehend and understand the meaning of a text. (Bahadori & Gorjian, 2016, p.9). They also activate prior knowledge, encourage learners to ask questions, scaffold reading, listening comprehension, speaking, written production, assess oral production, they help students present many English vocabulary in interesting ways, they are attractive, and they help students memorize the words in a short period of time and remember them easily.

As it is comprised of colors, shapes, images and symbols, mind mapping has a great effect on improving visual thinking skills. They make ideas come alive. The old saying, “a photo is worth a thousand words” is certainly true as a mind map with photos, sketches, and data visualizations provide an alternative way to express and share complex ideas.” (Collias, 2014, p. 2)

Strictly speaking, one believes that teaching vocabulary and improving visual thinking skills by using mind mapping can be effective and helpful for both teachers and students in the process.

2. Statement of the problem

Vocabulary is one of the vital elements of English for second language learners to master. Language learning starts with learning meanings and words; thus students can have difficulties in remembering vocabulary. Most students find it difficult to use vocabulary in speech or writing. Though many techniques were used to teach English vocabulary. Because our educational system is mostly verbal and there is a neglect of the visual thinking part in education, the researcher chose the mind mapping technique which involves creating visual diagrams of ideas and words to find out how much it affects vocabulary learning and visual thinking improvement. Thus, the major question is:

What is the effectiveness of using mind mapping on the 3rd graders’ vocabulary learning and improving their visual thinking?
3. Minor questions:

1. How is the mind mapping strategy applied?
2. What are the vocabulary intended to be taught to both experimental and control groups?
3. What are the visual thinking skills intended to be improved?
4. Are there statistically significant differences at \( (\alpha \leq 0.05) \) in the mean scores of the experimental and control groups in the vocabulary test?
5. Are there statistically significant differences at \( (\alpha \leq 0.05) \) in the mean scores of the experimental and control groups in the visual thinking test?

4. Hypotheses

1. There are no statistically significant differences at \( (\alpha \leq 0.05) \) in the mean scores of the experimental and control groups in the vocabulary post test.
2. There are no statistically significant differences at \( (\alpha \leq 0.05) \) in the mean scores of the experimental and control groups in the visual thinking post test.

5. Purpose of the study

The study aimed at:

1. Identifying the mind mapping strategy and how it is applied.
2. Identifying the vocabulary taught to both experimental and control groups.
3. Identifying the visual thinking skills intended to be improved.
4. Investigating and exploring the effectiveness of using mind mapping on third graders’ vocabulary learning and on improving their visual thinking.
5. Measuring the effect size of mind mapping strategy and the change in the third graders’ achievement in vocabulary learning and the improvement of their visual thinking.

6. Significance of the study

The study may benefit:

1. Teachers

   It helps teachers become aware of the individual differences. It makes them reconsider and reflect upon their teaching methods. It also helps them overcome the difficulties that encounter their students. It attracts teachers’ attention to the
importance of using mind mapping in teaching vocabulary and improving visual thinking. It also opens doors for using it in different aspects of English.

2. Students
   It encourages and motivates them to learn eagerly. It attracts their attention and makes the process of memorizing vocabulary fun and easy. Furthermore, it creates a cheerful, positive and motivating atmosphere.

3. Decision makers
   It attracts decision makers’ attention to the importance of integrating new and modern methods in the curriculum for the betterment of the quality of teaching and education.

4. Supervisors
   It is hoped that the study will encourage supervisors to conduct training courses and sessions for the teachers on how to use mind mapping to teach various aspects of English.

5. Researchers
   It encourages researchers to conduct further studies on the effect of mind mapping on various fields and subjects other than English.

7. Limitations of the study
   The study was conducted within the following limitations:
   1. The study was conducted on a sample from the third grade male students enrolled in the academic year 2017/2018 at Al-Amal Elementary Boys School (UNRWA) at Western Khan Yunis.
   2. The study was conducted in the first term of the academic year 2017/2018.
   3. The study was limited to teaching the vocabulary of English For Palestine 3 A.
   4. The study was limited to teaching vocabulary in units (7 and 8).

8. Definition of terms
   1. Effectiveness
      It is the degree of improvement in both vocabulary learning and visual thinking skills of the Gazan third graders due to mind mapping strategy.
2. **Mind mapping**
It is a graphic thinking tool with a natural organizational structure that radiates from the center. It uses symbols, pictures, colors and lines. It was used to teach Gazan third graders vocabulary.

3. **Vocabulary**
It is the vocabulary included in units 7 and 8 in English for Palestine 3 A that were taught through mind mapping.

4. **Third graders**
They are the Gazan students who are enrolled in the 3rd grade in the academic year 2017/2018. Their ages range between 8-9 years.

5. **Visual Thinking**
The researcher defines visual thinking as a mental ability that helps people visually recognize, read, differentiate, connect, explain and infer information from objects, shapes, forms or images in the space.
Chapter 2
Literature Review
Chapter 2: Literature Review

Section 1: Theoretical Framework

Introduction:

In light of the purposes of the study which aimed at investigating the effect of using mind mapping on the third graders’ vocabulary learning and improving their visual thinking skills, the researcher divided this chapter into two sections. The first section is the theoretical framework which includes three domains. The first domain is mind maps, the second one is vocabulary and the third is visual thinking.

The second section reviews some previous studies that other researchers conducted concerning mind maps, vocabulary and visual thinking. Brief details are given, suggestions as well as recommendations of their studies are drawn through the discussion, then the researcher gives her comments on those previous studies.

First Domain: Mind maps

1. Definition of mind mapping.

Mind mapping which is also known by many names such as visual mapping, flaw charting, visual thinking and spider diagramming, is according to Casco (2009, p.1) “a graphic tool which contains a central key word or image and secondary ideas that radiate from the central idea as branches.”

Buzan (2006, p.135) defines it as “a graphic, networked method of sorting, organizing and prioritizing information (usually as paper) using a key or trigger words and images, each of which will ‘snap on’ specific memories and encourage new thoughts and ideas.”

Krasnic (2011, p.48) also defines mind mapping or visual maps as “a graphic tool used to collect, create, manage and exchange information. It represents information via the special organization of concepts, topics, ideas, words, or other items linked to and arranged in a radial pattern round a central concept.”

According to Buzan (1994, p.59), “the mind map is an expression of radiant thinking and is therefore a natural function of the human mind. It is a powerful graphic technique which provides a universal key to unlock the potential of the brain.”
Thus, it can be said that mind mapping is a graphic thinking tool with a natural organizational structure that radiates from the center. It uses symbols, pictures, colors and lines.

2. Origins of mind maps.

History shows that mind maps were used many centuries ago. They were used for learning and problem solving by many thinkers such as Leonardo Da Vinci, who used pictures, symbols and lines as a way to express his thoughts on paper. The pictures he used helped him explore his thoughts in many fields such as arts, horoscopes, machines and biology. In the late sixteenth century and the earlier seventeenth, Galileo Galilei helped experts to revolutionize knowledge through his note taking technique. Furthermore, Richard Feynman (a noble prize winner in physics) used to place all his theories of quantum and electrodynamics into visual and new diagrammatic forms.

According to Hawrani (2011, p.14), even Prophet Mohammed peace be upon him used to use simple drawings to convey his ideas and messages which can be called simple mind maps. It was narrated from Abdullah bin Masud that the Prophet drew a square, and a line in the middle of the square, and a line outside of the square, and he said: “Do you know what this is? They said: “Allah and his messenger know best.” He said: “Man is the line in the middle, and these lines to his side are the sicknesses and problems that assail him from all places. If one misses him, another will befall him. The square is his life span, at his neck, and the line outside is (his) hope.” (Sunan Ibn Majah)

In the late 60’s, mind maps were developed by the British psychologist Tony Buzan in an attempt to move away from the traditional method of note taking. Buzan used different aspects of mind mapping that may help people create their own note taking in a non-linear fashion. Those mind mapping aspects included using landscape paper, branches, symbols, colors, and central images.

This way a person will use both hemispheres (left and right), thus the brain will be in its peak. Hofland (2007) cited in Sahrawi (2013, p.240) argued that, “mind mapping is a technique that stimulates both parts of the brain, the left side is used for rational and logical thinking whereas the right side is used for creative thinking.”
It is clear that mind maps were used a long time ago. They were used in a more simple way than it is today. This is an indication of its importance and an evidence of its simplicity and suitability for all ages.

3. Types of mind maps.

According to Buzan (2006) cited in Hawrani (2011, p.17), there are many types of mind maps, these are:

1. Dyadic mind maps: those maps are made by drawing two radiant branches in the center.
2. Poly categoric mind maps: these maps can contain from three to seven branches. Because the average mind cannot remember more than seven pieces of information in the short term memory. One of the advantages of this type is that it helps develop the mental powers of classification and categorization.
3. Group mind maps: it is designed by bringing individuals together in mind mapping groups. According to Buzan (1994, p. 166), “the mind map becomes the external reflection, “the hard copy”, of the emerging group consensus and subsequently becomes a group record or memory. Through this process, the individual brains combine their energy to create a separate “group brain”.
4. Computerized mind maps: these are designed through using computers. There are lots of mind mapping soft wares that help draw careful and cheerful mind maps such as, imind map which was designed by Tony Buzan, Free Mind, Mind Genius, Mind Jet, Nova Mind and lots more.

There is a difference between hand drawn mind maps and computerized mind maps or mind mapping software which should be mentioned. Table (2.1) shows the differences.
Table (2.1): hand drawn maps versus computerized mind maps/ mind mapping soft wares.

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<td>A. No Cost.</td>
<td>A. Cannot be digitally stored other than as a scanned document.</td>
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<td>B. No restrictions on map design and layout.</td>
<td>B. Map size is limited.</td>
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<td></td>
<td>C. May create map anytime with pencil and paper.</td>
<td>C. Preference of user for mind mapping software advantages.</td>
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<td>D. Each map is a unique creation of the user.</td>
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<td>E. Collaboration is possible if colleagues are together in the same place</td>
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<td><strong>Mind mapping software</strong></td>
<td>A. Ability to link to other information such as hyperlinks and notes.</td>
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<td>B. Ability to modify and filter map Easily.</td>
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<td>D. Ability to create templates easily.</td>
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<td></td>
<td>E. Ability to allow real collaboration.</td>
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<td></td>
<td>F. No size limits.</td>
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</table>

It is clear from the previous table that each type of mind maps has its merits and demerits. It is the choice of the student or the user to decide which type to use based on the task he/she is doing.

4. Steps of making mind maps:

As mentioned earlier, mind maps can be drawn by hand or using software. When creating a mind map, there are several elements to consider including the map’s central image, colors, branches, images and key words. According to Buzan (2006, p. 162), these elements are as follows:
1. Focus on the core question, the precise topic. Be clear about what it is that you are aiming for or trying to resolve.

2. Turn your first sheet of paper sideways in front of you (landscape-style), in order to start creating your mind map in the center of the page. This will allow you freedom of expression, without being restricted by the narrow measure of the page.

3. Draw an image in the center of the blank sheet of paper to represent your goal.

4. Use color from the outset, for emphasis, structure, texture, creativity - to stimulate visual flow and reinforce the image in your mind.

5. Now draw a series of thick lines, radiating out from the Centre of the image.

6. Curve your lines because they are more interesting to your eye and more memorable to your brain than straight ones.

7. Write one key word on each branch, that you associate with the topic.

8. Add a few empty branches to your Mind Map. Your brain will want to put something on them.

9. Next, create second-and third-level branches for your related associated and secondary thoughts. The secondary level connects to the primary branches, the third level to the secondary branches, and so on.

The previous steps can be simply summarized in drawing a central image or idea, then drawing branches and writing related words to the central idea inside them. The use of colors, pictures and symbols is important and more fun.

5. Characteristics of mind maps:

Mind mapping is a highly effective way of getting information in and out of the brain. It is a creative way of note taking. It uses many pictures, many colors, key words to present ideas and information in clear classification. It also uses association which makes it easier for the information to be remembered because students associate it with information that has already been known. According to Buzan (1994, p. 59), mind maps have four basic characteristics; these are:

a. The subject of attention is crystallized in a central image.

b. The main themes of the subject radiate from the central image as branches.
c. Branches comprise a key image or key word printed on an associated lines. Topics of lesser importance are also represented as branches attached to a higher level branches.
d. The branches form a connected nodal structure.

Kacafírková (2013, p.15-17) reported in his thesis, that there are four important features and characteristics of mind maps. They are:

1. **Structure**: it is obvious that mind maps support non linearity and it is known for its hierarchical structure.
2. **Motivation**: motivated students are more interested in the topic they learn and therefore they are willing to devote their time to learning activities, so mind mapping is a great way to increase their attention.
3. **Personalization**: mind mapping allows students to organize their thoughts and ideas based on their personal experience and feelings.
4. **Creativity**: mind maps promote creativity since they are connected to art. They revolve around using colors, pictures and symbols which allows students to think creatively.

Based on the characteristics of mind maps, it can be concluded that if mind maps were used to the fullest in education particularly in teaching - learning English, the results would be of great importance.

6. **Advantages and disadvantages of mind maps:**

Each and every teaching method has its advantages and disadvantages.

1. **Advantages of mind maps:**

   a. Strictly speaking, mind mapping is one of the simplest and easiest ways to take hold of thoughts and bring them to life. Thus, it is considered easy to add ideas to as if you were adding branches to a virtual tree.
   b. In my experience, one of the most important advantages is clarity. The connections between key concepts are obvious from their proximity and closeness to one another. The brain works primarily with key concepts that it links and integrates. Mind maps work in the same way, thus the process of recalling and reviewing will be faster and more effective.
c. The nature of mind mapping is a great aid to creativity because the use of colors, pictures, symbols and images can boost it, thus giving a feeling of happiness and joy.

d. It makes the study process easier and memorable. According to Byrnes (2010, p. 3), “mind mapping increases learning and retention by up to 95% over conventional note taking. The structure of mind mapping is fashioned after the way the human brain actually thinks, which is radiantly.”

e. It balances the brain: Edward (n.d.) stated that, “mind maps allow you to concentrate because both hemispheres of the brain are trained to be balanced and active at the same time.”

f. According to Menn (2013, p.4), it is more interesting and entertaining than writing a report or drafting a standard chart or table.

g. It saves time: “we save up to 95% in time in many different ways, we save time by writing only the relevant, key words instead of taking painstaking notes and worrying about grammar, punctuation and sentence structure.” Byrnes (2010, p.4)

h. Organization: Hoeve (n.d., p.2) stated that, “it is a great method to categorize and organize the brainstormed ideas and identify their relationship.”

i. Connections and associations: Buzan (1994, p.233) argued that, “unlike linear text, mind maps show not just the facts but the relationships between those facts, thus giving the students a deeper understanding of the subject.”

2. Disadvantages of mind maps:

   Despite the fact that mind mapping is a wonderful way of note taking, it has its share of drawbacks.

   a. An individual map can be so personal, that it is difficult for others to understand.

   b. According to Edward (n.d.), change can be difficult for some people. It is not easy to change the way of doing things and changing from the linear system to a very different one requires a great effort that some people are not ready to make.

   c. Lack of knowledge: according to the author of the pros and cons of mind mapping for marketers (2013, p.4), key words and links are great if there is enough basic knowledge on the topic at hand to make associations. But if the topic is new, then a lack of information on the page can lead to a mind map being ineffective.
d. Space: using mind maps requires using one page. Some subjects might need more than one page, so it is irritating that one cannot add information to a category because there is not enough space.

e. According to Menn (2013, p.3), mind maps become more complex if more than two branches are added.

f. Strictly speaking, active participation is required to understand a mind map. Although mind maps are self-explanatory, some people find it a little difficult to make sense out of it because of not witnessing or participating in its creation.

It is clear that everything has its own advantages and disadvantages. This applies to mind maps because, as mentioned earlier, it has its own share of both sides. Teachers should use it in the best way they can in order to foster students’ creativity and critical thinking and expand their horizons and points of view towards looking for new techniques to make their learning easier and enjoyable.

7. Applications of mind maps in teaching:

Creating an atmosphere that engages students in learning is not always easy. Thus, teachers can use mind maps in different ways to make the process easier. The following are some applications of mind maps in teaching:

1. Preparing lecture notes: according to Hawran (2011, p. 18), “preparing a lecture in a mind map form is much faster and easier than writing it. This way allows both teacher and student to grasp the whole subject at a glance.” Furthermore, Buzan (1994, p. 224) stated that, “as a framework for lecturing, a mind map enables the speaker to hold a perfect balance between a spontaneously spoken and fresh talks on the one hand and a clear and well-structured presentation on the other hand.”

2. Curriculum Planning: teaching depends on well organized planning. With new curriculum, planning can become tiring. Using mind maps helps in planning the year in sequence. Buzan (1994, p. 224) argued that, “the mind map can be used to give the teacher an overview of the whole year’s study programme, showing the term divisions and the types of the lessons to be given.”

3. Term planning: “this is a subdivision of the yearly plan, and often takes the form of a smaller mind map expanding from a branch or branches on the yearly programme. The term plan might show which topics from the curriculum the teacher intends to cover and in roughly what order.” (Buzan, 1994, p. 225)
4. Delivering lessons: mind maps can successfully be used in presenting new lessons in the classroom as they hold the students’ interest and enhance their memory and retention.

5. Creating handouts: based on 7 mind mapping uses for teaching, mind maps will form a great tool if used in creating classroom handouts as they contain colors, images, shapes and visually appealing layout of a mind map engages students instantly.

6. Creating games, quizzes and questionnaires: Brandner (n.d., p.8) stated in her article that, “the use of mind maps is not limited to brainstorming and project planning. All kinds of games, quizzes and questionnaires can be used.”

7. Presentations: mind maps are a very useful tool in presenting a complicated subject or content to the students. When drawn in front of students, they can follow the teacher’s flow of ideas and their relationships and when finished, students can finally get the lesson.

8. Assessment and examination: it is important to assess knowledge after every lesson. Mind maps are a key tool for this concept. It can show the teacher at a glance whether or not the student understands the subject, as well as their strengths and weaknesses. The mind map also reveals those areas where the chain of thinking has gone wrong.

9. Projects: a mind map is a beneficial format that can be used to create a visual overview of a project. Mind maps are perfect for planning, monitoring and presenting projects. They foster and encourage comprehension and focused thinking in the early stages.

In my experience as a teacher, all these applications of mind maps can easily be employed in teaching. In order to create an engaging, cheerful environment and an easy learning journey, such a technique should be exploited to the best.

8. What can be taught through mind maps?

1. Speaking.

Speaking is one of the most important language skills that need to be developed. As speaking is vital in communication and in expressing thoughts, feelings and opinions, students need to master this skill. Thus, the teacher needs to adopt various techniques to help the students. An example of these techniques is mind mapping.
Based on AlJarf (2011, p.11), whose study shows how a mind map software is used in grouping words on the basis of sound-symbol associations, “mind maps can be used in introducing, categorizing, visualizing and reviewing phonics rules and spelling mnemonic devices students develop related rather than isolated knowledge of phonics rules and develop skill in differentiating phoneme-grapheme associations in spoken and written representing.”

The use of lines, symbols, pictures, colors, and words in creating mind maps makes both hemispheres of the brain work and because the brain is naturally attracted to beauty; this will ease the path towards successful communication.

In brainstorming for a speaking task, students are provided with blank maps that have a central idea. Students may add an image to each branch. This way they make associations before speaking. A mind map is useful for speaking because a student can place the main topic in the middle and brainstorm ideas around it as in figure (2.1).

![Mind Map Example](https://www.ieltsbuddy.com/ielts-mind-map.html)

Figure (2.1): a mind map about a lake

Source: [https://www.ieltsbuddy.com/ielts-mind-map.html](https://www.ieltsbuddy.com/ielts-mind-map.html)

It is clear from figure (2.1), that the subject of the speaking task is about a lake. In this task, the students brainstormed ideas related to the lake such as: where is the lake? Why did they visit the lake? What did they do? Who visited the lake? And so on. Another variety is finding images to suit speaking maps. Students are given full mind maps of speaking topics the teacher has created. Students’ job is to find images
that suit the maps. When they find the images they get in pairs and execute their speaking task.

3. **Listening**:

   Listening is the first step or skill needed to acquire a language. It is a vital skill because without it there is no language. The more we listen, the more our hearts and minds are ready to speak.

   Listening and speaking are very dependent on each other. Teaching second language learners listening can be hard sometimes. So, the question is how can mind maps be used to teach listening?

   Following Guinan (2015, p.5-7), mind maps can be used in listening lessons as follows:

   a. They can be used for general predictions before a listening text. This way, students are given a mind map with a central idea and different colored branches or a central idea and students add their own branches and ideas.

   b. Using mind mapping for more focused predictions work. The map has a central idea and main branches, students are asked to add sub-branches thereby they develop the listening theme and predict what the lesson is.

   c. Using mind maps for predicting language: a map is provided to the students with a central idea and branches broken to parts of speech. Students must predict the nouns, verbs, adjectives and adverbs they may expect to hear.

   d. While listening: students are given a map with a central idea and main branches already filled in. The students will listen and add key vocabulary that they hear to suitable branches.

   e. After the listening experience: Guinan (2015, p.6) also states that, pairs of students could ask each other to describe what happened in the listening text and map out their partner’s responses. After that, students can share their maps to the whole class and decide which map was accurate, detailed and interesting.

