Mohamed Khider University of Biskra
Faculty of Letters and Languages
Department of Foreign Languages

MASTER THESIS
Letters and Foreign Languages
English Language
Science of the Language

Submitted and Defended by:
IZZGHECHE Kaouthar

On : Tuesday, 22 September 2020

The role of brain-based learning strategy in developing

middle school pupils' vocabulary retention

Board of Examiners :

Mr.	AMRAOUI Khaled	MAB	University of Biskra	Examinateur
Mr.	BECHAR Maamer	MAA	University of Biskra	Supervisor
Dr.	SEGUENI Lamri	MCB	University of Biskra	Président

Academic Year : 2019-2020

Dedication

To the Almighty Allah the Lord of the world for his guidance and help and to whom I owe everything.

I dedicate my dissertation work to my family and my friends. A special feeling of gratitude goes to my loving parents, Saleh and Laila Izzgheche whose words of encouragement and push for tenacity ring in my ears. Who planned the hope in my blood, to those who opened my eyes to the world, to my beloved and dearest parents, words can never express my deep love to you. To my shining diamond, to my beloved brother Houssem Izzgheche. To the candles and the joy that enlightened our family, to My lovely little sisters Bouchra and Djawaher. To the light of my eyes, to my wonderful special sister Soundous who have never left my side. To my loyal, truthful, ,and loving friend Amina with whom I am sharing life with its lights and shadows. A very special thanks goes to my brother and friend Brahim Douida for his help, patience. And his continuous moral support. Not least of all, I owe so much to my whole family for their undying support, their unwavering belief that I can achieve so much.. Unfortunately, I cannot thank everyone by name because it would take a lifetime but, I just want you all to know that you count so much. Had it not been for all your prayers and benedictions; were it not for your sincere love and help, I would never have completed this thesis. So thank you all.

Acknowledgements

This work would not have been completed without Allah's help, guidance,

and enlightenment, for God we owe the greatest thanks.

We are massively thankful to our supervisor Mr. Bechar Maamer for his

sustained efforts, giddiness, and support.

We are also indebted to Mr. Segueni Lamri and Amraoui Khaled for

devoting time in reading and evaluating this modest work.

We are extremely thankful for those teachers who were sincerely caring,

giving, and understanding throughout the whole educational life.

We would like to extend my gratitude to middle school pupils and teachers who participated in this work for their collaboration and assistance they provided.

Other appreciation goes to All my classmates in the division of English Language.

We thank All my relatives, teachers and all the staff in the Department of English at the University of Biskra.

Abstract

The retention of what has been learned as vocabulary for a long period of time is a challenge for many pupils. That is, throughout the learning process, students are always prone to forget their learned vocabulary due to many causes. Accordingly, the present research aimed at investigating the efficiency of brain based learning in enhancing pupils' vocabulary retention. Moreover, it sought to explore teachers' attention toward the brain based learning strategy. This study hypothesized that brain based learning strategy can help pupils develop their vocabulary retention. To achieve the intended aims and test the hypotheses, , descriptive qualitative research method was adopted. To gather data, a semi-structured questionnaire and a semi-structured interview were used as data collection methods. The population of this study was middle school pupils and teachers. The findings revealed that brain based learning strategy is a teaching and learning strategy that helps to a great extent pupils to promote their learning thus their retention. In addition to that teachers have positive attitude toward the strategy and they are willing to initiate it. Thus, it can be concluded that the research hypotheses were confirmed.

Key words: brain-based learning, vocabulary retention, teaching strategy.

List of Abbreviations

BBL: brain-based learning

BBT: brain-based teaching

OI: orchestrated immersion

AP: active processing

RA: relaxed alertness

List of tables

List of figures

Table of contents

General introduction

Introduction

Vocabulary is considered as one of the most important components for students in learning English as second language. Knowledge of vocabulary is the raw material for all thoughts and feelings to be expressed and conveyed through the medium of language. Though, learning vocabulary is quit challenging and students generally complain that the vocabulary they learned is always in the circle of remembering and then forgetting. In other words, they are unable to retain the vocabulary words for a long period of time. Hence, designing a structured and effective strategy to develop learners' vocabulary retention has to be considered as the first priority. In order to help learners not to get frustrated assist them enjoy language learning, we should find appropriate ways to develop their stock among the strategies of vocabulary. One that can be used is the brain-based learning strategy that help the learners to reduce forgetting and promote their long-term retain memory.