4. **Reading**

   Clarke (1980) cited in Ardakani and Lashkarian (2015 p. 1077) calls reading, “the most thoroughly studied and least understood process in education today.” It is known that most students become reluctant when it comes to reading. The lack of vocabulary plays a great role that causes this feeling.
Using visual illustrations including pictures, colors, symbols and the like helps students make connections and associations. This is obvious in what Beare (2017, p.2) said, “mind maps provide a visual learning mechanism that will help students recognize relationships they may miss in a more linear type pf activity.”

For example, the map can be used to show relationships between characters or places in a story. It can also be used to improve reading comprehension by asking students to complete a mind map as revision or in formative and summative tasks. Furthermore, it helps teachers in explaining or presenting texts.

Cadieux (2011, p.1) stated that, “mind mapping can be used to improve reading comprehension in both fiction and non-fiction texts and a cross a variety of genres. Mind maps work because they give the reader another (visual) way to process information.”

She also argued that, “for non-fiction texts, the mind map should contain the main idea in the center, branching out to supporting ideas and facts (…) if using a mind map, students should be asked to use the center of the mind map for the title of the book or piece of text.”

Strictly speaking, mind mapping can be used in various stages in the reading task. This depends on the teacher’s ability to manipulate and change the strategy to suit the type of the reading task.

5. Writing

Writing is a challenging skill. It has always been a trouble for students. Its difficulty lies in the fact that it encompasses different aspects of language. Furthermore, students need time to think of ideas and connect these ideas together to come up with a good text. The linear fashion of ideas is usually used. Thus, students find difficulty in organizing ideas specially when there are too many of them.

Mind maps help students begin their writing since it takes brainstorming to a new level and involves students in a roadmap for their ideas. Mind maps are better used in the pre writing stage. This is confirmed by Hdi (2015, p.2), “for writing effectively, mind maps have to be used in the pre writing stage as it is the stage related to planning and brainstorming.”
The mind map then is used as a framework for writing the whole text. It is also very useful in exploring any topic in writing. In addition to that, Bukhari (2016, p. 62) adds, “mind maps allow gathering concepts in relation to the main theme. The concepts gathered this way are coherent without the linear or inflexible structure of outlines, clustering or listing ideas, the use of mind maps can present information using images, symbols, keywords, codes and color to the level one wishes to do.” Figure (2.2) shows the process of brainstorming ideas about water.

Figure (2.2): brainstorming ideas about water


Figure (2.2) shows a writing task about water. For this task, students need to brainstorm ideas about water in order to write a composition such as water cycle, importance of water, water sources and so on.

6. Grammar

The best way to teach grammar has been in the spotlight and is considered an issue for teachers especially in the context of EFL. Grammar is very important in language learning. According to Suseno and Setyawan (2014, p.497), “when the students 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.”

Strictly speaking, learning grammar can be troublesome for some students, so many researchers proposed different methods to teach it including mind maps. As teachers, 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, design a mind map about… and at the end of the lesson as a summary or an assessment of what students learned. It can be used with tenses, parts of speech, prepositions, verbs (to be, to do, to have, modals …so on), nouns, adjectives and every aspect of English grammar. The following figures show example mind maps concerning grammar including the present simple tense, parts of speech and prepositions.

Figure (2.3): a mind map about the present simple tense.

Source: [http://www.grammarmindmaps.com/Present-Simple.jpg](http://www.grammarmindmaps.com/Present-Simple.jpg)
Figure (2.3) shows a present simple tense mind map. This map can be used in various stages of the grammar lesson. It can be used as a revision, a summary of the lesson at the end or as an introductory map for presenting the tense and the teacher explains each branch on its own.

![Mind Map of English Parts of Speech](https://www.biggerplate.com/mapimages/xl/FI2rJ0yd_English-Grammar-Parts-of-Speech-mind-map.png)

**Figure (2.4): a mind map about parts of speech**

Source: [https://www.biggerplate.com/mapimages/xl/FI2rJ0yd_English-Grammar-Parts-of-Speech-mind-map.png](https://www.biggerplate.com/mapimages/xl/FI2rJ0yd_English-Grammar-Parts-of-Speech-mind-map.png)

![Mind Map of Prepositions](http://www.grammarmindmaps.com/Mind_Map_Prepon_of_Place1.jpg)

**Figure (2.5): a mind map about prepositions**


Figures (2.4) and (2.5) about parts of speech and prepositions respectively can be used as an introduction to the lesson, a revision and a summary.
Strictly speaking, as a teacher using mind maps with grammar specially tenses is quite interesting. The researcher applied this method previously with seventh graders. It was easy and the students had much fun plus it is a new way of learning that students can count on.

9. The difference between mind maps and concept maps.

Mind maps and concept maps are two types of visual mapping that can be confusing. They are often thought to be the same, but they are actually different.

Frey (2016, p.2) defines concept maps as follows: “a concept map or conceptual diagram is a diagram that depicts suggested relationships between concepts. It is a graphical tool that instructional designers, engineers, technical writers and others use to organize and structure knowledge.”

This means that the main purpose of concept maps is showing relationships. Thus, the main topic in the concept map may have multiple branches (parents and children) which allows the explanation of more complex relationships.

One of the most important characteristics of concept maps is that the concepts are represented in a hierarchical order with the general concept at the top and the specific ones at the bottom.

According to Novak and Canas (2008, p. 1), “they include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts. Words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts.”

When it comes to the main differences between concept maps and mind maps, Duffil (2013, p. 5) stated some differences and complementary strengths for each, these are as follows:

a. Mind maps can grow much larger than concept maps.
b. Mind maps are much better at visually and mentally dividing things up into different contexts and areas of focus. A concept map is more usually considered as a whole.
c. Mind maps are better at visualizing patterns.
d. Mind maps are quicker to create than concept maps.
e. Concept Maps are designed to be clearly read one proposition at a time, whereas many mind maps can only be skimmed to give a flavor of the subject.

f. Much of the knowledge and insight behind a mind map often remains in the author's head(s) (…) concept maps are self-contained and self-explanatory, so are better suited to sharing real knowledge with non-authors, without a limited shelf life.

g. The connections between concepts in a concept map are always explicit. The connections between ideas in a mind map are rarely explicit. Figure (2.6) summarizes the differences and similarities between mind maps and concept maps.

![Figure (2.6): the differences and similarities between mind maps and concept maps.](https://www.flickr.com/photos/philippeboukobza/8608133034)

According to figure (2.6), there are similarities and differences between both methods. When it comes to the similarities, the figure indicates that both methods organize and represent knowledge, they are one page method, they are both context dependent, they improve comprehension and memorization, they both use colors and are hierarchically structured. For the differences, figure (2.6) summarizes them as follows:
1. Key concepts in mind maps are written on branches but in concept maps they are enclosed in a box.

2. Linking lines in mind maps are not labeled while in concept maps they are.

3. General concepts in mind maps are at the middle however in concept maps they are at the top of the map.

4. Icons and visual metaphors in mind maps are extensively used while in concept maps they are limited.

5. There is balance between logic and creativity in mind maps while in concept maps they are used more.

6. Mind maps were developed by Tony Buzan while concept maps were developed by Joseph D. Novak.
Second Domain: Vocabulary

1. Vocabulary Definition:

Vocabulary is an important component of foreign language learning. In fact, languages emerge as words either written or spoken. The process of creating and learning never stops, we even learn new words and meaning in our mother tongue. Vocabulary is an important element in conveying meaning, thoughts, feeling and messages. So what is vocabulary?

According to the online Cambridge English Dictionary (2017) vocabulary is defined as, “all the words known and used by a particular person or all the words that exist in a particular language or subject.”

Pikulski and Templeton (2004, p.1) argued that, “it is almost impossible to overstate the power of words; they literally have changed and will continue to change the course of the world history. Perhaps the greatest tools we can give students for succeeding; not only in their education but more generally in life, is a large, rich vocabulary and the skills for using those words.”

Keshta and Al Faleet (2013, p.47) also mentioned that, “words are the tools we use to think, to express ideas and feelings, and to learn about the world.”

According to Pyle and Alges (1970, p.96) cited in Wafi (2013, p.24), “vocabulary is the focus language with its sound and meaning interlock to allow us to communicate with one another and it is words that we arrange together to make sentences, conversations, discourses of all kinds.”

Sedita (2005,p.1) argues that, “vocabulary encompasses all the words we must know to access our background knowledge, express our ideas and communicate effectively, and learn about new concepts.”

Burgess (2015, p.1) also defined vocabulary as, “a set of words within a language that are familiar to a particular person.”

From the above mentioned definitions, the researcher defines vocabulary as a group of words that form a language. They are used to convey thoughts, feelings, expressions and messages.
2. Importance of vocabulary:

Vocabulary is central to English language learning. It is a key to success. Williams (2013, p.1) asserted that, “vocabulary itself is multifaceted and should be considered as part of the larger language structure and use, involving spelling, pronunciation, and grammatical behavior.”

According to Al Qahtani (2015, p.22), Wilkins (1972) stated that, “there is not much value in being able to produce grammatical sentences if one has not got the vocabulary that is needed to convey what one wishes to say while without grammar, very little can be conveyed, without vocabulary, nothing can be conveyed.”

Al Qahtani shares the same idea, “vocabulary knowledge is often viewed as a critical tool for second language learners because a limited vocabulary in a second language impedes successful communication.”

For most foreign language learners, being able to communicate is the ultimate goal. Therefore, mastering vocabulary is not only important but focal and crucial.

Vocabulary has a great effect on English language skills: listening, speaking, reading and writing because the relationship between learning vocabulary and learning language is very strong.

According to Pekka (2013, p.1), Nation (1994) believed that, “vocabulary is not an end in itself. A rich vocabulary makes the skills of listening, speaking, reading and writing easier to perform.”

Thus, in English as a foreign language (EFL), vocabulary plays a vital role in all language skills (i.e. listening, speaking, reading and writing).

In addition to the above mentioned, vocabulary is important for self judgment because every time someone speaks, people judge the words and expressions not the language. It also gives a better image, as people learn more words, they are able to better use them in a communicative way. Learning words with their various colors (genres, connotations and meanings) is interesting. This eventually displays a good intelligent image.

Without sufficient vocabulary, students will not be able to understand others or express their ideas and thoughts. Schmitt (2010, p.4) observed that, “learners carry around dictionaries and not grammar books.” This confirms the fact that if a student
or anyone has a useful amount of words without being grammatically competent, they would be able to communicate. This is supported by what Wilkins said that, “without grammar, very little can be conveyed, without vocabulary, nothing can be conveyed.”

The researcher concludes that learning vocabulary is crucial for learning any language. It is difficult to listen, speak, read or write without possessing vocabulary knowledge.

3. Types of vocabulary:

There are various ways to classify vocabulary. Based on Wafi (2013, p.28-29) Sims (1989, p.91-96) classified vocabulary into four types:

1. Listening vocabulary:

A persons’ listening vocabulary is all the words they can recognize when listening to speech.

2. Speaking vocabulary:

A persons’ speaking vocabulary is all the words they use in speech.

3. Reading vocabulary:

It is all the words a person can identify when reading. It is the best type of vocabulary because the reader gets to be exposed to a great amount of words.

4. Writing vocabulary:

They are the words that are used in writing whether it is formal or informal.

5. Focal vocabulary:

It is a specialized group terms and distinctions that are particularly used by a specific group.

Another classification of vocabulary:

Kailani and Muqattach (1995, p. 151-156) classified vocabulary into the following:

a. ESP vocabulary: ESP is English for specific purposes which is used in certain fields whether professional or technical. It is best learned in connection with the job or profession.
b. **Active and Passive vocabulary:** active vocabulary is used in daily speech. It is learned through commination with others. Meanwhile, passive vocabulary is not used in every day speech. It is only meant for recognition and understanding.

c. **Content words:** they convey meanings. They are main verbs, nouns, adjectives, adverbs etc.

d. **Function words:** they are a part of the grammatical system. They are not used to convey meanings. They are only important for the sentence structure and they do not change the sentence meaning. They are like the, a, an, conjunctions etc.

Although there are many classifications and types of vocabulary, the researcher believes it is important to say that for students what really matters is the ability to understand and extract meaning from the word and being able to use it in different contexts.

4. **Difficulties in learning vocabulary**

Teaching vocabulary to foreign and second language learners can be of great difficulty to both teachers and learners. According to Al Qahtani (2015, p.23), “a vocabulary system is perceived to be a cause of difficulty by learners.”

The difference between the mother tongue and the target language and the influence of the first on the second are a cause of most errors committed by students.

Low motivation can present a difficulty to students, because the desire of learning for those students is very low. According to Kailani and Muqattach (1995, p. 150-151), “there are two issues that affect teaching and learning vocabulary. These are the teachers’ competence and the communication oriented approach.” The competent teacher is able to present language adequately using many techniques followed by an activity that fosters the new knowledge. Unfortunately, this is not the case with most teachers. The communication oriented approach has added a burden to the teachers’ job, because the teacher is required to contextualize the vocabulary and give adequate exercises and use useful and fun techniques. This would be of great difficulty to the poorly trained teachers.

What also makes it hard for the students to learn vocabulary is the fact that they have no rules so students do not know which vocabulary item is needed to be learned first. Furthermore, vocabulary was neglected. It did not gain attention and importance until recently. Thus, the low attention it received and the bad planning that did not
match its importance affected vocabulary learning. In addition to that, the focus was on the form and meaning not on usage. This of course hinders the process because learning vocabulary depends on using contexts and different methods to teach and learn it.

For language learners particularly foreign, students only use vocabulary during the class. They do not use it outside and there is not any other subject that is taught in English for the students to use.

According to Thornbury (2004, p. 27-28), there are other factors that make other words more difficult than others:

- Pronunciation: words that are difficult to pronounce are more difficult to learn.
- Spelling: sound-spelling mismatches are more likely to be the cause of errors.
- Length and complexity: long words seem to be no more difficult to learn than short ones.
- Grammar: the grammar associated with words can be problematic such as the emotive verbs enjoy, love or hate which are followed by an infinitive or –ing can add to its difficulty.
- Meaning: words that overlap in meanings such as make and do cause problems.
- Range, connotation and idiomaticity: words such as put is used widely compared to impose. The word propaganda has a negative connotation while the equivalent means publicity. Idiomatic expressions are even more difficult than words with direct meanings such as (keep an eye on, make up your mind...)

In addition to all these difficulties, there is the problem of memorization. Students do not have the ability to memorize or maintain words in their minds, which affects their speaking and reading.
5. Strategies for teaching vocabulary

Vocabulary can be taught using different techniques and strategies depending on the nature of the vocabulary needed for the lesson, teacher and students. The first thing that a teacher thinks of when teaching vocabulary is using a strategy that helps students memorize and remember.

Eid (2014, p. 20-22) mentioned some strategies used for teaching vocabulary:

1. The Grammar Translation Method:

   Using GTM in teaching vocabulary implies using word lists and translation. According to Thornbury (2004, p.77), “translation has the advantage of being the most direct route towards meaning assuming that there is a close match between the target word and its L1 equivalent.” The researcher believes that translation is best used as a last resort when students seriously fail at knowing the meaning. The overuse of translation also makes students fail at developing their vocabulary learning techniques.

2. The Direct Method:

   Realia, real objects or demonstration are all used in teaching through the direct method. Strictly speaking, this method is widely used in the primary level.

3. Communicative Language Teaching (CLT):

   Communicative language teaching revolves around creating a communicative atmosphere and a natural authentic environment. Many techniques can be used in teaching vocabulary such as: role play, conversations, miming, games, information gap activities. Based on Al Qahtani (2015, p.26) Brewster, Ellis and Girard (1992) mentioned some techniques for teaching, they are:

   a. Using objectives.
   b. Drawing.
   c. Using illustrations and pictures.
   d. Contrast.
   e. Enumeration
   f. Miming, expressions and gestures.
   g. Eliciting.
   h. Translation.
Mind mapping, is one of the most effective strategies used in teaching and learning various aspects of English.

6. Mind mapping and vocabulary:

The strategies of teaching vocabulary including the grammar translation method, the direct method and communicative language teaching used to be effective. Nowadays, such strategies are not satisfactory on their own. Additionally, what was once suitable might not be so again. Learners’ needs are increasing by time; they need to be competent in all four skills of English in addition to mastering vocabulary in order to keep up with the requirements of their time. Hence, mind mapping is considered one of the best strategies to be used in teaching vocabulary.

Based on the researcher’s experience, the researcher used mind maps in teaching both primary and middle school levels. The researcher believes that it is very appropriate specially if used in teaching young learners. It is a fun and enjoying way of learning English particularly vocabulary. Colors, symbols, and pictures are all used. This technique provokes the student’s brain and creativity, both hemispheres of the brain work thus helping students to learn better. Moreover, mind mapping is not limited to teaching vocabulary, but it can be used in teaching grammar, writing, listening, speaking etc. Thus, the question is how can mind mapping be applied in teaching vocabulary? To answer this questions, here are some ways of applying mind maps.

1. Brainstorming:

Strictly speaking, the researcher believes that mind maps are most widely used as a brainstorming technique. New ideas and thoughts can be obtained from students. The teacher writes a word in the center for example the word weather and students come up with ideas and related words. The teacher writes them on the branches of the mind map. Everything is written on the board. Brainstorming can also be used as a revision technique at the beginning of the class or at the end. The teacher writes the word on the board and elicits related ideas and asks the students to match each word with its picture or the opposite. Another variation is, the teacher erases some words or removes few pictures from the mind map and students start remembering and completing the mind map again. Strictly speaking, this way is very enjoyable for students particularly if pictures were involved.
2. **Presenting vocabulary:**

Based on my experience as a teacher, using mind maps in presenting vocabulary is very easy. It is done through few steps. The teacher draws the mind map on the board (in the middle) where every student is able to see clearly. The teacher then elicits the topic of the lesson. The teacher introduces the words one after the other with their pictures and then put them on the map. Students guess the meanings through pictures. Another variation is that the teacher writes the word in the mind map in the middle and starts eliciting words related to the central word or idea.

3. **Vocabulary games:**

Although mind maps are visual tools, they can be used in creating vocabulary games. According to Kacafírková (2013, p. 55-56), the creation of vocabulary games through mind maps is very easy. She explains the human mind map game related to house vocabulary as follows: the teacher puts a picture of a house on the floor. He/she selects students each one of them is given a word card. Students together should form the branches of the house mind map. For example, students are given the following cards: living room, watch, TV, read, the, newspaper, have, lunch, do, the, washing up, kitchen. It can be a competition. The first team should create a living room branch and the second a kitchen branch. The team that finishes the branch first wins. Now the student with the word living room stands next to the word house, then holds the hand of the student with watch and read cards. The one with (watch) holds the hand of the one with (TV) and so on.

4. **Vocabulary activities:**

Strictly, mind maps can easily be used to design vocabulary activities. For example, complete the missing letter. The teacher designs the map with the words missing a letter and students complete it. The teacher can also add pictures. Another variation is fill in the blanks where the teacher puts the words in brackets and the mind map contains the pictures and students should write the word next to the picture. This way it is easier and more fun for both students and the teacher.

It is obvious that mind mapping can be used in various ways and stages of any lesson depending on the topic, students’ level and age and the teacher. The previously mentioned ways can be manipulated and adapted in a way that suits the situation.
Third Domain: Visual thinking

Thinking is a process of mental activity that everyone does in order to solve problems. It is a supreme mental and psychological process that differentiates humans from animals. There are many kinds of thinking. This section deals with visual thinking, its definition, importance, skills, tools, processes, the relationship between visual thinking and mind maps and developing visual thinking skills.

1. Definition of visual thinking

Everyone understands words. They can be transformed immediately to pictures, sounds and color. Visual thinking is familiar to us. Mcloughlin and Krakowski (2001, p.1) confirmed that, “visualization is familiar to us from common usage and fundamentally means to form and manipulate a mental image,” It is connected to our daily life one way or another. It is used as a tool to represent knowledge. It has always been an important part in learning and teaching English. So what is visual thinking?

The online psychology dictionary defined it as “ a form of non-verbal thought that is most commonly used in musical, mathematical and kinesthetic thinking. People tend to do most of their thinking in words, rather like a one-sided conversation, but non-verbal thinking is a process of thinking and reasoning in pictures and images. It is considered an intuitive, emotional and creative mode of thought.”

According to Mange et. al. (2015, p. 210), “ visual thinking is termed as spatial thinking / pictorial / right brain thinking and learning that happens with visual information processing.” In addition, Ibrahim (2006, p.9) mentioned that, “it is a type of thinking that provokes the brain by using visual stimuli.”

Abed Al Saheb and Affon (2012, p.177) mentioned that, ‘it is a system or a group of processes that enables individuals to visually read shapes, transform this reading to a verbal or written language and infer information.”

Furthermore, Tseng (2011, p.1) said, “ spatial or visual skills incorporate a person’s ability to visualize and mentally transform or manipulate an object in space.” Based on the previous definitions, the researchers defines visual thinking as a mental ability that helps people visually recognize, read, differentiate, connect, explain and infer information from objects, shapes, forms or images in the space.
2. Importance of visual thinking

After reviewing some related literature, the researcher can conclude the importance of visual thinking as follows:

1. It provokes deeper thinking.
2. It organizes information in the brain.
3. It promotes and supports vital communication among group members.
4. It helps students understand the visual stimuli surrounding them.
5. It increases the student’s mental capacity since it is a good way of opening the door for critical, creative and constructive thinking.
6. It promotes students’ comparing, analyzing and inferring skills.
7. It promotes the ability of problem solving.
8. It attracts students towards learning.
9. It indirectly develops a liking towards reading particularly if pictures were involved.
10. It supports new methods of sharing ideas and collaborative work.
11. It makes memorizing and recalling an easy process.
12. It helps students understand abstract concepts better.

3. Visual thinking skills

After reviewing a number of previous studies and books related to visual thinking like Mahdi (2006), El Kahlout (2012), Jabr (2010), Al Deeb (2015), Abed Al Saheb and Affon (2012) and Ammar and Al Qabani (2011), the researcher concluded that visual thinking skills help students to visually read, discriminate, analyze any object visions with knowledge. These skills are:

a. Visual reading: the ability to identify the nature and dimensions of a picture or an object. It is the lowest skill of visual thinking.

b. Visual differentiation: the ability to identify/recognize an image or a shape and distinguish it from others.

c. Realizing and connecting spatial relationships: the ability to see, analyze and connect relationships.

d. Explaining information: the ability to explain and clarify the meanings of words, symbols and signs.
e. Inferring meaning: the ability to infer new meanings, concepts and principals through the displayed image, shape or map. This skill is the outcome of the previous ones.

In light of the previous studies, the researcher was able to determine that these are the skills needed for her study because they are sequential and suitable for the third graders.

4. Visual Thinking Tools

Visual thinking tools help understand thoughts and depict the relationships between ideas. They are a way of graphically representing ideas. According to Abed Al Saheb and Affon (2012, p. 179-180), visual objects can be represented by three tools:

a. Images which is the most accurate tool in communication and connection.

b. Symbols and signs they are represented by words. They are abstract and are more common.

c. Graphics they are used by graphic artists, they can be:
   - Images.
   - Concept maps.
   - Arbitrary drawings such as flowcharts, grids and geometric shapes.

Based on the researcher’s experiences, she added the following tools to the previous ones:

a. Mind maps
b. Concept maps.
c. Flowcharts
d. Diagrams
e. Sketches
f. Clustering

These tools can be used individually, in pairs, small or large groups. The researcher believes that any drawing, doodling or sketching that involves organizing ideas, provoking deeper thinking and helps learning is a tool of visual thinking.

According to Williams (2005, p.20-21), the importance of visual thinking tools comes from the fact that:
a. They show the big picture. They are beneficial in showing every aspect of a certain topic.
b. They hold thoughts fast.
c. They focus thinking for example Venn diagrams that help us find similarities and differences.
d. They encourage children to express connections.
e. They stimulate speaking and writing because they provoke students to articulate their ideas through speaking and writing.

5. Developing Visual Thinking

According to Badawi (2008, p. 158-161), El Kahlout (2012, p. 48) and Ahmad (2016, p.37), there are many activities for promoting and developing visual thinking:

a. Paper folding activities.
b. Matchstick activities.
c. Block activities.
d. Computer activities.
e. Art activities.
f. Graphic activities.

Ammar and Al Qabani (2011, p. 37-39) also mentioned strategies and ways to develop visual thinking, they are:

a. Strategies that depend on designing linear figures (lines, colors, space, light and shade).
b. Puzzles: they include activities that depend on seeing, imagination and drawing such as paper folding, blocks and match sticks.
c. Problem solving strategies: they depend on questions and discussions.
d. Computerized concept maps.

The researcher believes that there are more ways that help promoting visual thinking in English:

a. using flashcards.
b. Drawing pictures.
c. Transforming vocabulary into drawings or symbols.
d. Using videos.
e. Using colors.
6. Visual Thinking Processes

According to Obaid and Affana (2003, p. 43), visual thinking depends on the following two processes:

a. Vision: that is the use of sight to identify things and understand them.
b. Imagery: the process of creating new images by using past experiences and imagination.

7. Visual Thinking vs Verbal Thinking

We can express thought in two ways. One is visual thinking and the other is verbal thinking. People who think by imagining or seeing pictures are visual thinkers and those who think with words are verbal thinkers. When comparing the two ways of thinking, one will find that our educational system is purely verbal. Visualization is generally neglected even though both ways of thinking play a great role in gaining and constructing knowledge.

According to McLoughlin and Krakowski (2001, p.3), table (2.2) shows a comparison between visual and verbal thinking.

<table>
<thead>
<tr>
<th>Verbal Representation</th>
<th>Visual Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>May reflect temporal and logical relations among events and objects</td>
<td>Depicts spatial logical and typographical relations between objects or events</td>
</tr>
<tr>
<td>Arbitrary and sequential, is based on semantic coherence</td>
<td>Non arbitrary: visual representation may resemble actual object and events</td>
</tr>
<tr>
<td>Linear, one dimensional exposition of Ideas</td>
<td>Dynamic and continuous, can characterize multiple aspects of ideas and concepts</td>
</tr>
</tbody>
</table>

(Adopted from McLoughlin and Krakowski, 2001, p.3)
It can be seen that although visual and verbal thinking are different, they are interrelated, integrated and complete each other because a person can do both types of representations.

8. Visual Thinking and Mind Mapping

Mind mapping is considered a great visual thinking tool that is used to clarify, organize and regenerate ideas using visual diagrams, pictures, symbols and colors. It emerged on the hands of the thinking guru Tony Buzan in the 1960s as mentioned earlier. Buzan tried to find easier ways to take notes and express thoughts directly on paper so he came up with mind maps.

The interest in representing thoughts visually started back in the 60s since then visualization developed quiet well towards creativity. If we look around us we find visual representations everywhere (symbols, signs, pictures). We can see the relationship between mind mapping and visual thinking from the fact that both of them depends on colors, symbols, signs, pictures and images (one leads to another).
Section 2: Previous Studies

Introduction:

This section of the second chapter includes previous studies concerning the variables of the study. The first part includes studies related to mind mapping and commentary. The second part includes studies related to vocabulary and commentary. The final part includes studies related to visual thinking and commentary.

1. Studies related to mind mapping:

Hussein (2017)

The study aimed at investigating the effectiveness of mind maps in developing creative thinking of preschool children. The study adopted the experimental approach. The study sample consisted of (60) children (males and females) divided into an experimental and a control group of (30) children in each. The tools used in the study were: socio-economic level scale, Goodenough Harris IQ scale, Torrance test of children’s creative thinking and mind mapping program prepared by the researcher. The results of the study indicated that:

1. There are statistically significant differences in the mean scores between both groups in the creative thinking posttest in favor of the experimental group.
2. There are no statistically significant differences in the mean scores of the control group in the creative thinking pre-posttest.
3. There are statistically significant differences in the mean scores of the experimental group in the creative thinking pre-posttest in favor of the posttest.
4. There are no statistically significant differences in the mean scores of the experimental group in the creative thinking post/following up test.

Abu Diak (2016)

The study examined the effect of using mind maps and conceptual maps on the achievement and development of creative thinking skills for the sixth grade students in science in Qabatiya. The study adopted the quasi experimental approach and design. The sample consisted of (70) female students. It was divided into (35) students in the experimental group and (35) in the control. The tools used in the study were an achievement test that contained (34) items and a measurement of creative thinking that contained (7) items. The study results revealed that there are statistically
significant differences at (α = 0.05) between the average scores in the achievement test in favor of the experimental group. The researcher suggested using mind maps and concept maps in teaching.

Al Zahrani (2015)

This study aimed at exploring the effectiveness of using mind maps to learning English grammar in the future tense to third year students in secondary schools, Sabya, Saudi Arabia at the three levels of Bloom’s Taxonomy (Knowledge, Comprehension and Application). The study adopted the quasi-experimental method during the second semester of the academic year 1435 – 1436 AH. The sample of the study consisted of (40) students, who were chosen intentionally from Damad Secondary School in Sabya. The sample was divided into two groups Experimental and control. The results of the study revealed that:

1. There are statistical significant differences in the students’ achievement between the experimental group and controlled group at the knowledge level in favor of the experimental group.
2. There are statistical significant differences in the students’ achievement between the experimental group and controlled group at the comprehension level in favor of the experimental group.
3. There are statistical significant differences in the students’ achievement between the experimental group and controlled group at the application level in favor of the experimental group.

The researcher recommended the necessity of using mind maps in teaching grammar, the necessity of holding training course for teachers and for further studies he suggested conducting studies that investigate the effect of mind maps in different stages of his study.

Buran and Filyukov (2015)

This study sought to describe the use of mind mapping technique in language classrooms. The framework of this study was to conduct the course “General English” taught at National Research Tomsk Polytechnic University, form objectives, design tasks, select mind maps and applying them in the process. The sample of the study contained (50) sophomore technical students.
A questionnaire was used as a tool to find out the students’ attitudes towards using mind maps. The results of the study revealed that (90%) of the students developed their skills in reading, writing, plan making, problem solving, preparing presentations and speaking in public. (98%) of the students preferred to use mind maps to capture information rather than reading lengthy boring texts. (2%) found it hard to create a mind map. The results also revealed that the use of mind maps is significant in giving students different opportunities. The study also clarified some of the advantages of using mind maps. For example, it provokes creative thinking and idea generating, it connects details together, it encourages collaborative work, and the natural, hierarchical structure of mind maps helps to understand a lot of information.

Hdii (2015)

The study searched for the extent to which the use of mind mapping can affect students’ writing. A comparative study was used. The sample consisted of (50) students in each group. The tool of this study was a test of writing a composition. The analytic rating scale was used to score the test. It focused on rating organization, content and language. When it comes to language, the results showed that there were no differences between the two groups. So in this respect, mind mapping did not contribute much to language. Meanwhile, the content is different. The two groups had statistical differences concerning the content. Regarding organization, the experimental group outperformed the control one. The researcher concluded that mind mapping had a significant effect on students’ writing.

Heidari and Karimi (2015)

This study sought to find out the effect of mind mapping on vocabulary learning and its retention. The sample consisted of 40 Iranian male high school students from two classes in Shahed High School in Hamedan, Iran. They were distributed into two groups i.e. the experimental and control groups. A vocabulary pre-post test and a delayed posttest were used as a tool. The results revealed that there was a difference between the performances of both groups in the posttest. The experimental group that was taught by using mind mapping had higher scores than the control group. The results also revealed that the strategy helped the students acquire and retain vocabulary directly and strongly. In the end, the researchers suggested using mind
maps in other aspects such as acquisition of idioms and collocations and their retention and other fields.

**Kusuma (2015)**

The purpose of the study was to investigate the effectiveness of mind mapping technique on the vocabulary mastery of the second grade students of elementary school. The study adopted the a quasi-experimental approach with non-equivalent-groups pre-post test design. The population of the sample was the second grade students. The sample consisted of two classes for the experimental and control groups. The results of the study revealed that there were no significant differences between the students who studied using mind mapping and those who studied with word lists.

**Sari and Pulungan (2015)**

The study inspected the effectiveness of using mind mapping strategy on the students’ achievement in writing procedure text. The study adopted the experimental approach. The sample of the study was divided into experimental and control groups. The tool used in the study was writing procedure text. The results of the study showed that there were differences in the mean scores between both groups in favor of the experimental group. Thus, the mind mapping strategy was very effective as a method of teaching procedure texts. The researcher suggested that teachers should use mind maps in teaching procedure texts.

**Sahrawi (2013)**

The study aimed to find out the effectiveness of mind mapping for teaching English vocabulary. The study adopted a pre-experimental research, one group pre-posttest design. It was conducted in SMP Negeri 3 Sungai Kakap in the academic year 2012/2013. The sample of the study was consisted of a class from the eighth grade. The tool used in this study was a written test that consisted of 25 items. The findings of the study showed that there was a significant difference between the mean score of the pre-test and post-test. This means that mind mapping was effective in increasing students’ vocabulary mastery. The researcher clarified that the mind mapping technique was a technique that can stimulate students’ creativity. The technique also aroused the students’ motivation to learn as they felt happy and had fun.
Suseno and Setyawan (2013)

The objective of the study was to investigate the effect of using mind mapping on the students’ achievement in grammar. The study adopted the quasi-experimental design; that was non-equivalent groups posttest only design. The sample of the study consisted of the students of the two 7th grade classes of SMP 06 Diponegoro Wuluhan Jember. There were (40) students in the experimental group and (37) students in the control group. The tools of the study were test, observation, documentation, and interview. The study results showed that the mean posttest score of the experimental group was (75.63158), while the mean posttest score of the control group was (70). This confirmed that there was a significant difference between the experimental and the control group. Thus, mind mapping has a positively significant effect on students’ grammar achievement. The results of the interview showed that it made the students easily remember and recall the grammar rules. The results of the observation showed that the students used mind maps in the test. The researcher recommended using mind mapping in teaching grammar.

Riswanto and Putra (2012)

The study examined the effectiveness of mind mapping strategy in the teaching of writing of the first year students of SMAN 3 Bengkulu Town in academic year 2011/2012. The study adopted the quasi experimental approach. The study sample was chosen purposively. It consisted of two classes in the total of (66) students of SMAN 3 Bengkulu town in Indonesia distributed to two groups each consisted of (33) students. The tool of the study was a writing pre-posttest. The findings of the study showed that the mean score of the experimental group was (68.1212) and the control group was (62.7727). Hence, there was a significant difference in the students’ writing achievement who were taught through mind mapping strategy. This means, mind mapping strategy improved the students’ writing achievement.

Al Jarf (2011)

The purpose of the study was to help EFL freshmen students connect spoken phonemes with their written forms using a mind mapping software. It discussed how mind mapping software can be used in EFL courses to assist students to differentiate between different pronunciations of the vowel, adding an e, pronunciation of vowel digraphs, consonant letters that have more than one sound, different pronunciations of
consonants c, cc, g, ch, s, double consonants, homophones, homographs, hidden sounds, rules for adding affixes, assimilation, elision, acronyms and abbreviations. The researcher used free mind software. Every week, the software was used to create mind maps for one phonic rule. The study showed that mind maps can be used in presenting, classifying, visualizing and reviewing phonic rules and spelling mnemonic devices. Furthermore, it showed that mind maps depend on what students know to help them understand the relationships with phonic categories. In addition, the researcher discussed that these mind mapping strategies improve word and concept knowledge as well as comprehension.

Hawrani (2011)

The aim of the study was to inspect the impact of using mind mapping strategy on the ninth grade students’ achievement in science and their attitudes towards science in Qalqilya governmental schools. The study adopted the quasi experimental approach. The study sample consisted of two schools that were purposively chosen and included (117) students. It was divided into two groups; the control group consisted of (33) male students and (27) female students, while the experimental group consisted of (30) male students and (27) female students. The researcher used three tools; teacher’s manual, an achievement test that contained (36) questions and an attitude scale that consisted of (26) items. The results of the study revealed that there are statistically significant differences in the mean differences between the students’ scores due to the teaching method. Furthermore, statistically significant differences due to gender were found between the mean scores of males and females; however, no statistically significant impact between the teaching method and the gender was found. When it comes to the attitudes, the results showed that there are statistically significant differences for the mean differences between the experimental and the control groups; no statistically significant impact was found that is attributed to the gender variable or the interaction between the teaching method and gender. In the end, the researcher recommended using mind maps in teaching.
Commentary:

It is noticeable that the current study agreed with all the previous studies when it comes to the independent variable (mind mapping). However, the study agreed and disagreed with some studies concerning the dependent variable (vocabulary and visual thinking). The study agreed with Heidari and Karimi (2015), Kusuma (2015), and Sahrawi (2013) in the effectiveness of mind maps on vocabulary. It differed with the rest of the studies in the dependent variable. For example, writing in Sari and Pulungan (2015), Riswanto and Putra (2012), Buran and Filyukov (2015) and Hdii (2015), grammar in Suseno and Setyawan (2013) and Al Zahrani (2015), speaking in Al Jarf (2011), science in Hawrani (2011), and creative thinking in Abu Diak (2016) and Hussein (2017).

Based on methodology, the current study resonated with some previous studies in using the quasi experimental approach such as Abu Diak (2016), Kusuma (2015), Suseno and Setyawan (2013), Riswanto and Putra (2012), and Hawrani (2011). However, it differed with Hussein (2017), Sari and Pulungan (2015), Heidari and Karimi (2015) and Al Jarf (2011). They all used the experimental approach, while studies like Sahrawi (2013) used the pre-experimental research and Hdii (2015) used a comparative study.

Regarding the tools, the recent study agreed with Kusuma (2015) in using pre-post vocabulary test, but it differed from the other studies. For example, Hussein (2017) used socio-economic level scale, Goodenough Harris IQ scale, Torrance test of children’s creative thinking and mind mapping program prepared by the researcher. Abu Diak (2016) used an achievement test and a measurement of creative thinking. However, Buran and Filyukov (2015) used a questionnaire, Heidari and Karimi (2015) used pre-post and delayed tests, Sari and Pulungan (2015) used writing a text, Sahrawi (2013) used a written test, Suseno and Setyawan (2013) used a test, an observation, documentation and an interview and Hawrani (2011) used teacher’s manual, achievement test and an attitude scale.

Concerning the sample of the study, the study differed from the previous studies. This study was conducted on third graders while Hussein (2017) conducted the study on preschool children, Abu Diak (2016) on sixth graders, Al Zahrani (2015) on third year secondary school students, Buran and Filyukov (2015) on sophomore

In light of the field in which the study was conducted, this study agreed with Buran and Filyukov (2015), Heidari and Karimi (2015), Kusuma (2015), Sari and Pulungan (2015), Sahrawi (2013), Riswanto and Putra (2012), Al Zahrani (2015), Al Jarf (2011), Hdii (2015) and Suseno and Setyawan (2013) they were all conducted in English. However, Abu Diak (2016) and Hawrani (2011) were conducted in science.

Regarding the statistical analysis, the current study agreed with Hussein (2017), Hdii (2015), Kusuma (2015), Sari and Pulungan (2015), Sahrawi (2013) and Riswanto and Putra (2012) in using t test to find the differences between the variables. Meanwhile, it differed with the other studies such as Abu Diak (2016), Al Zahrani (2015) and Hawrani (2011) they used ANCOVA. Suseno and Setyawan (2013) used one way ANOVA. Heidari and Karimi (2015) used MANCOVA.

Concerning the location of conducting the study, this study agreed with Abu Diak (2016) and Hawarni (2011). They were conducted in Palestine while Al Zahrani (2015) and Al Jarf (2011) were conducted in Saudi Arabia. Kusuma (2015), Sari and Pulungan (2015), Sahrawi (2013) and Riswanto and Putra (2012) and Suseno and Setyawan (2013) were all conducted in Indonesia. Heidari and Karimi (2015) was conducted in Iran, Buran and Filyukov (2015) was conducted in Russia and Hdii (2015) was conducted in Morroco.

Furthermore, The results of the study agreed with the results of all studies except for Kusuma’s (2015) which found out that there were no significant differences between the students who were taught by mind mapping and those who were taught by word lists.
2. Studies related to vocabulary:

Abdul Aziz & Yamat (2016)

The study aimed to identify whether or not the use of mind mapping technique increases the vocabulary list of the students and to measure the difference in vocabulary list increment among the students. The study adopted the quasi experimental approach. The sample of the study consisted of (38) students at the year 6 UKM of the SK Telok Kemang, Port Dickson, Negri Sembilan. It was comprised of (18) females and (20) males. The sample was chosen purposively. The researcher used pre and posttest for both the control and experimental groups. The study findings showed that there was a significant evidence that mind maps had increased the sample scores in the post test as compared to the pretest. The researcher recommended the use of mind maps in teaching vocabulary.

Bahadori & Gorjian (2016)

This study aimed at investigating the role of mind mapping software in developing vocabulary among EFL pre-intermediate students. The study was conducted in a pre-university center in Masjed soleyman. The sample of the study consisted of (60) learners at pre-intermediate level and with ages ranging between 17-18 who were selected after administering a vocabulary test extracted from the Interchange Language Placement Test. Each group included (30) students. The experimental group received vocabulary encompassing the passages taught through the Mind Mapping software 6. Eight passages of their reading lessons were covered in ten sessions. The control group was taught traditionally and learned vocabulary through definitions, explanation and translation. Two tests were used as tools including the vocabulary test which was used as the pre-test as well as the homogeneity test and a post-test to determine the effect of mind mapping software on developing students’ vocabulary. Results showed that the learners who used the mind mapping software outperformed the control group; however, both groups showed progress in learning vocabulary. When holding a comparison between the groups’ pre and post-test, we see that the experimental group performed better than the control group due to the mind mapping software.
Rabea (2016)

The purpose of the study was to investigate the effectiveness of augmented reality applications (Aurasma and ZooBurst) on developing third graders' English vocabulary. The study used the experimental approach. The sample of the study consisted of (69) students. It was divided into two groups the experimental group contained (34) students and the control group contained (35). The study employed three tools, they are content analysis, pre and post vocabulary test, and Augmented Reality Applications. The results of the study showed that

1. There are statistically significant differences in the mean scores of the experimental and control groups in the post vocabulary test in favor of the experimental group.

2. There are statistically significant differences at (α ≤ 0.05) in the mean score in the vocabulary achievement between the high achievers in the experimental and control groups in the post test in favor of the experimental group.

3. There are statistically significant differences at (α ≤0.05) in the mean score in the vocabulary test between the low achievers in the experimental and control groups in the post test in favor of the experimental group.

Finally, the researcher recommended that augmented reality applications should be used and integrated in the curriculum. Furthermore, schools should be provided with the necessary equipment to use augmented reality, and cooperation between curriculum designers and decision-makers to create materials based on augmented reality is needed.