Statement of the problem

Vocabulary is central to English language learning/ teaching because without sufficient vocabulary pupils cannot understand others or express their ideas. As it is required for all other language skills such as spiking, writing, listing, and reading. Vocabulary mastering is not an easy aspect in language learning; hence learners face some difficulties in learning vocabulary especially in mastering, recalling, and retaining them. As the goal of learning vocabulary is to remember words to use them in different contexts, teachers always try to find ways to improve their students' learning of vocabulary items thus they retain them effectively.

Significance of the study

The research purposes initially are to give contribution for English middle school pupils. As well to pinpoint the Brain-based strategy that seems helpful and effective for pupils to learn and retain English words. Hence, it may be significant to teaching and learning English vocabulary.

Aims of the study

This study aims to:

1. Determine the effectiveness of Brain-based learning strategy on pupils' vocabulary retention.

2. Investigate to what extent brain-based learning strategy could help pupils to improve their vocabulary retention.

3. Draw out the teachers' attention toward Brain-based learning strategy.

Research questions

Regarding the above mentioned problem, the following questions are raised:

1. How could Brain-based learning strategy improve pupils' vocabulary retention?

2. Is Brain-based learning strategy effective on pupils' vocabulary retention?

3. What are teachers attitude towards brain based learning strategy?

Research Hypothesis

Based on the research questions cited above, the study particularly aims at testing the following hypothesis:

- If Brain-based learning strategy is used while teaching vocabulary, pupils' vocabulary retention will be enhanced, and retention difficulties can be traced.

Research methodology

In order to investigate the effectiveness of Brain-based learning strategy on middle school pupils' vocabulary retention, a descriptive qualitative method is used in the research. The study was carried out with middle school pupils and teachers, the data was conducted through questionnaire and an interview in order to obtain sufficient data for this study.

Research tools

In order to seek answers to our research questions and for the sake of testing the validity of our hypothesis. Gathered data for the study was investigated through a questionnaire and an interview.

Research delimitations

The study is concerned with investigating the effectiveness of Brain-based learning strategy in developing middle school pupils' vocabulary retention.

Structure of the study

The research consists of three main chapters, theoretical part, divided into two parts, and practical part organized as follows:

Chapter one provides definitions of vocabulary, and provides vocabulary importance and its types, vocabulary teaching, teaching vocabulary techniques, learning styles, the main difficulties in learning vocabulary, vocabulary retention, types of memory, reasons behind forgetting words, and finally multimodality.

Chapter two deals with definition of Brain-based learning strategy, The Brain, basic parts and functions, brain-based learning principles, brain and learning, brain-based teaching, brain-based vocabulary strategies, brain-based vocabulary instructions, some Brain-based vocabulary activities, and advantages of Brain-based learning in vocabulary retention.

The last chapter deals with the data analysis of the research, the practical work of the study. It focuses on analyzing the result that will be obtained to test the hypothesis.

Chapter one: vocabulary retention

Introduction

Vocabulary plays a prominent role in teaching and learning a language as it is an essential aspect of reading and listening as well as speaking and writing skills. It is the most important component of any language learning. Besides, learners tend to retain the maximum number of vocabularies to be able to understand the language and use it. Hence, in this chapter we will shed light on vocabulary, its definition, importance, discuss techniques of teaching it, and focusing more on the reasons behind forgetting words.

1. Definition of vocabulary

Vocabulary is one of the basic elements of language, for that various specialists and researchers try to precisely define the term vocabulary. According to Graves (as cited in Taylor,1990) vocabulary is defined as the entire stock of words belonging to a branch of knowledge or known by an individual. Additionally, McArthur (1992) states that:

> vocabulary derives from the Latin word "vocabularium" which Is a
> list of vocabulary words. The medieval vocabularium was a list of
> Latin words to be learnt by clerical students. It was usually arranged
> thematically, with a translation equivalent in vernacular language
> (p.1090)

This means that vocabulary is a set of words in a language which has a sense and defer in meaning from one topic to another one.