Qasrawi (2015)

The study discussed the effectiveness of using context clues strategy in developing students’ vocabulary knowledge and studied the effectiveness of the strategy in equipping students with tools they might use in inferring the unknown words’ meaning from the context. The study adopted the quasi experimental design methodology. The sample of the study consisted of (40) students from a Mohammad Bin Rashid Al Maktoom Private School in Ramallah, Palestine. They were assigned randomly into two groups (experimental and control). A pre-posttest was used as a tool of the study. The results of the study showed that:
1. There is a significant difference between the experimental and control group in the post-test total score.

2. There is a difference between the means of the experimental group pre and post-test, in favor of the post-test.

In light of the results of the study, it was concluded that context clues teaching strategy enhanced students’ vocabulary knowledge. Students also showed an improvement in their ability in inferring the meaning of the unknown words.

**Abu Rezeq (2014)**

The objective of the study is exploring the effect of using multiple intelligences (MI) on developing fifth graders' achievement in English vocabulary in the Gaza Strip. The study adopted the quasi-experimental method. The sample of the study consisted of (121) female and male students which was divided into experimental and control groups. A pre-post achievement test and a teacher guide were used as tools of the study. The results of the study revealed that:

1. There are statistically significant differences between the experimental and control groups, in favor of the experimental one due to multiple intelligences.

2. There are statistically significant differences between the male of experimental group and control group in favor of the experimental one.

3. There are statistically significant differences between the female of experimental group and control in favor of experimental one.

Based on these results, the researcher recommended using multiple intelligences in teaching vocabulary.

**Eid (2014)**

The study aimed to explore the effect of teaching vocabulary through contexts on enhancing seventh graders use of new learnt vocabulary in authentic contexts. The study used the quasi-experimental approach. The study sample consisted of (67) students and was divided into two group: (experimental and control). A pre-post written and oral vocabulary test was used as a tool of the study.

The results of the study revealed that there are no statistically significant differences between the control and experimental groups due to the use of vocabulary context teaching. Finally the researcher recommended using context-based teaching in
other skills, teaching vocabulary through context among, and paying attention to writing and speaking.

**Awad (2013)**

The study aimed at finding out the effectiveness of using animation in teaching English vocabulary for the third graders in governmental schools. The study used the experimental approach. The study sample consisted of (58) female students. They were divided into experimental and control groups. The tool of the study was a pre-post vocabulary test that consisted of eight questions divided into (22) items. The results of the study revealed that there are statistically significant differences in the mean scores of the vocabulary test in favor of the experimental group in the post test. Based on the results, the researcher recommended using animation to teach vocabulary and suggested conducting more studies to investigate its effectiveness on other aspects of English such as pronunciation and writing.

**Demir (2013)**

The study aimed to give insight into the understanding of teaching and learning vocabulary and explore if the vocabulary instruction through In-class vocabulary strategies developed by the researcher were helpful for Turkish eighth grade EFL students’ English vocabulary retention in comparison to traditional vocabulary instruction.

The experimental group consisted of (66) students from two different classes and the control group was comprised of (63) students from two classes. The tools of the study were post-test and retention test design.

The study results revealed that there is a significant difference between the vocabulary retention scores of the students who were taught with in-class vocabulary strategies (Experimental Group) and those of the students who were given traditional instruction (Control Group) in favor of the experimental group.

**Keshta and Al Faleet (2013)**

The objective of the study was to investigate the effectiveness of using puzzles in developing tenth graders’ vocabulary achievement, to explore the long-term effect of the puzzles on the retention of the vocabulary and to measure the effect of the puzzles on the students’ attitudes towards English. The researchers adopted the quasi
The sample of the study consisted of (80) students divided into (40) students in each group.

The tools of the study were: pre-post and delayed achievement test, an attitude scale (pre and post) to determine the students' attitudes towards English language and a teacher guide (puzzles). The results of the study showed that:

1. There are significant differences in mean scores of vocabulary test in favor of the experimental group in the post application.
2. There are no significant differences in mean scores between the posttest and delayed test of the experimental group.
3. There are significant differences in the mean scores of the post attitude scale in favor of the experimental group, this was due to the method of using puzzles in teaching vocabulary.

Based on the results, the researchers recommended the necessity of implementing puzzles in teaching English language.

Wafi (2013)

The objective of the study was to explore the effectiveness of using animated pictures program in learning English vocabulary among the fifth graders. The study used the quasi experimental approach. The study sample consisted of (64) students.

The experimental and control groups contained (32) students each. A pre-post vocabulary test was used as a tool of the study. The findings of the study revealed that there were statistically significant differences between both groups in favor of the experimental group in receptive and productive vocabulary and the total score due to the program. The researcher recommended using the animated pictures program in teaching vocabulary and the necessity of conducting studies about the effect of the animated pictures program on other aspects of English.

Azabdaftari and Mozaheb (2012)

The study explored the effectiveness of using two vocabulary strategies, including mobile learning and flashcards, on the level of vocabulary learning of EFL students. The participants were (80) students studying English literature and Translation at BA level in a non-profit, non-governmental university in Iran. They were divided into two groups, experimental and control, with (40) students in each.
New vocabulary were taught to the students in the experimental group (those who used m-learning) and the control group (those who used flashcards) within a 7-week period. In this study, both qualitative and quantitative methods of data collection were used. The researchers used a multiple-choice test and semi-structured interviews to assess the newly learned vocabulary for both groups. The results of the present study demonstrated that using m-learning in vocabulary learning is more effective than using flashcards and it can foster the process of vocabulary learning in EFL settings.

Aghlara and Tamjid (2011)

The study aimed at finding out the effect of using a digital computer game and its role on promoting Iranian children’s vocabulary learning. The sample of the study consisted of (40) girls (six-seven years old). They were divided into experimental and control groups containing (20) girls each. The experimental group was taught through the SHAIEx digital game while the control group was taught traditionally. The tools used in this study were a vocabulary test and digital games software. The results of the study revealed that the mean score of the children in the experimental group was significantly higher than those in the control group.

Al Zahrani (2011)

The study attempted to explore the effectiveness of keyword based instruction in enhancing English vocabulary achievement and retention of intermediate stage pupils with different working memory capacities. The study adopted the quasi experimental method. The sample of the study consisted of (96) students divided into two groups. The experimental group contained (47) students and the control group contained (49) students. The tools used for the study were a pre-post vocabulary test and working memory task test. The results of the study showed that the key word based instruction had a great effect on students’ vocabulary learning and retention. Furthermore, they revealed that:

1. There are statistically significant differences at p < 0.05 between means of scores obtained by the study groups in the post vocabulary achievement test as it concerns the total score and the knowledge, comprehension, and application levels according to: difference in teaching method and differences in pupils’ working memory capacities.
2. There are statistically significant differences at $p < 0.05$ between the mean scores obtained by the study groups in the delayed vocabulary achievement test as it concerns the total score, the knowledge and comprehension levels according to: difference in teaching method and differences in pupils’ working memory capacities.

The researcher recommended using key word based instruction as a framework for developing vocabulary and conducting studies that explore the effectiveness of using key word based instruction on other language skills.

**Walters and Bozkurt (2009)**

The study aimed at exploring the effect of vocabulary notebooks on EFL students’ vocabulary acquisition. The study was conducted at the Zonguldak Karaelmas University English Language Preparatory School, in Zonguldak, Turkey. (60) students from three intact lower intermediate level (main course) classes participated. One class served as the experimental group, and the other two classes constituted the control groups (Groups A and B). In the experimental group, there were 12 males and 8 females, while in control group A there were (13) males and (7) females, and in control group B there were (10) males and (10) females. The tools used for this study were: a vocabulary notebook program, two pre-post receptive and productive vocabulary tests, free vocabulary use compositions and interviews. The results of the study showed significantly greater learning of the target words in the experimental group. They also showed a tendency to use the words in free writing compositions.

**Commentary:**

In light of the previous studies, it is noticed that the focus of all the mentioned studies was developing and improving vocabulary learning and teaching. This study agreed with the previous studies regarding the dependent variable (vocabulary). The previous studies also investigated the effectiveness of various techniques and methods on vocabulary such as: mind mapping in Abdul Aziz and Yamat (2016) and Bahadori and Gorjian (2016), puzzles as in Keshta and Al Faleet (2013), animation in Wafi (2013) and Awad (2013), in class in Demir (2013), mobile learning and flash cards in Azabdaftari and Mozaheb (2012), context clues in Qasrawi (2015), Augmented reality in Rabea (2016), contexts in Eid (2014), multiple intelligences in Abu Rezeq (2014),
digital computer games in Aghlara and Tamjid (2011), key word based instruction in Al Zahrani (2011) and vocabulary notebooks in Walters and Bozkurt (2009). This study focuses on the effectiveness of mind mapping on vocabulary learning and improving visual thinking for the third graders.

Regarding methodology, a lot of the studies used the quasi experimental approach the same as the researcher did as in Qasrawi (2015), Abdul Aziz & Yamat (2016), Abu Rezeq (2014), Eid (2014), Wafi (2013), Keshta and Al Faleet (2013) and Al Zahrani (2011). However, some studies used the experimental approach such as Awad (2013) and Rabea (2016).

Concerning the tools of the study, this study agreed with Abdul Aziz & Yamat (2016), Bahadori & Gorjian (2016), Qasrawi (2015), Awad (2013) and Wafi (2013), they all chose a pre-post vocabulary test while others such as: Abu Rezeq (2014) used a pre-post achievement test and a teacher guide, Rabea (2016) used content analysis, a pre-post vocabulary test and augmented reality application. Meanwhile, Eid (2014) used a pre-post written and oral vocabulary tests. Demir (2013) used a post-test and retention test, Keshta and Al Faleet (2013) used a pre-post and delayed achievement test, an attitude scale and a teacher guide. Azabdaftari and Mozaheb (2012) used a multiple-choice test and semi-structured interviews. Aghlara and Tamjid (2011) used a vocabulary test and digital games software. Al Zahrani (2011) used a pre-post vocabulary test and working memory task test and Walters and Bozkurt (2009) used vocabulary notebook program, two pre-post receptive and productive vocabulary tests, free vocabulary use compositions and interviews.

The populations and samples of the previous studies were various and different concerning number, age, gender and country. Some studies were conducted on preparatory students such as Keshta and Al Faleet (2013) on the tenth grade, Demir (2013) on the eighth grade, Eid (2014) on the seventh grade. At the same time, other studies were conducted on elementary level students such as Wafi (2013) and Abu Rezeq (2014) on the fifth grade, Awad (2013) and Rabea (2016) on the third grade. The researcher selected the third grade for her study.

Regarding the field in which the study was conducted, the recent study agreed with all the previous studies in the fact that they were all conducted on English Language vocabulary.
For the statistical analysis, this study agreed with most studies in using t test to find out the differences. These studies are: Bahadori & Gorjian (2016), Qasrawi (2015), Abu Rezeq (2014), Eid (2014), Awad (2013), Demir (2013), Keshta and Al Faleet (2013), Wafi (2013) and Aghlara and Tamjid (2011). However, Rabea (2016) used t test, Mann Whitney and Wilcoxon test. Al Zaharani (2011) used two way ANOVA and Walters and Bozkurt (2009) used ANOVA and Scheffe test.

Furthermore, the location or country in which the studies were conducted differs from one to another. For example, the recent study differed from studies like Demir (2013) and Walters and Bozkurt (2009) which were conducted in Turkey. Azabdaftari and Mozaheb (2012) and Aghlara and Tamjid (2011) were conducted in Iran, Al Zaharani (2011) was conducted in Saudi Arabia and Abdul Aziz & Yamat (2016) was conducted in Malaysia. Meanwhile, it agreed with the following studies in the fact that they were all conducted in Palestine, Rabea (2016), Qasrawi (2015), Abu Rezeq (2014), Eid (2014), Wafi (2013), Keshta and Al Faleet (2013) and Awad (2013).

3. Studies related to visual thinking:

Badr (2017)

This study aimed at investigating the use of mind maps in the development of mathematical correlations skills and visual thinking skills to the students of the third intermediate grade. The study adopted the semi-empirical method. The sample of the study consisted of (30) students divided into (25) in each group (experimental and control).

The tools used in the study were 2 tests: mathematical correlations skills test and visual thinking skills test. The study revealed that there were statistically significant differences between the averages of the two groups to the mathematical correlations skills test in favor of the experimental group, and there were statistically significant differences between the two groups in the visual thinking skills test in favor of the experimental group. The researcher recommended using the mind mapping strategy in teaching different subjects and in particular mathematics. She also highlighted the use of mind maps in developing visual thinking and creative thinking skills.
Hashem (2017)

The aim of the study was knowing the effectiveness of a strategy based on the integration of mind maps and web quests in learning science in developing visual thinking skills and creative problem solving in second year preparatory school students. The study adopted the quasi experimental approach. The sample of the study consisted of (160) students divided into two groups the experimental consisted of (80) students: (44) males and (36) females. The control group consisted of (80) students: (44) males and (36) females in Sadat school for boys. The researcher used two tools for the study, they are visual thinking skills test in science and creative problem solving skills test. The findings of the study revealed that there are statistically significant differences at (0.01) level between the mean scores of the experimental and control group students in the visual thinking skills posttest in favor of the experimental. There are also statistically significant differences at (0.01) level between the mean scores of the experimental and control group students in the creative problem solving skills posttest in favor of the experimental group. Furthermore, there were statistically significant correlation relationship at (0.01) level between mean scores of students on visual thinking skills test and their mean scores on creative problem solving skills post-test.

Qotob (2017)

This study aimed to find out the impact of using mind maps to teach art education on developing some artistic skills and visual thinking for primary stage students. The study adopted the quasi experimental approach. The sample consisted of (93) sixth grade students. It was divided into (45) in the control group and (48) in the experimental group. The results of the study revealed that the experimental group outperformed the control group in both visual thinking and artistic skills.

Al-Otaibi (2016)

The purpose of this study was to investigate the effectiveness of non-hierarchal electronic mind maps in developing the skills of visual thinking in the course of science among primary stage female learners.

The study adopted the quasi experimental approach. The sample of the study contained (44) sixth grade female students distributed to experimental and control groups with (22) students in each. The researcher used a pre-post visual thinking test.
The findings of the study showed that there were statistically significant differences at (indication level < 0.01) in the mean scores of both groups in the visual thinking test in favor of the experimental group. The researcher recommended the necessity of developing visual thinking skills in teaching science using mind maps and other techniques.

Ahmad (2016)

The study searched for the effectiveness of a program based on augmented reality on developing visual thinking skills for ninth graders in Gaza. The study adopted the experimental approach (one group design) with a pre-post test. The study sample contained (43) of ninth grade students at Al-Yarmouk elementary boys school (A). The results of the study revealed that there were statistically significant differences at (α = 0.01) in the mean scores of the pre-post application of visual thinking test. In addition to that, the effect size was great. In light of the results, the researcher recommended using augmented reality in teaching science.

Fayad (2015)

The purpose of the study was to explore the impact of employing two strategies of scientific stations and mental maps in developing physical concepts and visual thinking skills in science among primary fourth-graders in Gaza. The study adopted the quasi experimental method. The sample of the study consisted of (96) students from the primary fourth graders school of Khuza'a male prep refugee school of Khan Yunis governorate. The sample was divided into three groups. The first experimental group contained (32) students who studied by the scientific stations strategy, the second experimental group contained (33) students who studied by using the mental maps strategy, and the control group contained (31) students who studied traditionally.

The tools of the study were three: content analysis of the second unit (electricity and magnetism) from the fourth grade science book, and the physics concepts test consisted of (40) items from multiple-choice type, and visual thinking skills test consisted of (40) items from multiple-choice type in addition to a teacher's guide for employing scientific stations strategy in teaching and a private teacher's guide for employing mind maps strategy in teaching.
The results of the study revealed that:

1. There are statistically significant differences between the mean scores of the first experimental group studied by the scientific stations strategy and the mean scores of the control group which studied by the traditional way in the test physical concepts, and the test of visual thinking skills in favor of the first experimental group.

2. There are statistically significant differences between the mean scores of the second experimental group studied by the mental maps strategy, and the mean scores of the control group which studied by the traditional way in the test physical concepts, and the test of visual thinking skills in favor of the second experimental group.

3. The results showed that the two strategies of scientific stations and mental maps have a significant impact in the development of physical concepts and visual thinking skills in the Science subject of the primary fourth graders.

4. There are statistically significant differences between the scores of the first experimental group and scores of the second experimental group in the physics concepts post-test, in the high level at Bloom’s taxonomy, in favor of the first experimental group which studied by using scientific stations strategy.

5. There are significant differences between the scores of the first experimental group and the second experimental group scores in visual thinking skills posttest in the two skills of recognizing visual relations, and concluding meaning through shapes and drawings, in favor of the first experimental group which studied by using scientific stations strategy.

According to the results of the study, the researcher recommended that the teacher, should use strategies such as scientific stations strategy, and the strategy of mental maps due to their significant impact in the development of the physical concepts and visual thinking skills among students.

Al Deeb (2015)

The study inspected the effectiveness of using (Think-Pair-Share) strategy on the development of visual thinking and mathematical communication skills at the eighth primary graders in Gaza. The study adopted the experimental method. The study sample consisted of (54) students from Dar Al-Arqam school. The sample was divided into two groups, an experimental group that consisted of (27) students, and a
control one of (27) students. The tools of the study were two tests of visual thinking and mathematical communication skills. The results of the study showed that:

1. There are statistically significant differences at the level ($\alpha \leq 0.05$) between the mean scores of the experimental group and the control group students in the post test of the visual thinking test in favor of the experimental group.
2. There are statistically significant differences at the level ($\alpha \leq 0.05$) between the mean scores of the experimental group and the control group in posttest of Mathematical communication skills test in favor of the experimental group students.
3. There are statistically significant differences at the level ($\alpha \leq 0.05$) in the level of visual thinking for the students of the experimental group contributed to the variable level of achievement (high - medium - low) collection, and that between high and mediate in favor of high achievers, as well as between high and low achievement in favor of high achievers, and the existence of differences between the medium and low achievement in favor of medium achievers.
4. There are statistically significant differences at the level ($\alpha \leq 0.05$) in the level of Mathematical communication for the students of the experimental group depending on the level of achievement (high - medium-low), and that between high and low achievement in favor of high achievers, as well as between the medium and low achievement in favor of medium achievers.

**Mansour (2015)**

The objective of the study was to explore the effectiveness of using interactive whiteboard in the development of scientific concepts and visual thinking skills among third graders in schools and international relief agency in Rafah. The study adopted the quasi experimental approach. The sample of the study consisted of (60) male and female students, distributed to two groups. The tools of the study were note analysis, scientific concepts, and visual thinking skills test.

The study results showed that there were significant differences between the mean scores of the control and experimental groups in the scientific concepts posttest in favor of the experimental group. There were also significant differences between the mean scores of the control and experimental groups in the posttest visual thinking skills in favor of the experimental group. According to these results, the researcher
recommended using interactive whiteboard in the study of general science, and the
need to train teachers to use the interactive whiteboard.

Al Khuzaii (2012)

The study sought to explore the effectiveness of teaching visual thinking skills
by using the strategy of similarities in the principles of biology. The study adopted the
experimental approach. The sample of the study consisted of (51) students in the first
intermediate class. It was divided into (25) students in the experimental group and
(26) students in the control one. The results of the study revealed that the
experimental group outperformed the control one in the visual thinking skills test. The
researcher recommended that the strategy of similarities should be integrated with the
curriculum specifically biology.

Abdullah, Zakaria and Halim (2012)

The purpose of the study was to investigate the effect of using a thinking
strategy approach through visual representation on the achievement and conceptual
understanding in solving mathematical word problems in primary school. The study
used the quasi-experimental approach (Nonequivalent Control Group Design). The
study sample consisted of (193) students in five primary schools in Pahang divided
into (96) students in the experimental group, and (97) in the control group. The tools
of the study were pre-post achievement and conceptual understanding tests. Results
of the study revealed that students who were taught by the approach of thinking
strategies through visualization representation in mathematical word problem solving
outperformed students in traditional classes in achievement and conceptual
understanding in mathematical word problem solving. The effect size was great.

El Kahlout (2012)

The aim of the study was to investigate the effectiveness of implementing the
roundhouse strategy on developing the concepts and the visual thinking in Geography
for the eleventh grade female students in Gaza Governorate. The study adopted two
methods: the descriptive analytical and the semi-experimental approaches. The
sample consisted of (76) female students at Fahed Alahmad Al-Soubah Secondary
School in West Gaza. It was divided into two groups: (38) students in the
experimental group and the other (38) students in the control one.
The study used content analysis for the third unit of the geography textbook for the eleventh grade which is "the earth surface and its formation factors" according to the Palestinian curriculum in the (2011-2012), a teacher's guide for the roundhouse strategy that contained (13) round shapes for the third unit, a list of the geographical concepts included in the target unit, multiple choice test for the geographical concepts that consisted of (50) items and a multiple choice test for the visual thinking of (32) items as tools.

The results of the study showed that:

1- There are statistically significant difference at the ($\alpha \leq 0.05$) level in the mean scores of the experimental group and the control one in the geographical concepts post-test in favor of the experimental group.

2- There are statistically significant difference at the ($\alpha \leq 0.05$) level in the mean scores of the experimental group and the control one in the visual thinking skills post-test in favor of the experimental group.

3- The roundhouse strategy achieved a big effect in the geographical concept test at the value ($\leq 0.14$) measured by Eta square.

4- The roundhouse strategy achieved a big effect in the visual thinking test at the value ($\leq 0.14$) measured by Eta square.

5- The Roundhouse strategy is effective on developing the geographical concepts for the eleventh grade female students more than the Blake Modified Gain Rank ($1.2\leq$).

6- The roundhouse strategy is effective on developing the visual thinking skills for the eleventh grade female students more than the Blake Modified Gain Rank ($1.2\leq$).

Jabr (2010)

The purpose of the study was measuring the effect of applying metacognition learning cycle strategy on the development of the concepts and skills of visual thinking in science field for the tenth grade students. The study used the experimental method. The sample of the study consisted of (90) tenth grade students. The experimental and control groups contained (45) students each. The instruments used for the study were content analysis, teacher guide, learning and visual thinking tests. The study results revealed that there are statistically significant differences between the average of students' scores in the experimental group and the average degree of
their counterparts in the control group in testing the scientific concepts due to Metacognition learning cycle strategy. There are also statistically significant differences between the average of students' scores in the experimental group and the average degree of their counterparts in the control group in testing the visual thinking skills due to metacognition learning cycle strategy. The study also recommended the use of new strategies in teaching science and highlighted the importance of developing visual thinking skills and concepts.

Moshtaha (2010)

The purpose of this study was to explore the effectiveness of using a multimedia software on developing the visual thinking skills in Islamic education for the eighth grade. The study adopted the experimental approach. The sample of the study consisted of (78) students who were randomly chosen. It was divided into two groups (experimental and control). The instruments of the study were a visual thinking test, multimedia program and a teacher guide.

The results of the study revealed that there are significant differences between the experimental and control groups’ students in favor of the experimental group. This indicated that the program had a great effect on developing students’ visual thinking skills. The researcher recommended conducting training courses related to developing visual thinking skills for teachers of Islamic education and developing the Islamic education curriculum in a way that coincides with developing visual thinking skills.

Mahdi (2006)

Mahdi investigated the effectiveness of using educational program on the visual thinking and the achievement in technology of the eleventh grade female students. The study used the constructive approach to construct the educational program and the experimental approach to use the programs on an intended random sample. The sample consisted of (73) eleventh grade female students; (42) students in the control group and (41) in the experimental one. The tools used in the study were a visual thinking test and an achievement test. The findings of the study revealed that:

1. There are statistically significant differences at \((\alpha < 0.05)\) between the control group and experimental one in favor of the experimental group.
2. There are statistically significant differences at \((\alpha < 0.05)\) between the control group and experimental one in the achievement posttest in favor of the experimental group.

3. There is a strong sequential relation between the means of students degrees of the experimental group in the visual thinking test and their means in the achievement test.

4. The educational programs were characterized by the effectiveness of developing the visuals thinking skills in technology of the eleventh graders which was more than the rate of the modified earning for black.

5. The educational programs were characterized by the effectiveness of developing the achievement of technology in the eleventh graders which was more than the rate of the modified earning for black.

**Longo et. al. (2002)**

This study aimed at investigating the effect of visual thinking networking on promoting problem solving achievement for ninth grade earth science students. The study adopted the experimental approach. The sample consisted of (56) male and female ninth grade students. The experimental group studied using visual thinking networking and the control group studied through writing strategy. The researcher used two tools, a pre-post achievement test and problem solving achievement and aptitude test. The results of the study revealed that there is a relationship between the development of earth science learning and the use of visual thinking networks. Furthermore, Earth science learning was improved in the area of problem solving for the experimental group. Students who used the VTN strategies had a significantly higher mean score on the problem solving test items than students who used the writing strategy for learning science \((p = 0.005)\).

**Commentary:**

According to the above mentioned studies, it is clear that there are similarities and differences between this study and the previous studies. Regarding the aim, the previous studies agreed with this study in the fact that they all work for the development of visual thinking skills.

In light of the strategy or the independent variable, the current study agreed with the study of Qotob (2017), Hashem (2017), Badr (2017), Al-Otaibi (2016) and

Based on the methodology used in the current study which is quasi experimental approach, there are some studies that agreed with this study. For example, Qotob (2017), Hashem (2017), Badr (2017), Al Otaibi (2016) and Fayad (2015), Mansour (2015) and Abdullah, Zakaria and Halim (2012). However, it differed with the following studies: Ahmad (2016), Al Deeb (2015), Al Khuzaii (2012), El Kahlout (2012), Jabr (2010), Moshtaha (2010), Mahdi (2006) and Longo et. al. (2002).

When it comes to the tools, this study agreed with all the previous studies in designing a pre-post test for the visual thinking skills.


For the location or country, the recent study agreed with Ahmad (2016), Fayad (2015), Mansour (2015), Al Deeb (2015), El Kahlout (2012), Jabr (2010), Moshtaha (2010) and Mahdi (2006). They were all conducted in Gaza, Palestine. However, Hashem (2017) and Qotob (2017) were conducted in Egypt, Badr (2017) and Al Otaibi (2016) were conducted in Saudi Arabia, Abdullah, Zakaria and Halim (2012) was conducted in Malaysia and Longo et. al (2009) was conducted in America.

4. Benefits gained from the previous studies:
The researcher found that the previous studies were of great use because they were conducted by different researchers around the globe, on different subjects and ages. This confirms the importance of the topic of this study as it has been investigated in different contexts. The researcher considered the previous studies as a guide because they helped her decide the procedures of the study. Results of many studies revealed the effectiveness of mind mapping strategy which motivated the researcher to apply it on third graders. Moreover, the previous studies were helpful in designing and constructing the appropriate tools for the study such as the vocabulary and visual thinking tests. Furthermore, they helped the researcher write the theoretical framework outlines and decide on the statistical treatments of the results. They also helped the researcher interpret the results and the findings of her study.

Summary:
The first section of this chapter focused on the theoretical framework which was divided into three domains. The first domain tackled mind mapping, the second tackled vocabulary and the third discussed visual thinking. The second section discussed some previous studies that other researchers have conducted regarding mind mapping, vocabulary and visual thinking. Details about the aim, sample, design, tools and results are given as well as recommendations. The researcher also presented her comments. The section also showed how the researcher benefited from the studies.
Chapter 3
Methodology
Chapter 3: Methodology

Introduction:

This chapter introduces the procedures and steps the researcher followed to achieve the objectives of the study. The chapter includes items such as: approach of the study, population and sample of the study, variables and tools of the study, their validity and reliability and the statistical methods used to analyze the data.

1. Approach of the study:

The study adopted the quasi experimental approach which suits the nature of the research; finding the effect of the independent variable (mind mapping) on the dependent variables (vocabulary and visual thinking). Melhem (2000, p.217) defined the quasi experimental approach as, “it is a method in which the variables that affect a phenomenon are controlled except for one variable the researcher manipulates and changes to measure its effect on the phenomenon.”

Two groups were randomly chosen for the purpose of this study; the experimental group that studied using the mind mapping technique and the control group which was taught conventionally or traditionally.

Table (3.1): Study design

<table>
<thead>
<tr>
<th>Random sampling</th>
<th>Pre-tests</th>
<th>Post-tests</th>
<th>Data analysis and discussion of results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group taught using mind mapping</td>
<td>Pre-tests</td>
<td>Post-tests</td>
<td>Control group traditionally taught</td>
</tr>
<tr>
<td>Control group</td>
<td>Control group traditionally taught</td>
<td>Data analysis and discussion of results</td>
<td></td>
</tr>
</tbody>
</table>
2. Population of the study:

The population of the study consisted of the third graders enrolled in the first semester of 2017/2018 at UNRWA schools.

3. Sample of the study:

A sample of (79) male students was purposively chosen from the third graders at Al-Amal Elementary Boys School in Western Khan Yunis where the researcher is currently working. The sample of the study was randomly chosen from the third graders at the school. It was divided into two groups: the experimental group consisted of (39) students who studied using the mind mapping strategy and the control group (40) students who were traditionally taught. Table (3.2) shows the distribution of the sample of the study.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Grade</th>
<th>Groups</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>3</td>
<td>Experimental</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>79</td>
</tr>
</tbody>
</table>

4. Variables of the study:

The variables of the study are twofold

1. The independent variable: the mind mapping strategy and the traditional method.

2. The dependent variables: vocabulary and visual thinking.

5. Tools of the study:

To achieve the objectives of the study, the researcher used the following tools:

1. The vocabulary test:

A vocabulary pre- posttest was prepared by the researcher to measure the students’ achievement in vocabulary. The pre-test was applied before the intervention and the posttest was applied after.
a. **Aims of the test:**

The test is used to investigate the effectiveness of the mind mapping on 3rd graders’ vocabulary learning.

b. **Sources of designing the vocabulary test:**

The researcher designed the vocabulary test by mostly depending on the “English for Palestine 3A” book. She also depended on her experience as a teacher. Furthermore, the researcher reviewed literature and previous studies. In addition to that, she took the opinion of some teachers and educational specialists.

c. **Description of the test:**

The vocabulary test was divided into two parts. Part one consisted of information and some instructions, these are:

1. Information related to the description of the test and the number of questions.
2. Instructions on how to answer the test questions.

The researcher read the instructions and explained to the students how to answer the test. She also confirmed to the students that the test will not affect their school grades.

Part two consisted of the questions related to vocabulary, these are:

1. Complete the missing letter.
2. Complete the following dialogue from the list below.
3. Re-arrange the words to form correct sentences.
4. Match the pictures with the words.
5. Write new words from the following.
7. Re-arrange the following events.
8. Re-arrange the letters.

d. **Table of specifications:**

The researcher designed a table of specifications for the vocabulary tests based on the following criteria:

1. The objectives of units 7 and 8.
2. The vocabulary included in each unit.
3. Bloom’s taxonomy levels.
Table (3.3) shows the distribution of test questions based on the level of objectives.

**Table (3.3): distribution of test questions based on the level of objectives.**

<table>
<thead>
<tr>
<th>Level of objectives</th>
<th>No. of questions and title</th>
<th>Mark</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remembering</td>
<td>1. Complete the missing letter.</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4. Match</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>7. Re-arrange the following events</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Application</td>
<td>1. Complete the following dialogue</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>6. Classify</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Synthesis</td>
<td>3. Re-arrange the words to form correct sentences.</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5. Write new words from the following.</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>8. Re-arrange the letters.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td><strong>8</strong></td>
<td><strong>30</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The researcher designed the test depending on the table of specifications. It was divided into four levels based on Bloom’s taxonomy: remembering, comprehension, application, and synthesis.
e. **Validity of the vocabulary test:**

Validity means that the test should measure what it was intended to measure. To make sure the test was valid, the researcher conducted the following statistics:

1. Referee validity.
2. Pilot Study.
3. Internal consistency.

1. **Referee validity:**

The test was given to a group of English teachers, experts in English language and methodology and to educational specialists to make sure that the test is valid. The items of the test were modified according to the their opinions and recommendations. The test was approved by the referee committee. See the final version of the test in appendix (3).

2. **Pilot Study:**

The researcher conducted a pilot study that consisted of (38) male students enrolled in the fourth grade in the school year 2017/2018. The sample was randomly chosen to ensure the validity and reliability of the tests. It aimed at:

1. Estimating the time needed to conduct the tests.
2. Investigating the clarity and suitability of the test items.
3. Confirming and assessing the validity and reliability.

**Time Estimation:**

The time of the test was calculated based on the following equation:

\[ \text{Time estimation} = \frac{\text{time spent by the first 5 students} + \text{time spent by the last 5 students}}{10} \]

\[ 175 + 225 / 10 = 40 \text{ minutes.} \]

3. **Internal consistency validity:**

The researcher used Pearson correlation coefficient to calculate the internal consistency. Table (3.4) shows Pearson Correlation coefficient of each item and the whole test.
Table (3.4): Pearson Correlation coefficient of each item and the whole test.

<table>
<thead>
<tr>
<th>No. of questions</th>
<th>Pearson Correlation</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>.697**</td>
<td>0.01</td>
</tr>
<tr>
<td>2.</td>
<td>.801**</td>
<td>0.01</td>
</tr>
<tr>
<td>3.</td>
<td>.341*</td>
<td>0.05</td>
</tr>
<tr>
<td>4.</td>
<td>.759**</td>
<td>0.01</td>
</tr>
<tr>
<td>5.</td>
<td>.785**</td>
<td>0.01</td>
</tr>
<tr>
<td>6.</td>
<td>.727**</td>
<td>0.01</td>
</tr>
<tr>
<td>7.</td>
<td>.535**</td>
<td>0.01</td>
</tr>
<tr>
<td>8.</td>
<td>743**</td>
<td>0.01</td>
</tr>
</tbody>
</table>

* r table value df (37) and sig(0.05) = 0.304
** r table value df (37) and sig(0.01) = 0.393

Table (3.4) shows that the correlation coefficient of each item within its level is significant at level (0.01) except for item number three which is significant at (0.05). It can be concluded that the test was highly consistent and valid as a tool for this study.

Table (3.5): Pearson Correlation coefficient of every domain and the whole test

<table>
<thead>
<tr>
<th>Domain</th>
<th>Pearson Correlation</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remembering</td>
<td>.818**</td>
<td>0.01</td>
</tr>
<tr>
<td>Comprehension</td>
<td>.535**</td>
<td>0.01</td>
</tr>
<tr>
<td>Application</td>
<td>.871**</td>
<td>0.01</td>
</tr>
<tr>
<td>Synthesis</td>
<td>.792**</td>
<td>0.01</td>
</tr>
</tbody>
</table>

* r table value df (37) and sig (0.05) = 0.304
** r table value df (37) and sig (0.01) = 0.393
Table (3.5) shows that all the domains of the test have statistically significant correlations with the total test, which indicates a high internal consistency that reinforces the validity.

f. Difficulty coefficient:
Difficulty coefficient means the percentage of the students who gave wrong answers to the total number of the students who answered the test.

\[ Co. \text{ of difficulty} = \frac{\text{Number of students who gave wrong answers}}{\text{Total number of students}} \]

g. Discrimination coefficient:
It means that the test is able to differentiate between the high and the low achievers. The discrimination coefficient was calculated according to the following equation:

\[ Co. \text{ of discrimination} = \frac{\text{No. of correct answers in higher group} - \text{No. of correct answers in lower group}}{\text{Half of the no. of students in both groups}} \]

Table (3.6) shows the difficulty and discrimination coefficients for each item in the vocabulary test.

**Table (3.6): the difficulty and discrimination coefficients for each item in the vocabulary test.**

<table>
<thead>
<tr>
<th>No. of questions</th>
<th>Difficulty Coefficient</th>
<th>Discrimination coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.52</td>
<td>0.41</td>
</tr>
<tr>
<td>2.</td>
<td>0.36</td>
<td>0.36</td>
</tr>
<tr>
<td>3.</td>
<td>0.42</td>
<td>0.31</td>
</tr>
<tr>
<td>4.</td>
<td>0.39</td>
<td>0.52</td>
</tr>
<tr>
<td>5.</td>
<td>0.56</td>
<td>0.36</td>
</tr>
<tr>
<td>6.</td>
<td>0.43</td>
<td>0.31</td>
</tr>
<tr>
<td>No. of questions</td>
<td>Difficulty Coefficient</td>
<td>Discrimination coefficient</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>7.</td>
<td>0.52</td>
<td>0.26</td>
</tr>
<tr>
<td>8.</td>
<td>0.62</td>
<td>0.32</td>
</tr>
</tbody>
</table>

The results show that the difficulty coefficient ranges from (0.36) to (0.62) and the average of all difficulty coefficients is (0.47). The discrimination coefficient ranges from (0.26) to (0.52) and the average of all discrimination coefficients is (0.35). This means that the test was suitable and acceptable, hence the researcher will keep the test items without change or deletion.

**h. Reliability of the vocabulary test:**

Reliability means that a test should give the same results if it is administered twice to the same group of students. The researcher used the following ways to confirm the reliability of the test:

1. **Split half method:**

   This method depends on finding the Pearson correlation coefficient between the odd and even items in the vocabulary test and correcting the correlation coefficient using the Spearman brown formula:

   \[
   \frac{2R}{1 + R}
   \]

   The correlation coefficient between the odd and even questions equals (0.89). The Spearman-Brown Coefficient equals (0.94). The value of this correlation coefficient indicates good reliability of the test.

2. **Kuder Richardson 21:**

   To be more assured of the reliability of the test, the researcher used Kuder Richardson 21. The reliability coefficient for the whole test was calculated depending on the following formula:
KR-21:

\[ r = \frac{n}{n-1} \left[ 1 - \frac{\sum \rho q}{\sigma^2_x} \right] \]

\( n \) = number of items in the test

\( \rho = \frac{\text{number of persons answering the items correctly}}{\text{number of persons taking the test}} \)

\( q = \frac{\text{number of persons answering the items wrongly}}{\text{number of persons taking the test}} \)

\( \Sigma = \text{Summation sign indicating the } \rho q \text{ is summated over all items.} \)

\( \sigma^2_x \) = variance of the test.

\( r \) = Reliability of the test.

Kuder Richardson 21 coefficient for the total degree of the whole test is (0.86). This indicates that the test is highly reliable and the results of which can be depended on.

3. The visual thinking skills test:

The researcher designed a pre-post visual thinking skills test to measure the improvement of the third graders visual thinking skills. See appendix (4).

a. Preparing a visual thinking skills list:

The visual thinking skills list was prepared based on previous studies and related literature such as Mahdi (2006), El Kahlout (2012) and Jabr (2010). Table (3.7) clarifies the list of visual thinking skills.
Table (3.7): the visual thinking skills list

<table>
<thead>
<tr>
<th>No.</th>
<th>Visual thinking skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Visual reading</td>
</tr>
<tr>
<td>2</td>
<td>Visual differentiation</td>
</tr>
<tr>
<td>3</td>
<td>Realizing and connecting spatial relationships</td>
</tr>
<tr>
<td>4</td>
<td>Explaining information</td>
</tr>
<tr>
<td>5</td>
<td>Inferring meaning</td>
</tr>
</tbody>
</table>

b. **Aims of the test:**

The test aims at investigating the effectiveness of the mind mapping strategy on the 3rd graders’ visual thinking skills improvement.

c. **Sources of designing the visual thinking test:**

The researcher designed the visual thinking skills test by reviewing previous studies and related literature about visual thinking such as: Mahdi (2006), El Kahlout (2012), Jabr (2010) and Moshtaha (2010).

d. **Description of the test:**

The visual thinking skills test consisted of (22) items of multiple choice. It is an objective test. Objective tests are known for being flexible and do not fall under the subjectivity of the scorer. The following criteria were taken into consideration when designing the test:

1. The skills were distributed to all the test items.
2. The place of the correct answer changes in every item.
3. The items and the pictures in the test are clear.
4. The test items were suitable to the students’ level and age.

e. **Table of specifications:**

The researcher designed the table of specifications for the visual thinking skills based on the following criteria:

1. The objectives of unit 7 and 8 and their percentages.
2. Visual thinking skills included in both units.
3. Bloom’s taxonomy levels.

Table (3.8) shows the Distribution of visual thinking skills test questions based on the percentage and the skills.

**Table (3.8): the distribution of visual thinking skills test questions based on the percentage and the skills**

<table>
<thead>
<tr>
<th>Visual thinking skills</th>
<th>Items</th>
<th>Total no. of items</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual reading</td>
<td>1,2,3,12,17,19</td>
<td>6</td>
<td>27.27%</td>
</tr>
<tr>
<td>Visual differentiation</td>
<td>4,5,14,20</td>
<td>4</td>
<td>18.18%</td>
</tr>
<tr>
<td>Realizing and connecting spatial relationships</td>
<td>9,11,16,18,21,22</td>
<td>6</td>
<td>27.27%</td>
</tr>
<tr>
<td>Explaining information</td>
<td>6,7</td>
<td>2</td>
<td>9.1%</td>
</tr>
<tr>
<td>Inferring meaning</td>
<td>8,10,13,15</td>
<td>4</td>
<td>18.18%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>22</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**f. Validity of the visual thinking skills test:**

1. **Referee validity:**

   The test was given to a group of English teachers, experts in English language and methodology and to educational specialists to make sure the test is valid. The items of the test were modified according to their opinions and recommendations. The test was approved by the referee committee.

2. **Pilot study:**

   The researcher conducted a pilot study that consisted of (38) male students enrolled in the fourth grade in the school year 2017/2018. The sample was randomly chosen to ensure the validity and reliability of the tests. It aimed at:

   1. Estimating the time needed to conduct the tests.
   2. Investigating the clarity and suitability of the test items.
   3. Confirming and assessing the validity and reliability.
Time Estimation:

The time of the test was calculated based on the following equation:

\[
\text{Time estimation} = \frac{(\text{time spent by the first 5 students} + \text{time spent by the last 5 students})}{10}
\]

\[
175 + 225 \div 10 = 40 \text{ minutes.}
\]

3. Internal consistency validity:

The researcher used Pearson correlation coefficient to calculate the internal consistency. Table (3.9) shows Pearson Correlation coefficient of each item and the whole test.