According to Oxford Learner's Dictionaries (2019), vocabulary is defined as "all the words that a person knows or uses". This means vocabulary refers to the words which are used by individuals in order to communicate. Krashen (as cited in Herrel, 2004) states that lexicon organizes the mental vocabulary in the speaker's mind. An individual's mental lexicon is that person's knowledge of vocabulary (krashen as cited in Herrel, 2004). Moreover, Gutlohn, Galton and Diamond (2006) found that learning words means to be aware of its sense in order to understand it and to be more familiar. In addition, Gardener (2009, as cited in Adger, 2002) states that vocabulary is not only

confined to the meaning of words but also includes how vocabulary in a language is structured, how people use and store words and how they learn words and the relationship between words, phrases, and categories of words (Graves, 2000, as cited in Taylor, 1990).

Furthermore, Richards and Renadya (2002) implied that through vocabulary learners can master speaking, reading, writing, and listing; therefore, it is the essential and basis of the language. In addition, vocabulary is fundamental of language. More precisely, learners can produce words in speaking and writing which help them to communicate effectively.

From the definitions above, it can be concluded that the term vocabulary refers to words that are needed to convey a certain meaning and such words differ from one language to another. Then, teaching and learning vocabulary can help learners to develop their language abilities.

2. The importance of vocabulary

There is no doubt that vocabulary knowledge is important in any language whether it is first, second, or foreign language. Simply because it is the first and foremost stage before any other learning aspect of the language. Though, learning a language is mainly learning its vocabulary as Cameron (2001, p.72) mentions that vocabulary is central to the learning of a foreign language.

Wilkins (1972, p.111) said that "without grammar very little can be conveyed, without vocabulary nothing can be conveyed". He means that in learning a language grammar is not sufficient and more importance is given to vocabulary, because language without vocabulary meaning cannot be transmitted and communication cannot occur. Further, Vocabulary mastery is the largest and most important task facing the language students as Swan and Walter states. In addition, Cameron (2001) mentioned that vocabulary is a fundamental and essential component of the language. Thus, to master a language, it is necessary to learn vocabulary.

Nation (2001) describes the relationship between vocabulary knowledge and language use as complementary: knowledge of vocabulary enables language use and, conversely, language use

leads to an increase in vocabulary knowledge. Moreover, Lewis (1993, p.89) argued, "lexis is the core or heart of language". In this sense, learning productive vocabulary enables learners to improve the four language skills (reading, writing, listening and speaking). Finally, Rasekh and Ranjbary (2003, p.3) pointed "that vocabulary knowledge is known to play a key role in the individual's proficiency in both first and second language". This means that vocabulary knowledge takes a vital role in language learning as it is crucial for successful language use and in the formation of complete spoken and written texts.

From the explanation above, it can be concluded that vocabulary has a significant role in language learning to sustain other language skills. Along with the importance of vocabulary development for learners' proficiency level as it represents a crucial part in the learners' life.