<table>
<thead>
<tr>
<th>No.</th>
<th>Pearson Correlation</th>
<th>Sig</th>
<th>No.</th>
<th>Pearson Correlation</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>.902**</td>
<td>0.01</td>
<td>12.</td>
<td>.836**</td>
<td>0.01</td>
</tr>
<tr>
<td>2.</td>
<td>.839**</td>
<td>0.01</td>
<td>13.</td>
<td>.828**</td>
<td>0.01</td>
</tr>
<tr>
<td>3.</td>
<td>.792**</td>
<td>0.01</td>
<td>14.</td>
<td>.776**</td>
<td>0.01</td>
</tr>
<tr>
<td>4.</td>
<td>.894**</td>
<td>0.01</td>
<td>15.</td>
<td>.360*</td>
<td>0.27</td>
</tr>
<tr>
<td>5.</td>
<td>.510**</td>
<td>0.01</td>
<td>16.</td>
<td>.816**</td>
<td>0.01</td>
</tr>
<tr>
<td>6.</td>
<td>.744**</td>
<td>0.01</td>
<td>17.</td>
<td>.413**</td>
<td>0.10</td>
</tr>
<tr>
<td>7.</td>
<td>.888**</td>
<td>0.01</td>
<td>18.</td>
<td>.784**</td>
<td>0.01</td>
</tr>
<tr>
<td>8.</td>
<td>.416**</td>
<td>0.09</td>
<td>19.</td>
<td>.403**</td>
<td>0.12</td>
</tr>
<tr>
<td>9.</td>
<td>.833**</td>
<td>0.01</td>
<td>20.</td>
<td>.488**</td>
<td>0.02</td>
</tr>
<tr>
<td>10.</td>
<td>.328*</td>
<td>0.44</td>
<td>21.</td>
<td>.795**</td>
<td>0.01</td>
</tr>
<tr>
<td>11.</td>
<td>.861**</td>
<td>0.01</td>
<td>22.</td>
<td>.465**</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*r table value df (37) and sig (0.05) = 0.304

**r table value df (37) and sig (0.01) = 0.393
Table (3.9) shows that all test items are significant at (0.01) except for items 10 and 15, which indicates the test validity. The researcher also calculated the correlation coefficient of every domain and the whole test.

**Table (3.10): Pearson Correlation coefficient of every domain and the whole test**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Pearson Correlation</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual reading</td>
<td>.978**</td>
<td>0.01</td>
</tr>
<tr>
<td>Visual differentiation</td>
<td>.932**</td>
<td>0.01</td>
</tr>
<tr>
<td>Realizing and connecting spatial relationships</td>
<td>.961**</td>
<td>0.01</td>
</tr>
<tr>
<td>Explaining formation</td>
<td>.861**</td>
<td>0.01</td>
</tr>
<tr>
<td>Inferring meaning</td>
<td>.683**</td>
<td>0.01</td>
</tr>
</tbody>
</table>

* *r table value df(37) and sig(0.05) = 0.304
** *r table value df(37) and sig(0.01) = 0.393

Table (3.10) shows the correlation of each domain and the whole test. It can be concluded that the test is highly consistent and valid as a tool for the study.

4. **Difficulty coefficient:**

Difficulty coefficient means the percentage of the students who gave wrong answers to the total number of the students who answered the test.

\[
Co. \text{ of difficulty} = \frac{\text{Number of students who gave wrong answers}}{\text{Total number of students}}
\]
5. **Discrimination coefficient:**

It means that the test is able to differentiate between the high and the low achievers.

The discrimination coefficient was calculated according to the following equation:

\[ \text{Co. of discrimination} = \frac{\text{No. of correct answers in higher group} - \text{No. of correct answers in lower group}}{\text{No. of students in one group}} \]

Table (3.11) shows the difficulty and discrimination coefficients for each item in the visual thinking skills test.

**Table (3.11): the difficulty and discrimination coefficients for each item in the visual thinking skills test.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Difficulty Coefficient</th>
<th>No.</th>
<th>Discrimination coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.28</td>
<td>1.</td>
<td>0.42</td>
</tr>
<tr>
<td>2.</td>
<td>0.31</td>
<td>2.</td>
<td>0.35</td>
</tr>
<tr>
<td>3.</td>
<td>0.34</td>
<td>3.</td>
<td>0.31</td>
</tr>
<tr>
<td>4.</td>
<td>0.32</td>
<td>4.</td>
<td>0.26</td>
</tr>
<tr>
<td>5.</td>
<td>0.30</td>
<td>5.</td>
<td>0.43</td>
</tr>
<tr>
<td>6.</td>
<td>0.36</td>
<td>6.</td>
<td>0.36</td>
</tr>
<tr>
<td>7.</td>
<td>0.26</td>
<td>7.</td>
<td>0.31</td>
</tr>
<tr>
<td>8.</td>
<td>0.42</td>
<td>8.</td>
<td>0.34</td>
</tr>
<tr>
<td>9.</td>
<td>0.29</td>
<td>9.</td>
<td>0.33</td>
</tr>
<tr>
<td>10.</td>
<td>0.31</td>
<td>10.</td>
<td>0.31</td>
</tr>
<tr>
<td>11.</td>
<td>0.28</td>
<td>11.</td>
<td>0.26</td>
</tr>
<tr>
<td>12.</td>
<td>0.31</td>
<td>12.</td>
<td>0.27</td>
</tr>
<tr>
<td>No.</td>
<td>Difficulty Coefficient</td>
<td>No.</td>
<td>Discrimination Coefficient</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------</td>
<td>-----</td>
<td>----------------------------</td>
</tr>
<tr>
<td>13.</td>
<td>0.34</td>
<td>13.</td>
<td>0.41</td>
</tr>
<tr>
<td>14.</td>
<td>0.37</td>
<td>14.</td>
<td>0.29</td>
</tr>
<tr>
<td>15.</td>
<td>0.26</td>
<td>15.</td>
<td>0.42</td>
</tr>
<tr>
<td>16.</td>
<td>0.34</td>
<td>16.</td>
<td>0.31</td>
</tr>
<tr>
<td>17.</td>
<td>0.28</td>
<td>17.</td>
<td>0.47</td>
</tr>
<tr>
<td>18.</td>
<td>0.36</td>
<td>18.</td>
<td>0.26</td>
</tr>
<tr>
<td>19.</td>
<td>0.24</td>
<td>19.</td>
<td>0.40</td>
</tr>
<tr>
<td>20.</td>
<td>0.23</td>
<td>20.</td>
<td>0.36</td>
</tr>
<tr>
<td>21.</td>
<td>0.39</td>
<td>21.</td>
<td>0.31</td>
</tr>
<tr>
<td>22.</td>
<td>0.26</td>
<td>22.</td>
<td>0.36</td>
</tr>
</tbody>
</table>

The results show that the difficulty coefficient ranges from (0.23) to (0.42) and the average of all difficulty coefficients is (0.31). The discrimination coefficient ranges from (0.26) to (0.47) and the average of all discrimination coefficients is (0.34). That is to say that the test was suitable and acceptable, hence it is valid.

6. **Reliability of the visual thinking skills test:**

The researcher used split half method and Kuder Richardson (20) to measure the reliability of the test.
a. **Split half method:**

This method depends on finding the Pearson correlation coefficient between the odd and even items in the vocabulary test and correcting the correlation coefficient using the Spearman brown formula:

\[
\frac{2R}{1 + R}
\]

The correlation coefficient of the total degree was (0.831) and the correction coefficient was (0.908) which indicates the reliability of the test.

b. **Kuder Richardson 20**

The researcher calculated the reliability using the Kuder Richardson 20 formula:

\[
K - R20 = \frac{n}{n - 1} \left[ 1 - \frac{\sum \rho \sigma}{S^2} \right]
\]

\(n\): number of test items.

\(\rho\): percentage of correct answers.

\(\sigma\): percentage of wrong answers for each item.

\(S^2\): variance.

<table>
<thead>
<tr>
<th>K-R20</th>
<th>(S^2)</th>
<th>(\sum \rho \sigma)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.91</td>
<td>97.7</td>
<td>12</td>
<td>22</td>
</tr>
</tbody>
</table>

As shown in table (3.12), the reliability coefficient by K-R20 is (0.91). This means that the test is reliable.

6. **Controlling the variables:**

To make sure that the results are accurate, the researcher tried to control some variables. The control and experimental groups were taught by the same teacher. Both groups received six-week instruction. The experimental group was taught by using mind mapping and the control group was taught traditionally. In addition to the forementioned variables, the researcher also tried to control the following variables:
1. English Language general achievement variable:

Table (3.13): t-test for the differences between the control and experimental groups due to the English Language general achievement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>No.</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>t value</th>
<th>Sig</th>
<th>Sig. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Language general achievement</td>
<td>Experimental</td>
<td>39</td>
<td>43</td>
<td>6.4</td>
<td>0.5</td>
<td>0.8</td>
<td>Not sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>42</td>
<td>6.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The researcher used t test to analyze the results of the second term final exam for the year 2016/2017. As shown in table (3.13), sig equals (0.8). This means we accept the hypothesis that states that there are no statistical differences in the English Language general achievement between the experimental and control groups.

2. Vocabulary test:

To make sure that both groups are the same in their vocabulary knowledge, the researcher examined both groups’ performance on the pre-vocabulary test. Table (3.14) shows t-test results for the differences between the control and experimental groups in the area of vocabulary knowledge.

Table (3.14): t-test for the differences between the control and experimental groups in vocabulary knowledge.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>No.</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>t value</th>
<th>Sig</th>
<th>Sig. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>Experimental</td>
<td>39</td>
<td>7.3</td>
<td>3.7</td>
<td>0.06</td>
<td>0.21</td>
<td>Not sig.</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>6.3</td>
<td>2.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It can be noticed from the table that sig equals (0.21), so we accept the hypothesis that indicates no statistical differences between the control and experimental groups due to the vocabulary variable.
3. Visual thinking skills:

Table (3.15) shows t-test results for the differences between the control and experimental groups in the area of visual thinking.

Table (3.15): t-test for the differences between the control and experimental groups due to visual thinking.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>No.</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>t value</th>
<th>Sig</th>
<th>Sig. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual thinking</td>
<td>Experimental</td>
<td>39</td>
<td>9.1</td>
<td>3</td>
<td>0.07</td>
<td>0.16</td>
<td>Not sig.</td>
</tr>
<tr>
<td>skills</td>
<td>Control</td>
<td>40</td>
<td>9.2</td>
<td>2.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sig equals (0.16), hence we accept the hypothesis that indicates there are no statistical differences between the control and experimental groups due to the visual thinking skills variable.

7. Study procedures:

The study progressed based on the following steps:

1. The researcher reviewed some literature and previous studies related to mind mapping, vocabulary and visual thinking skills.
2. She chose the population and sample of the study.
3. She identified the units suitable for mind mapping.
4. She designed pre-post vocabulary and visual thinking tests.
5. She gave the tests to educational specialists, experts in English language and methodology and English teachers to make sure the tests were valid and suitable.
6. She applied the tests on a pilot sample and the results of which were analyzed.
7. She applied the pre-tests on both groups.
8. She taught the experimental group with mind mapping and the control group was traditionally taught.
9. She applied the post-tests on both groups.
10. The results of the tests were recorded and statistically analyzed.
11. The researcher gave some recommendations and suggestions based on the results of the study.
8. Statistical analysis:

The following statistical methods were employed:

1. T-test for two independent samples.
2. Eta square to calculate the effect size.

Summary:

This chapter showed the methodology, procedures of designing and applying the tools, the sample of the study and the statistical methods the researcher used in analyzing both the vocabulary and the visual thinking tests. The following chapter deals with the results of the study.
Chapter 4
Results of the Study
Chapter 4: Results of the Study

Introduction:

After introducing the methodology of the study which aimed at investigating the effectiveness of using mind mapping on the 3rd graders’ vocabulary learning and improving their visual thinking at UNRWA schools, it is due now to refer to the results and findings of this research. This is done through answering the questions introduced in chapter one.

1. Answer of the first question:

First question: How is the mind mapping strategy applied?

After reviewing previous studies about mind mapping and how it is used in teaching various subjects, the researcher formed an idea about how she is going to use mind mapping to teach vocabulary and improve visual thinking. The researcher used mind maps in presenting vocabulary by drawing a mind map with the topic in the middle and presenting each word with its picture. She also used it as a brainstorming technique to elicit words. Furthermore, she used mind maps in designing activities such as complete the missing letter and fill in the blanks either on board, on posters or in worksheets in groups or individually. In addition, she used it as a revision and a summary. The researcher designed lesson plans based on the lessons from English for Palestine 3A, which she taught using the mind mapping strategy. See appendix (5) for lesson plans and appendix (6) for pictures.

2. Answer of the second question:

Second question: What are the vocabulary intended to be taught to both experimental and control groups?

The vocabulary the researcher taught using the mind mapping strategy are in English for Palestine 3A, specifically vocabulary in units 7 and 8.

Unit 7 “My Day” tackles mainly daily routines and activities, the times of the day (morning, afternoon, evening, night), and the activities done in each time. Unit 8 “It’s Sunny” is mainly about the weather, weather conditions, places and describing the weather at certain places (beach, park, swimming pool, …) and finally prepositions.
3. Answer of the third question.

Third question: What are the visual thinking skills intended to be improved?

As the researcher mentioned earlier that after reviewing and reading literature related to visual thinking like Mahdi (2006), El Kahlout (2012), Jabr (2010), Al Deeb (2015), Abed Al Saheb and Affon (2012) and Ammar and Al Qabani (2011), she chose the skills suitable for the third graders. Table (4.1) shows the visual thinking skills.

Table (4.1): visual thinking skills.

<table>
<thead>
<tr>
<th>No.</th>
<th>Visual thinking skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Visual reading</td>
</tr>
<tr>
<td>2</td>
<td>Visual differentiation</td>
</tr>
<tr>
<td>3</td>
<td>Realizing and connecting spatial relationships</td>
</tr>
<tr>
<td>4</td>
<td>Explaining information</td>
</tr>
<tr>
<td>5</td>
<td>Inferring meaning</td>
</tr>
</tbody>
</table>

4. Answer of the fourth question:

Fourth question: Are there statistically significant differences at ( $\alpha \leq 0.05$) in the mean scores of the experimental and control groups in the vocabulary post test?

To answer the fourth question, the researcher tested the first null hypothesis using t-test. The first hypothesis is: there are no statistically significant differences at ( $\alpha \leq 0.05$) in the mean scores of the experimental and control groups in the vocabulary post test. The following table (4.2) shows the results of the differences in the vocabulary post-test.
Table (4.2): t-test results of the differences between the experimental and control groups in the vocabulary post-test.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>t</th>
<th>Sig</th>
<th>Sig. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remembering</td>
<td>Control</td>
<td>40</td>
<td>4.2</td>
<td>1.3</td>
<td>-2.61</td>
<td>0.05</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>6</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>3.7</td>
<td>0.87</td>
<td>-2.73</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>5</td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>4.1</td>
<td>1.23</td>
<td>-2.85</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>5</td>
<td>1.41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>4</td>
<td>1.52</td>
<td>-2.7</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>6</td>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>40</td>
<td>16</td>
<td>2.5</td>
<td>-2.9</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>22</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$t$ table at df (77) sig. level at (0.05) = 1.99

$t$ table at df (77) sig. level at (0.01) = 2.639

Table (4.2) indicates that the mean score at the remembering level of the experimental group is (6) while the mean score of the control group is (4.2). (t) calculated value is (-2.61) it is significant at (0.05). This means there are statistically significant differences between the mean scores of the experimental and control groups in the remembering level in favor of the experimental group.

Moreover, the mean score at the comprehension level of the experimental group is (5) which is larger than the mean score of the control group (3.7). (t) calculated value is (-2.73) which is significant at (0.01). That is to say, there are statistically significant differences between the mean scores of the experimental and control groups in the comprehension level in favor of the experimental group.

The table also shows that the mean score at the application level of the experimental group is (5) which is larger than the mean score of the control group (4.1). (t) calculated value is (-2.85) which is also larger than (t) table (2.639) and it is significant at (0.01). In other words, there are statistically significant differences between the mean scores of the experimental and control groups in the application level in favor of the experimental group.
In addition, the table indicates that the mean score at the synthesis level of the experimental group is (6) which is larger than the mean score of the control group (4). (t) calculated value is (-2.7) which is larger than (t) table (2.639), thus it is significant at (0.01). This means there are statistically significant differences between the mean scores of the experimental and control groups in the synthesis level in favor of the experimental group. The table also shows that the highest means in the vocabulary test for the experimental group were in the remembering and synthesis level (6) and the control group in the remembering level (4.2). The lowest means for the experimental group were in comprehension and application levels (5) and the control group in the comprehension level (3.7).

Overall, table (4.2) indicates that the mean score of the experimental group in the whole test is (22) which is larger than the mean score of the control group (16). This means that there are differences between the experimental and control groups in favor of the experimental group. What also proves this is the (t) calculated value. The table indicates that (t) calculated value (-2.9) is larger than (t) table value (2.639) in the post-test. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, this means that there are statistically significant differences at (α =0.01) between the mean scores of the experimental and control groups in the vocabulary post-test in favor of the experimental group. Thus, the mind mapping strategy had a good effect on vocabulary learning of the experimental group. To make sure that the differences were not by chance but as a result of the effect of the strategy, the researcher used Eta square ($\eta^2$) to calculate the effect size based on the following formula: (Afana, 2000, p.42)

$$\eta^2 = \frac{t^2}{t^2 + df}$$

The researcher also calculated effect size depending on the following formula:

$$d = \frac{2\sqrt{\eta^2}}{\sqrt{1-\eta^2}}$$
Table (4.3): the effect size levels based on Eta square $\eta^2$ and d

<table>
<thead>
<tr>
<th>Effect</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eta square $\eta^2$</td>
<td>0.01</td>
<td>0.06</td>
<td>0.14</td>
</tr>
<tr>
<td>d</td>
<td>0.2</td>
<td>0.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

(Afana, 2000, p.38)

Table (4.4): t value, eta square $\eta^2$ and d.

<table>
<thead>
<tr>
<th>Scope</th>
<th>t value</th>
<th>eta square $\eta^2$</th>
<th>d</th>
<th>Effect level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.9</td>
<td>0.098</td>
<td>0.69</td>
<td>medium</td>
</tr>
</tbody>
</table>

It is clear from table (4.4) that eta square $\eta^2$ value is (0.098). Hence, the effect level is medium and the t test results and the differences between both groups are due to the use of mind mapping.

5. Answer of the fifth question:

Fifth question: Are there statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental and control groups in the visual thinking post test?

To answer this question, the researcher tested the second hypothesis which is: there are no statistically significant differences at ($\alpha \leq 0.05$) in the mean scores of the experimental and control groups in the visual thinking post test.

To test the hypothesis, means, standard deviations and t value of both groups were calculated. Table (4.5) shows the results of the differences in the visual thinking posttest.
Table (4.5): t-test results of the differences between the experimental and control groups in the visual thinking posttest.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>t</th>
<th>Sig</th>
<th>Sig. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual reading</td>
<td>Control</td>
<td>40</td>
<td>3.2</td>
<td>1.3</td>
<td>2.7</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>5</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual differentiation</td>
<td>Control</td>
<td>40</td>
<td>2.3</td>
<td>1.6</td>
<td>2.6</td>
<td>0.05</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>3</td>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realizing and connecting</td>
<td>Control</td>
<td>40</td>
<td>3.7</td>
<td>1.24</td>
<td>2.65</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td>spatial relationships</td>
<td>Experimental</td>
<td>39</td>
<td>5</td>
<td>1.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explaining information</td>
<td>Control</td>
<td>40</td>
<td>1</td>
<td>1.6</td>
<td>2.7</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>2</td>
<td>1.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inferring meaning</td>
<td>Control</td>
<td>40</td>
<td>2.3</td>
<td>1.71</td>
<td>2.81</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>3</td>
<td>1.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Control</td>
<td>40</td>
<td>12.5</td>
<td>3.9</td>
<td>3.27</td>
<td>0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>39</td>
<td>18</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
t_{\text{table}} \text{ at } df(77) \text{ sig. level at (0.05)} = 1.99
\]
\[
t_{\text{table}} \text{ at } df(77) \text{ sig. level at (0.01)} = 2.639
\]

For the visual thinking skills, it is clear from table (4.5) that the mean score at the visual reading skill of the experimental group is (5) which is larger than the mean score of the control group (3.2). \( t \) calculated is (2.7) which is larger than \( t \) table (2.639). This means there are statistically significant differences in the mean scores of the experimental and control groups in the visual reading skill in favor of the experimental group.

Regarding the visual differentiation level, the mean scores of the experimental group is (3) which is larger than the mean score of the control group (2.3). \( t \) calculated is (2.6) and is significant at (0.05). That is to say, there are statistically significant differences in the mean scores of the experimental and control groups in the visual differentiation skill in favor of the experimental group.

Moreover, the table indicates that the mean scores at the realizing and connecting spatial relationships skill of the experimental group is (5) which is larger than the mean score of the control group (3.7). \( t \) calculated is (2.65) which is larger
than (t) table (2.639). In other words, there are statistically significant differences in the mean scores of the experimental and control groups in the realizing and connecting spatial relationships skill in favor of the experimental group.

In addition to that, the mean scores at the explaining information skill of the experimental group is (2) while the mean score of the control group (1). (t) calculated is (2.7) which is larger than (t) table (2.639). In other words, there are statistically significant differences in the mean scores of the experimental and control groups in the explaining information skill in favor of the experimental group.

At the inferring information skill, the mean scores of the experimental group is (3) while the mean score of the control group (2.3). (t) calculated is (2.81) which is larger than (t) table (2.639) and is significant at (0.01). This means there are statistically significant differences in the mean scores of the experimental and control groups in the inferring information skill in favor of the experimental group. The table also shows that the highest mean scores were in the visual reading and realizing and connecting spatial relationships skills. The table also shows that the highest means in the visual thinking test for the experimental group were in the visual reading and realizing and connecting spatial relationships levels (5) and the lowest were in the explaining information level (2). The highest means for the control group were in realizing and connecting spatial relationships levels (3.7) and the lowest were in explaining information (1).

In general, it is clear from the table that the mean score of the experimental group in the whole test is (18) which is larger than the mean score of the control group (12.5). The table also indicates that (t) calculated (3.27) is larger than (t) table (2.639). Thus, we reject the null hypothesis and accept the alternative hypothesis. This indicates that there are statistically significant differences at (\( \alpha = 0.01 \)) in the mean scores of the experimental and control groups in the visual thinking post test in favor of the experimental group. This shows that the strategy had a good effect on improving the experimental group’s visual thinking skills.

The researcher calculated Eta square \( \eta^2 \) and effect size. Table (4.6) shows the values of (t), \( \eta^2 \) and d.
Table (4.6): t value, eta square $\eta^2$ and d.

<table>
<thead>
<tr>
<th>Scope</th>
<th>t value</th>
<th>$\eta^2$</th>
<th>d</th>
<th>Effect level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3.27</td>
<td>0.11</td>
<td>0.7</td>
<td>medium</td>
</tr>
</tbody>
</table>

The values in the table indicate that there is a medium effect of the mind mapping strategy on the improvement of the experimental group’s visual thinking skills.

Summary:

This chapter discussed the statistical analysis of the data collected throughout the study. After analyzing the data of the vocabulary test, it is obvious that there are statistically significant difference at ($\alpha = 0.01$) in the mean scores of the experimental and control groups in the vocabulary post-test in favor of the experimental group. Furthermore, the data analysis of the visual thinking test shows that there are statistically significant differences at ($\alpha = 0.01$) in the mean scores of the experimental and control groups in the visual thinking post-test in favor of the experimental group. The previous results confirmed the medium effect of the strategy on vocabulary learning and improving visual thinking skills. In the next chapter, the researcher will discuss and interpret the results before drawing some conclusions and putting forward some suggestions and recommendations.
Chapter 5

Discussion and Recommendations
Chapter 5: Discussion and Recommendations

Introduction:

This chapter discusses the results of the study and summarizes the conclusions obtained. Some recommendations which can be beneficial for curriculum designers and decision makers, supervisors, teachers and researchers have been put forward with the hope of helping in improving the teaching-learning process.

1. Discussion of the first question:

The first question was: How is the mind mapping strategy applied?

The researcher mentioned earlier that mind mapping is a strategy that depends on placing the central idea in the middle of the page and creating branches out of it. In addition to that, it also depends on using lines, pictures, symbols, drawings and images. The researcher used this strategy on Gazan third graders because the nature of this method is very close to the students’ age and thinking level. Thus, this will lead to the improvement of the students achievement in English. The researcher reviewed some previous studies and related literature such as Heidari and Karimi (2015), Sahrawi (2013), Bahadori and Gorjian (2016), Abdul Aziz and Yamat (2016), Al Jarf (2015), Buran and Filukov (2015), Abu Diak (2016), Kusuma (2015), Suseno and Setyawan (2013), Riswanto and Putra (2012), and Hawrani (2011), Hussein (2017), Sari and Pulungan(2015). She was able to form an idea about mind maps and use it to the best way possible with the third graders. The researcher used mind maps in presenting vocabulary by drawing a mind map with the topic in the middle and presenting each word with its picture. She also used it as a brainstorming technique to elicit words. Furthermore, she used mind maps in designing activities such as complete the missing letter and fill in the blanks. In addition, she used it as a revision and a summary. See appendix (5) for lesson plans and appendix (6) for pictures. The results of the experimental group were great in both tests which indicates the good effect of mind mapping on vocabulary and visual thinking.

2. Discussion of the second question:

The second question was: What are the vocabulary intended to be taught to both experimental and control groups?
As mentioned earlier in chapter 4, the vocabulary the researcher taught using the mind mapping strategy are in English for Palestine 3A, specifically vocabulary in units 7 and 8. Unit 7 “My Day” tackles mainly daily routines and activities such as get up, go to school, watch cartoons, play computer games, do homework and go to bed and time expressions such as in the morning, afternoon, evening and at night.

Unit 8 “It’s Sunny” is mainly about the weather and vocabulary related to weather like sunny, rainy, windy, cloudy, hot and cold, places like the zoo, park, beach, swimming pool, playground and river and finally some prepositions such as next to, on, in and at.

The researcher employed the mind mapping strategy in every aspect of each unit. She also used it in different stages in presenting the vocabulary of each unit. For example, she used it in brainstorming, revision, summary and in creating different vocabulary exercises. The results of this study showed that there is an improvement in the experimental group’s vocabulary learning this agreed with the studies of Abdul Aziz and Yamat (2016) and Bahadori and Gorjian (2016), Heidari and Karimi (2015), Sahrawi (2013).

3. Discussion of the third question:

Third question: What are the visual thinking skills intended to be improved?

The researcher was able to choose the suitable visual thinking skills for the third grade based on some studies about visual thinking such as Mahdi (2006), El Kahlout (2012), Jabr (2010), Al Deeb (2015), Abed Al Saheb and Affon (2012) and Ammar and Al Qabani (2011). These skills are visual reading, visual differentiation, realizing and connecting spatial relationships, explaining information and inferring meaning. The researcher believes that units 7 and 8 were rich in visual thinking skills which made it easier to employ the mind mapping strategy. The results of the study revealed the positive effect the mind mapping strategy had on these skills.

4. Discussion of the results of the first hypothesis related to the fourth question:

After testing the first hypothesis, the results revealed that there were statistically significant differences at ($\alpha = 0.01$) in the mean scores of the experimental and control groups in the vocabulary post-test in favor of the experimental group. The researcher
attributes this effect to the strategy and the way of using it. The fact that mind mapping can be used in different ways and in different stages of the lesson creates a huge difference. The variety of exercises that can use this strategy is wide. Furthermore, the fact that there are differences between the experimental and control groups is due to the nature of the strategy. The experimental group learned vocabulary through a method that focused on keeping the learning process enjoyable and colorful. Mind maps help students connect colors, symbols and pictures with words. This provokes both hemispheres of the brain to work, thus retention and the rate of keeping words in memory are high. This will eventually lead to improving the students’ achievement level.

Students are also attracted to new methods of learning that help them come out of the boredom of the traditional teaching/learning method. This would be easier with mind mapping because the nature of this strategy depends on simplicity, colors, images, symbols, pictures and drawing. Hence, the strategy would become close to the students’ age and thinking level. Consequently, the byproduct would be a motivated student who is ready to learn more.

The result of the first hypothesis agrees with the results of some previous studies such as: Heidari and Karimi (2015), Sahrawi (2013), Bahadori and Gorjian (2016), Abdul Aziz and Yamat (2016), Al Jarf (2015), Buran and Filukov (2015). All the mentioned studies revealed the good effect of mind mapping on vocabulary learning in different countries and in different situations, while this study confirmed the positive effect of the strategy on Gaza students.

5. Discussion of the results of the second hypothesis related to the fifth question:

After testing the second hypothesis, the results revealed that there were statistically significant differences at ($\alpha = 0.01$) in the mean scores of the experimental and control groups in the visual thinking post-test in favor of the experimental group.

This can be attributed to the fact that mind mapping and visual thinking are related. As a matter of fact, mind mapping is a tool of visual learning. Additionally, the interaction between mind maps and visual thinking makes the process of learning easier because both aspects share common things. They both depend on pictures,
colors, symbols and drawings. Mind mapping helps students arrange their ideas and thoughts visually thus contributing in the development of visual thinking skills.

The result of the second hypothesis agrees with the following previous studies Fayad (2015), Al-Otaibi (2016), Qotob (2017), Badr (2017) and Hashem (2017). These studies explored the effect of mind maps on developing visual thinking skills. They all agreed on the fact that it had a great impact on visual thinking.

6. Conclusion

Based on the findings drawn from the results of the study, the researcher can conclude the following:

a. The mind mapping strategy proved to be an effective method in teaching.
b. The mind mapping strategy has the ability of transforming the class into more cheerful and colorful environment.
c. The mind mapping strategy developed the spirit of cooperation and team work particularly when using group mind maps.
d. The mind mapping strategy increased and helped the students think better and in a more enjoyable way.
e. It can provide teachers with ideas to use it differently each time it is used.
f. It proved that it is a motivating and fun method.
g. It is suitable to all ages, levels and subjects other than English.
h. It opens up new horizons to teachers to upgrade their teaching methods and skills.
i. It proved that it is very effective for memorization and retention.

7. Recommendations

In light of the study results, the researcher suggests the following recommendations:

1. Curriculum designers and decision makers are recommended to:
   a. integrate the mind mapping strategy in curricula.
   b. design materials and hold workshops for supervisors about mind mapping.

2. Supervisors are recommended to:
   a. hold training courses about mind mapping.
   b. provide mind mapping materials and books for teachers.
c. organize workshops to introduce teachers to new methods of teaching including mind mapping.

3. **Teachers are recommended to:**
   a. use mind mapping in teaching various aspects in English. It is a resilient technique that it can encompass any aspect of English.
   b. change the traditional method of teaching to a more modern enjoyable one.

4. **Researchers are recommended to do the following studies:**
   a. The effect of mind mapping on learning grammar.
   b. The effect of mind mapping on developing speaking.
   c. The effect of mind mapping on developing writing.
   d. The effect of mind mapping on developing listening.
   e. The effect of mind mapping on developing reading or improving reading comprehension.

   To sum up, this chapter tackled the findings of the study. The conclusions were drawn in light of the study findings. The researcher suggested some recommendations which can be of great use to curriculum designers, decision makers, supervisors, teachers and researchers as they can help improve the teaching learning process.
References
References

1. English References


Demir, Y. (2013). The Role of In-class Vocabulary Strategies in Vocabulary Retention of Turkish EFL Learners. Elementary Education Online, 12(4), 1173-1187.


Sunan Ibn Majah. (n.d.). *The Chapters on Asceticism from Sunan Ibn Majah*. Retrieved August 10, 2017, from https://sunnah.com/search/?q=%D8%A7%D8%AA%D8%AF%D8%B1%D9%88%D9%86+%D9%85%D8%A7+%D9%87%D8%B0%D8%A7+%D9%82%D8%A7%D9%84%D9%88%D8%A7+%D8%A7%D9%84%D9%87+%D9%88+%D8%B1%D8%B3%D9%88%D9%84%D9%87+%D8%A7%D8%B9%D9%84%D9%85+%D9%82%D8%A7%D9%84+%D9%87%D8%B0%D8%A7+%D8%A7%D9%86+%D8%A7%D9%84%D8%AE%D8%B7+%D8%A7%D9%84%D8%A7%D9%88%D8%B3%D8%B7


2. Arabic References


العتيبي، وضحى (2016). فاعلية استراتيجية الخرائط الذهنية الإلكترونية غير الهرمية في تنمية مهارات التفكير البصري لدى طلاب المرحلة الابتدائية. مجلة العلوم التربوية والنفسية، 17(2).


عبد، وليم و عفانة، عزو (2003). التفكير والمنهاج المدرسي. ط1، مكتبة الفلاح للنشر والتوزيع.


Appendices
Appendix (1): Permission to apply the experiment

The Islamic University - Gaza

To: Abu Mutalat

Please your advice on possibility of this.

F.M.

22/11/17

الموضوع: تسهيل مهمة طالب ماجستير

تهديكم كلية التربية تحياتنا، يرجى التكرم بالعلم أن الطالبة/ حنين كمال عثمان شرف جامعيnummer مسجلة ضمن طلبة الماجستير في كلية التربية تخصص- مناهج وطرق تدريس، وتحت عنوان:

"فاعدة استخدام الخريطة الذهنية على تعلم مفردات اللغة الإنجليزية وتمثلية التفكير المصري لدى طلاب الصف الثالث في مدارس الأولى.

يرجى التعامل بشكلاً مماثلاً للمشتملة المذكورة أعلاه، والسماح لها بتلقيح اختباري دراستها على اللغة المستفادة من مادة الصف الثالث والرابع بدورتي، مصطفى حافظ (ب)، تترأ الأDSL الإدراة.

بالمتلقى النور...

عميد كلية التربية

أ.د. محمد أبو شفيق
## Appendix (2): Referee Committee

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Awad Keshta</td>
<td>PhD in Methodology – IUG</td>
</tr>
<tr>
<td>2</td>
<td>Kamal Mortaja</td>
<td>PhD in Methodology – IUG</td>
</tr>
<tr>
<td>3</td>
<td>Abed Rabbo Alia</td>
<td>PhD in Education/EFL – IUG</td>
</tr>
<tr>
<td>4</td>
<td>Mosheer Amer</td>
<td>PhD in Linguistics- IUG</td>
</tr>
<tr>
<td>5</td>
<td>Ahmad Al Abbasi</td>
<td>MA in Methodology</td>
</tr>
<tr>
<td>6</td>
<td>Adham Abu Hattab</td>
<td>MA in Methodology – Al Aqsa University</td>
</tr>
<tr>
<td>7</td>
<td>Kahled Abu O’da</td>
<td>MA in Methodology</td>
</tr>
<tr>
<td>8</td>
<td>Ahmad Badr</td>
<td>MA in Methodology</td>
</tr>
<tr>
<td>9</td>
<td>Ali Abdul Qader Zendah</td>
<td>MA in Methodology – Al Aqsa University</td>
</tr>
<tr>
<td>10</td>
<td>Rami Abu Hattab</td>
<td>MBA - English teacher – UNRWA</td>
</tr>
<tr>
<td>11</td>
<td>Mohammad Al Astal</td>
<td>Educational Specialist – UNRWA</td>
</tr>
<tr>
<td>12</td>
<td>Yasmin Abu Hattab</td>
<td>English teacher – UNRWA</td>
</tr>
<tr>
<td>13</td>
<td>Mohammad Mo’mar</td>
<td>English teacher – UNRWA</td>
</tr>
</tbody>
</table>
Appendix (3): The vocabulary test

The Islamic University - Gaza

Deanery of Research and Postgraduate Studies

Faculty of Education

Master of Curriculum and Teaching Methods

An invitation to evaluate vocabulary and visual thinking tests.

Dear

I am conducting a study to obtain a Master's Degree in Curricula and English Teaching Methods. The study is about:

**The Effectiveness of using Mind Mapping on the 3rd Graders’ Vocabulary Learning and Improving their Visual Thinking at UNRWA Schools.**

I would be grateful if you evaluate the vocabulary and the visual thinking tests as two instruments of this study to assess the performance of third graders in learning English vocabulary and improving their visual thinking skills. The gathered information will be used for research purposes. Because of the importance of your opinion, valuable experience and creditable feedback, you are kindly requested to look carefully at the tests, their items and question formats to determine if they are acceptable, relevant or irrelevant.

You are kindly invited to add your comments, modify or change if necessary, or even omit the inconvenient or irrelevant items according to your judgment and respected perspectives.

The researcher appreciates your cooperation.

**Researcher:**

Haneen Kamal Othman.
Dear student:

This test is designed for a specific research purpose. It aims at finding out how much vocabulary you learned and retained from units 7 and 8. The results of the test will not affect your school grades.

Instructions:

1. The test consists of 8 questions.
2. Read each question carefully.
3. Write neatly (with clear handwriting).
4. Make sure you do every question before moving to another one.

The researcher appreciates your cooperation and wishes you good luck.

Researcher:

Haneen Kamal Othman.
1. Complete the missing letter: (3 m.)
(l-r-u-h-i-y)

cloud....

....ot

co....d

s...nny

.....ainy

w....ndy

2. Complete the following dialogue from the list below : (3m.)

get - night - watch - evening - morning - go

Amal : Good afternoon , Rana .
Rana : Good afternoon , Amal .
Amal : What do you do in the ___________ ?
Rana : I __________ up .
Amal : When do you ___________ cartoons ?
Rana : In the ________________
Amal: What do you do at ____________ ?
Rana: I __________ to bed.
3. Re-arrange the words to form correct sentences:-(3 m.)

1. weather? - the - What's __________________________
2. sunny - It's - the - at - beach._____________________
3. umbrella. - under - She's - the ___________________

4. **Match the pictures with the words:** -(5 m.)

   ![Picture 1](image1)
   ![Picture 2](image2)
   ![Picture 3](image3)
   ![Picture 4](image4)

<table>
<thead>
<tr>
<th>Morning</th>
<th>go to school</th>
<th>night</th>
<th>do homework</th>
<th>play computer games</th>
</tr>
</thead>
</table>

5. **Write new words from the following:** -(4 m.)

1. Cartoons ____________  ____________
2. Afternoon ____________  ____________
3. Homework ____________  ____________
4. Go to bed ____________  ____________
6. **Classify:**


<table>
<thead>
<tr>
<th>weather</th>
<th>Times of the day</th>
<th>places</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. **Re-arrange the following events:**

   1. I do my homework. ( )
   2. I play football at the playground in the evening. ( )
   3. I get up in the morning. ( )
   4. I go to bed at night. ( )
   5. In the afternoon, it’s hot at the park so... ( )
   6. I go to school. ( )

8. **Re-arrange the letters:**

   1.  

      i v r e r   __________________

   2.  

      a n i r y   __________________

   3.  

      y a l p r o n d u g   ___________  __________

   4.  

      c h b a e   __________________
Appendix (4): The visual thinking test

Dear student:

This test is designed for a specific research purpose. It aims at finding out to what extent you acquired visual thinking skills from units 7 and 8. The results of the test will not affect your school grades.

Instructions:

5. The test is comprised of 22 multiple choice questions.
6. Read each question carefully.
7. Each question has 4 choices only one answer is possible.
8. Make sure you do every question before moving to another one.
9. Choose and draw a circle around the correct answer.

The researcher appreciates your cooperation and wishes you good luck.

Researcher:

Haneen Kamal Othman.
Choose the correct answer:-

1. It is ..................
   a. morning   b. evening   c. afternoon   d. night

2. I ..........................
   a. Go to bed      b. do homework   c. get up   d. go to school

3. It is ..................
   a. night        b. evening        c. morning      d. afternoon

4. I go to school in the ..................
   a. afternoon     b. night      c. morning      d. evening

5. The weather is ..................
   a. sunny      b. hot      c. windy      d. cloudy

6. It's ..................
   a. cold      b. rainy      c. windy      d. cloudy
7. How many children watch cartoons in the morning?
   a. zero      b. twelve      c. seven      d. one

8. The weather is .................
   a. windy       b. rainy       c. cold       d. cloudy

9. He's ................. to the trees
   a. on       b. under       c. next to       d. in front of

10. I eat ................. in the afternoon
    a. lunch       b. breakfast       c. dinner       d. supper

11. They're playing ................. the sand.
    a. under       b. on       c. next to       d. at

12. They're playing in the .................
    a. zoo       b. park       c. playground       d. beach

13. It's ................. today
    a. rainy       b. sunny       c. hot       d. cloudy
14. Which picture is going to bed:

a.  

b.  

c.  

d.  

15. The picture means that she ......................

a. eats lunch   b. gets up   c. watches TV.   d. goes to school

16. He goes to .................

a. bed   b. home   c. zoo   d. school

17. She is .................... the umbrella

a. on   b. under   c. in   d. between

18. She’s at ....................

a. home   b. garden   c. park   d. zoo

19. It’s .................... in the garden

a. cold   b. windy   c. rainy   d. sunny

20. This picture indicates ................ weather.

a. sunny   b. rainy   c. windy   d. hot
21. At night, I ...........................
   a. Go to school.
   b. Go to bed.
   c. Go to the zoo.
   d. Go to the park.

22. I watch cartoons at ...........................
   a. School.
   b. The market.
   c. Home.
   d. Playground.

Good Luck
At the end of this period, students are expected to:

1. Pronounce words correctly.
2. Talk about their daily routine.

New Vocabulary:

Get up – go to school – watch cartoons – play computer games – do homework – go to bed.


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>T. greets the students.</td>
</tr>
<tr>
<td></td>
<td>T. asks about the day/date.</td>
</tr>
<tr>
<td></td>
<td>T. plays Simon says with the students.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T. introduces the unit to the students.</td>
</tr>
<tr>
<td></td>
<td>T displays unit 7 poster. She elicits anything the students know (girl – bed – school- books – TV …etc.</td>
</tr>
<tr>
<td>Discussion</td>
<td>T. asks what the girl is doing in each picture.</td>
</tr>
<tr>
<td>Whole class</td>
<td>students brainstorm ideas with the teacher about their daily activities. T. draws a mind map on the board. In the middle she writes daily routine/ activities . she elicits anything the students say.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Individual work</td>
<td>T. new present the new vocabulary by using mind maps. She displays the flashcard and the word card for “go to school”. She plays the mp3, ss. Listen to the pronunciation then repeat. T. puts the word/flash cards on the mind map on the board.</td>
</tr>
<tr>
<td>S.B. ex. 1 p. 40</td>
<td></td>
</tr>
<tr>
<td>Homework</td>
<td>T. asks what do you do every day? She elicits the answers. T. gives the students a complete the missing letter exercise using a mind map.</td>
</tr>
<tr>
<td>Rounding up</td>
<td>Ss do the exercise in pairs.T. corrects few notebooks. T. elicits the answers. Ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T. introduces the exercise.T reads the tile of the exercise. She makes sure ss understand what to do</td>
</tr>
<tr>
<td></td>
<td>T. plays mp3.T models the first one. ss listen and answer. T. corrects few books, elicits the answers and ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>Draw a mind map about your daily activity.</td>
</tr>
<tr>
<td></td>
<td>Rapid revision: what do you do every day?</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Talk about their daily routine.
2. Arrange their activities chronologically.

New Vocabulary:

Get up – go to school – watch cartoons – play computer games – do homework – go to bed.


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>T. greets the students.</td>
</tr>
<tr>
<td></td>
<td>T. asks about the day/date.</td>
</tr>
<tr>
<td></td>
<td>T. plays hangman game with the students.</td>
</tr>
<tr>
<td></td>
<td>T. checks homework. She elicits the answer and ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T. revises the previously learnt vocabulary.</td>
</tr>
<tr>
<td></td>
<td>She draws a mind map in the middle and write daily routine.</td>
</tr>
<tr>
<td></td>
<td>She asks the ss what do you do every day?</td>
</tr>
<tr>
<td></td>
<td>T. distributes worksheets to the ss with the question write the word next to the picture Ss do the exercise individually.</td>
</tr>
</tbody>
</table>

![Daily Routine Diagram](image)
<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.B. ex. 1 p.41</td>
<td>T. corrects few worksheets. T elicits the answers, before that she puts the question in the worksheet on the board with flash/word cards</td>
</tr>
<tr>
<td></td>
<td>T. introduces ex. 1 (write and say)</td>
</tr>
<tr>
<td></td>
<td>T. models the first one.</td>
</tr>
<tr>
<td>E.B ex. 2 p. 41</td>
<td>T corrects few books and elicits the answers.</td>
</tr>
<tr>
<td></td>
<td>“Write” T. introduces the exercise, makes sure that ss understand what to do. T models no.1 Ss answer the rest of the ex. T corrects few books, elicits the answers and writes them on the board.</td>
</tr>
<tr>
<td>Homework</td>
<td>Re-arrange the letters to form correct words:</td>
</tr>
<tr>
<td></td>
<td>rtooCna ..................... tcaWh .....................</td>
</tr>
<tr>
<td></td>
<td>deB ..................... Soochl .....................</td>
</tr>
<tr>
<td>Rounding up</td>
<td>Rapid revision.</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Talk about their daily routine.
2. Say what time of the day they do things

New Vocabulary:

In the morning – in the afternoon – in the evening – at night – what do you do in the morning/ afternoon/ evening/ at night?


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>T. greets the students.</td>
</tr>
<tr>
<td></td>
<td>T. asks about the day/date.</td>
</tr>
<tr>
<td></td>
<td>T check homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T revises the words by displaying the flashcards and ss guess the word.</td>
</tr>
<tr>
<td>Homework</td>
<td>T displays unit 7 poster. She asks the ss what the girl is saying in each picture ( I get up)</td>
</tr>
<tr>
<td>checking</td>
<td>T points to the symbol for morning on the poster and asks in Arabic what time of the day this refers to? She elicits answers and repeats with other symbols.</td>
</tr>
<tr>
<td>Revision</td>
<td>T presents the vocabulary(morning – afternoon – evening – night)</td>
</tr>
<tr>
<td></td>
<td>She displays the word/ flashcard to the ss. T plays mp3 , ss listen then repeat.</td>
</tr>
<tr>
<td></td>
<td>T now draws a mind map on the board and writes times of the day in the middle. She elicits the times of the day and writes them. T selects a student to match the symbol with the word.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>T. gives the ss the following exercise</strong></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td><strong>Complete the missing letter: ( a - n - m - e )</strong></td>
</tr>
<tr>
<td></td>
<td><strong>T. gives the ss the following exercise</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ex.1 p. 42</strong></td>
</tr>
<tr>
<td></td>
<td><strong>T. explains the exercise to the ss.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>She corrects few notebooks, elicits the answers and writes them on the board.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>T. explains the exercise. She checks understanding.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>She corrects few books, elicits the answers and ss correct their work.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Homework</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Draw a picture mind map about times of the day</strong></td>
</tr>
<tr>
<td></td>
<td><strong>What do you do in the evening?</strong></td>
</tr>
<tr>
<td></td>
<td><strong>What do you do in the afternoon?</strong></td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Talk about their daily routine.
2. Use in and at correctly.
3. Use times of the day correctly

New Vocabulary:

In the morning – in the afternoon – in the evening – at night


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>t. checks homework. She elicits the answers and writes them on the board.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T. revises the previous lesson. She prepares word cards</td>
</tr>
<tr>
<td></td>
<td>what/do/you/ do/ in/the/morning/ afternoon/evening/ at /night.</td>
</tr>
<tr>
<td></td>
<td>t. displays word cards for what do you do in the morning? She</td>
</tr>
<tr>
<td></td>
<td>selects ss to form the question. Class confirms. T .points to each</td>
</tr>
<tr>
<td></td>
<td>card and the whole class repeats.</td>
</tr>
<tr>
<td></td>
<td>T. gives the afternoon word card to a student and asks him to</td>
</tr>
<tr>
<td></td>
<td>change the question using it. Class confirms. T repeats the same</td>
</tr>
<tr>
<td></td>
<td>with the rest of the words.</td>
</tr>
<tr>
<td></td>
<td>T. explains to the students that in comes ( morning – afternoon – evening)</td>
</tr>
<tr>
<td></td>
<td>and at comes with night through a mind map.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>T. gives the following exercise.</td>
</tr>
<tr>
<td></td>
<td>Complete with ( in – at):</td>
</tr>
<tr>
<td></td>
<td>1. …….. the morning.</td>
</tr>
<tr>
<td></td>
<td>2. ……. night.</td>
</tr>
<tr>
<td></td>
<td>3. ……. the afternoon.</td>
</tr>
<tr>
<td></td>
<td>4. ……. the evening.</td>
</tr>
<tr>
<td>Ex.1 p. 43</td>
<td>T asks ss to read the picture labels. She says one.. in the morning or in</td>
</tr>
<tr>
<td>Circle</td>
<td>the evening. She elicits in the evening. She models circling. T monitors</td>
</tr>
<tr>
<td></td>
<td>and gives help when necessary. Ss check their work in pairs. T elicits the</td>
</tr>
<tr>
<td></td>
<td>answers.</td>
</tr>
<tr>
<td>Ex.2 p. 43</td>
<td>T elicits the times in the picture in ex.1. she elicits them in chronological</td>
</tr>
<tr>
<td>Write</td>
<td>order. T tells the ss to rearrange the times of the day as they come during</td>
</tr>
<tr>
<td></td>
<td>the day.</td>
</tr>
<tr>
<td></td>
<td>T. corrects few books, elicits the answers and ss correct their work.</td>
</tr>
<tr>
<td>Homework</td>
<td>Ex.3 p.43</td>
</tr>
<tr>
<td>Rounding up</td>
<td>Sing a song</td>
</tr>
</tbody>
</table>

133
At the end of this period, students are expected to:

1. Talk about their daily routine.
2. Talk about when they do things
3. Use times of the day correctly

New Vocabulary/structures:

In the morning – in the afternoon – in the evening – at night – when do you go to school/ get up …. – what do you do in the morning / evening…..

A.V.M.


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board.</td>
</tr>
<tr>
<td>Revision</td>
<td>T. revises the structure what do you do….? She asks different questions to the ss orally.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T displays unit 7 poster. She asks when does the girl go to bed? She elicits at night. She repeats the same with other times of the day.</td>
</tr>
<tr>
<td></td>
<td>T prepares cards for when/ do/ you /get up/ go to school/ go to bed/ do homework/ play computer games… she selects ss and distributes the cards .T says when do you get up? ss form the question and the class confirms the answer.</td>
</tr>
<tr>
<td></td>
<td>T asks a student when do you do your homework and elicits the answer.</td>
</tr>
<tr>
<td></td>
<td>T now sums up the lesson by drawing two mind maps on the board to show the difference in answering between what and when.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Mind Maps" /></td>
</tr>
<tr>
<td></td>
<td>T explains that the answer to when is a time expression and the answer to what is an activity.</td>
</tr>
</tbody>
</table>
T gives the ss the following exercise:

1- Match :-

| 1- What do you do in the morning? | ( ) In the morning |
| 2- When do you go to school?       | ( ) At night       |
| 3- What do you do in the evening?  | ( ) I go to school |
| 4- When do you go to bed?          | ( ) I watch cartoons |

T elicits the activities in the pictures. she asks the ss to read the time expressions. T makes sure that ss understand what to do. She plays mp3 for no. 1 (in the evening) she says no. what does Walid do? She elicits playing with friends. She asks when? She elicits in the evening. T points to the text in the book and reads it aloud: in the afternoon. She says no and draws a cross and says evening and draws a tick on the board.

T plays mp3 so that ss can read each phrase and write a cross or a tick. T checks their work, elicits the answers and ss correct their work.

Answer:

1. When do you have lunch?
2. What do you do in the evening?

T asks ss to work in pairs taking turns and ask and answer questions.
At the end of this period, students are expected to:

1. Talk about their daily routine.
2. Talk about when they do things
3. Use times of the day correctly

New Vocabulary/structures:

In the morning – in the afternoon – in the evening – at night – when do you go to school/ get up …. – what do you do in the morning / evening…..


<table>
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<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td>Revision</td>
<td>T revises the previous lesson by asking oral questions:</td>
</tr>
<tr>
<td></td>
<td>What do you do at night?</td>
</tr>
<tr>
<td></td>
<td>When do you eat lunch?</td>
</tr>
<tr>
<td>Presentation</td>
<td>T starts the class with a human mind map. She writes the word daily activities in the center of the mind map. She prepares word cards for watch/cartoons/go to/school/get/up/go to/bed/do/homework/play/computer/games.</td>
</tr>
<tr>
<td>A human mind map</td>
<td>She distributes the word cards to the ss and tells them they have to complete the mind map e.g. ss with the word watch stands next to the central word in the mind map to form a branch. The ss with the word cartoons holds hands with the ss with the watch card. Thus forming branches of the mind map. Ss do the same with the rest of the words. The team that finishes first wins.</td>
</tr>
<tr>
<td>Ex. 1 p. 45</td>
<td>T asks the ss to read the questions aloud. She explains the pie chart. She points to the keys and explains that yellow is for morning, blue is for afternoon…etc.</td>
</tr>
<tr>
<td></td>
<td>T points to the yellow circle and reads the label aloud: go to school</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Homework</td>
<td>Write beautifully: I play computer games in the afternoon.</td>
</tr>
<tr>
<td>Rounding up</td>
<td>Sing time to be happy song.</td>
</tr>
<tr>
<td>Steps</td>
<td></td>
</tr>
<tr>
<td>Procedures</td>
<td>She asks yellow is …… she elicits in the morning. She also asks how many children go to school? She elicits 20. She repeats the same with other circles. She asks the ss to answer. She gives help when necessary. Ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>Complete the dialogue:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>T explains the exercise. She checks understanding. Ss do the exercise, T corrects few notebooks, elicits the answers and ss correct their work.</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Pronounce the new words correctly.
2. Describe the pictures.
3. Talk about the weather

New Vocabulary/ structures:

Sunny – rainy – windy – cloudy – hot – cold - weather


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>Hangman game</td>
</tr>
<tr>
<td>Presentation</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
</tbody>
</table>
|                        | T displays unit 8 poster. She asks what can you see in the poster? She elicits as much as possible ( playing football-swimming – zebra….)

T plays mp3 pointing to the type of the weather in the poster. She plays mp3 and ss listen. She holds the word/flash card and ss guess the meaning she puts the word and flash card in a mind map on the board.
<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex. 1 p. 46</td>
<td><strong>T</strong> gives the ss a complete the missing letter exercise. She prepares it on posters and divides the class into groups. ss work together to do the exercise.</td>
</tr>
<tr>
<td></td>
<td><strong>T</strong> reads the exercise, checks understanding, models no. 1. She asks the ss to answer the exercise. She monitors and gives help. She elicits the answers and ss correct their work.</td>
</tr>
<tr>
<td></td>
<td><strong>T</strong> asks ss to read the text aloud, plays mp3, pauses after 1st sentence. She says what’s the weather? She elicits it’s sunny. She says what picture? She elicits c.</td>
</tr>
<tr>
<td></td>
<td><strong>T</strong> says write and models writing 1 in the book. She plays the mp3 from the start, pausing for the ss to write each number by the correct picture. <strong>T</strong> elicits the answers and ss check their work.</td>
</tr>
<tr>
<td>Homework</td>
<td>Ex. 1 p. 47</td>
</tr>
<tr>
<td>Rounding up</td>
<td>What’s the weather today?</td>
</tr>
</tbody>
</table>

---

**Steps**: Ex. 1 p. 46, Homework, Rounding up

**Procedures**: T gives the ss a complete the missing letter exercise. She prepares it on posters and divides the class into groups. ss work together to do the exercise. T reads the exercise, checks understanding, models no. 1. She asks the ss to answer the exercise. She monitors and gives help. She elicits the answers and ss correct their work. T asks ss to read the text aloud, plays mp3, pauses after 1st sentence. She says what’s the weather? She elicits it’s sunny. She says what picture? She elicits c. T says write and models writing 1 in the book. She plays the mp3 from the start, pausing for the ss to write each number by the correct picture. T elicits the answers and ss check their work.
At the end of this period, students are expected to:

1. Brainstorm words related to weather.
2. Pronounce the words correctly.
3. Talk about the weather

New Vocabulary/ structures:

Sunny – rainy – windy – cloudy – hot – cold – weather- what’s the weather?


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td>Revision</td>
<td>T revises the previous vocabulary by asking the ss to match each word with its picture. T writes the words on the mind map and ss match them with the pictures.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T draws a weather mind map and asks ss to give her words related to weather.</td>
</tr>
<tr>
<td>Mind maps</td>
<td></td>
</tr>
<tr>
<td>Ex. 1 p.47</td>
<td>T elicits the pictured items and asks the ss to read the sentences aloud. She says read and match. She monitors and helps ss. Ss check their work in pairs. She elicits the answers and how they worked out each answer.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>T prepares word cards for what’s / the/ weather?/ It’s / sunny/ rainy…. T distributes the word cards for what’s the weather? To ss and asks them to form the question and the rest of the class confirms. she elicits a response … so on</td>
</tr>
<tr>
<td></td>
<td>T gives the following exercise.</td>
</tr>
<tr>
<td></td>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>T reads the exercise. She checks understanding. she models the 1st one. ss answer the exercise. T corrects few worksheets, elicits the answers, writes them on the board and ss correct their work.</td>
</tr>
<tr>
<td>Homework</td>
<td>Ex.2 p. 47</td>
</tr>
<tr>
<td>Rounding up</td>
<td>What’s the weather today?</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Pronounce the new words correctly.
2. Describe the pictures.
3. Talk about the weather in different places.

New Vocabulary/ structures:


<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>Hangman game</td>
</tr>
<tr>
<td></td>
<td>T checks homework. She elicits the answers and writes them on the board.</td>
</tr>
<tr>
<td></td>
<td>Ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T displays unit 8 poster. She elicits the places in Arabic. She asks</td>
</tr>
<tr>
<td></td>
<td>what’s the weather in each picture? Now the T presents the new vocabulary</td>
</tr>
<tr>
<td></td>
<td>with words and flashcards using mind mapping. She reads playground holding</td>
</tr>
<tr>
<td></td>
<td>the word and flashcard. Ss repeat after her. They guess the meaning.</td>
</tr>
<tr>
<td></td>
<td>T gives the ss a match exercise.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ex. 1 p. 48 listen and draw</td>
<td>T reads the exercise. She checks understanding. She models the 1st one.</td>
</tr>
<tr>
<td>Homework Rounding up</td>
<td><strong>1- Match :-</strong></td>
</tr>
<tr>
<td></td>
<td>![Images of place icons]</td>
</tr>
<tr>
<td></td>
<td>river swimming pool playground park zoo beach</td>
</tr>
<tr>
<td></td>
<td>ss answer the exercise. T corrects few worksheets, elicits the answers, writes them on the board and ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T holds sunny/zoo flashcards and asks what’s the weather at the zoo? Elicits sunny. She repeats the same steps with other places and types of weather.</td>
</tr>
<tr>
<td></td>
<td>T asks the ss to read the bubbles aloud. T draws a symbol for sunny on the board and elicits sunny. T now plays the mp3, pauses and says it’s hot at the swimming pool. Swimming pool which picture? She elicits 4. She says what’s the weather? She elicits it’s hot. She draws the symbol for hot on the board. She says listen and draw, plays the mp3 and ss answer the exercise.</td>
</tr>
<tr>
<td></td>
<td>Draw a weather mind map using symbols. What’s the weather at our school?</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Pronounce the new words correctly.
2. Talk about the weather in different places.

New Vocabulary/structures:

River – zoo – park – playground – beach – swimming pool – what’s the weather at….? It’s (sunny) at the (beach)


<table>
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<tr>
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<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td>Revision</td>
<td>T revises the previously learnt vocabulary. She draws places mind map and elicits places ss learnt.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T gives the ss complete the missing letters exercise on a worksheet</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ex. 1 p. 49</td>
<td>T reads the exercise. She checks understanding. She models the 1st one. Ss answer the exercise. T corrects few worksheets, elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T displays the weather word cards and elicits each one. She holds playground/rainy and asks the ss to give her a full sentence. She elicits it’s rainy at the playground. She repeats the same with other words.</td>
</tr>
<tr>
<td></td>
<td>T asks the ss to read the sentences aloud. She elicits the type of weather and pictured places. Ss answer the exercise in pairs. They check their work. T elicits the answers and ss correct the mistakes.</td>
</tr>
<tr>
<td>Homework</td>
<td>Draw places mind map using.</td>
</tr>
<tr>
<td>Rounding up</td>
<td>Sing what’s the weather song?</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Use prepositions correctly.
2. Talk about where people are.

New Vocabulary/structures:

Under – next to – on – in – at – where is he/she?


<table>
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<tr>
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<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td></td>
<td>a game</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T displays unit 8 poster. She elicits weather, places and a sentence e.g. It’s sunny at the park …</td>
</tr>
<tr>
<td></td>
<td>T plays the mp3 and points to each sentence said by the speaker.</td>
</tr>
<tr>
<td></td>
<td>- He’s at the zoo – she is in the swimming pool.</td>
</tr>
<tr>
<td></td>
<td>T asks, where are we? She elicits at school.</td>
</tr>
<tr>
<td></td>
<td>T brings a toy. She uses the toy to explain prepositions. She puts it in different positions and elicits their places.</td>
</tr>
<tr>
<td></td>
<td>T asks the ss to mention the prepositions they’ve learned on a mind map.</td>
</tr>
<tr>
<td></td>
<td>T prepares a poster for each group in the class with an exercise about prepositions. Ss work in groups to write the correct preposition next to the suitable picture/drawing. T monitors and helps.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Ex. 1 p.50</td>
<td>T asks ss to read the text aloud. She says one, he’s next to the trees. Which picture? She elicits d and models writing it. She says listen and check. She plays mp3, pausing so the ss can check and correct their work.</td>
</tr>
<tr>
<td>Listen and check</td>
<td>Ex. 1 p. 51</td>
</tr>
<tr>
<td>Homework</td>
<td></td>
</tr>
<tr>
<td>Rounding up</td>
<td>T holds a book and asks where is it? And elicits in the bag? She repeats the same with different positions.</td>
</tr>
</tbody>
</table>
At the end of this period, students are expected to:

1. Use prepositions correctly.
2. Talk about where people are.

New Vocabulary/structures:

Under – next to – on – in – at – where is he/she?


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<tbody>
<tr>
<td>Warming up</td>
<td>Greetings</td>
</tr>
<tr>
<td>Homework checking</td>
<td>T checks homework. She elicits the answers and writes them on the board. Ss correct their work.</td>
</tr>
<tr>
<td>Revision</td>
<td>T brainstorms previously learnt prepositions for revision by mind mapping. She uses a pen, changes its positions and asks where is it? Each time.</td>
</tr>
<tr>
<td>Presentation</td>
<td>T prepares word cards for where/ is/ he/ she/ are/ they/?/ on/ in / under/ next to. T distributes the word cards for where is he? To 4 ss. She asks the question and the ss have to make it. The rest of the class confirms the answer. She asks ss to change the question for she. She continues with they. T distributes a worksheet.</td>
</tr>
<tr>
<td>Steps</td>
<td>Procedures</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ex.2 p. 51 circle</td>
<td>T reads the exercise. She checks understanding. ss answer the exercise. T corrects few worksheets, elicits the answers, writes them on the board and ss correct their work.</td>
</tr>
<tr>
<td></td>
<td>T reads the exercise. Checks understanding. She elicits the correct option to complete the description of each picture. She says read and circle. Ss check their work in pairs. T elicits the answers and writes them on the board.</td>
</tr>
<tr>
<td>Homework Rounding up</td>
<td>Write beautifully: It’s cold at the zoo</td>
</tr>
<tr>
<td></td>
<td>Play chain game.</td>
</tr>
</tbody>
</table>
Appendix (6): Pictures
Complete the missing letters: (C-W-C-S-h-r)

- hot
- cold
- cloudy
- sunny
- windy

Weather
It's sunny

places

Swimming pool

river

beach

play ground

garden

park

weather

Sunny

hot

rainy
Match the picture with its weather:

- Windy
- Cloudy
- Cold
- Rain
- Hot
Match the picture with its word:

- windy
- sunny
- cloudy
- weather
- cold
- hot
- rainy
Match the word with its picture.

- Zoo
- Beach
- Swimming pool
- Playground
- River
- Park
Weather

- sunny
- rainy
- cloudy
-indy
- ainy
Match the picture with its word:

- windy
- sunny
- cloudy
- weather
- cold
- hot
- rainy