3. Types of vocabulary
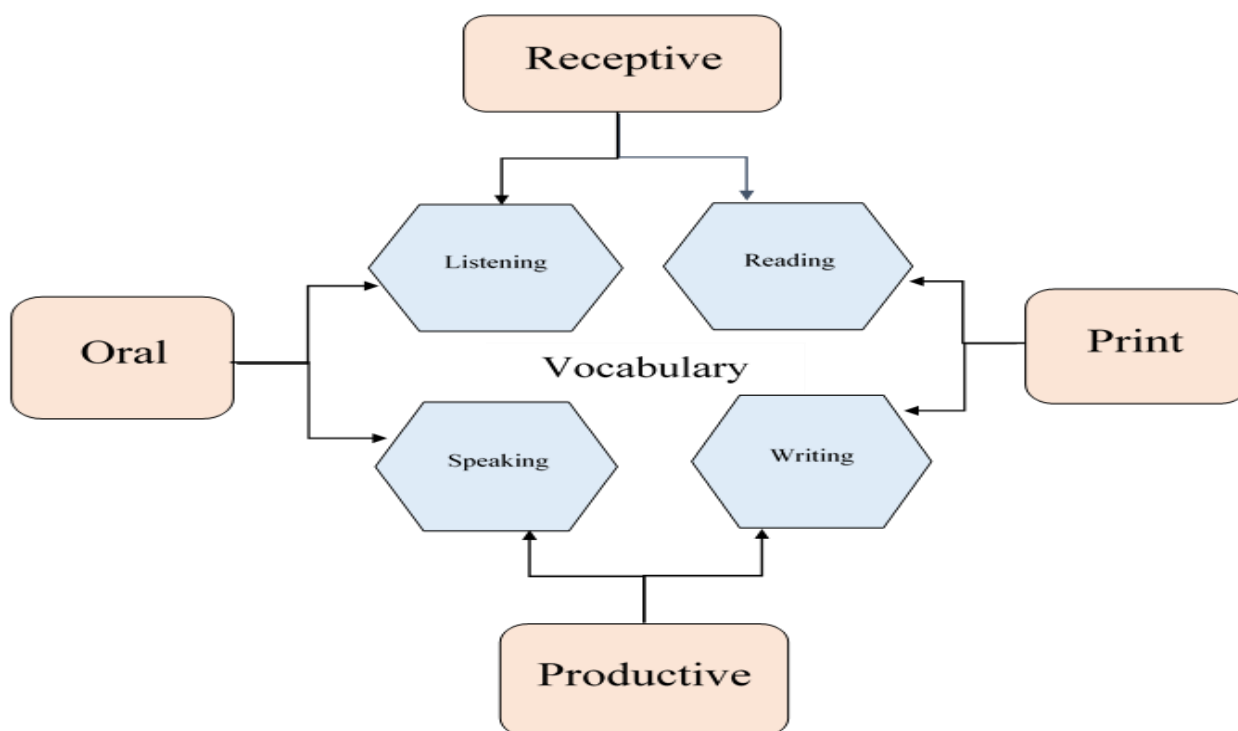
Figure 1: vocabulary forms

Dealing with vocabulary leads to talk about types of vocabulary. Various scholars and researchers distinguish between two kinds of vocabulary. The first type is passive (receptive) vocabulary, the second type is active (productive) vocabulary.

3.1. Receptive vocabulary

According to Aebersold and Field (1977), passive or receptive vocabulary refers to language items that can be recognized and understood in the context of reading or listening (as cited by Jr 2016). Additional definition suggested by Palmer (1921, p.118), "receptive carries the idea that we receive language input from others through listening or reading and try to comprehend it". In other words, receptive vocabulary means those language items which can only be recognized and understood in the context of reading and listening materials. Also, Crow and Benjamin (2013) state that in receptive vocabulary, learners do not give much importance to the spelling and pronunciation of words. Further, Hycraft (1978, p.44) implied that "those which the students recognize and understand when they occur in context but which he cannot produce correctly" . The students can understand these kinds of words in the text, but they find difficulty in production.

3.2. Productive vocabulary

Productive vocabulary carries the idea that we produce language forms by speaking or writing to convey a message to others (Nation, 2001). According to Gains and Redman (1986), productive vocabulary refers to language items which the learner can recall and use appropriately in speech and writing, in addition, they thought that through listening and reading the same item several times in the classroom, the passive vocabulary transmitted to active vocabulary. According to Hedge (2000), active vocabulary is when learners have the ability to produce words in writing and speaking. Additionally, (Gilbert & Beatrice, 2005)show that productive vocabulary is all the words the student understands, plus all the words that they can use and produce to express their thoughts and explain exactly how they are feeling to others.

4. Vocabulary Teaching

Classrooms are the first place where students acquire new vocabulary for that teachers are required to teach vocabulary in their classes to help their students. However, the way to teach vocabulary becomes the main concern of most English language teachers, they look up for new methods and strategies to help their students to be enough vocabulary learners. In addition, Schmitt (2000) stated that to teach vocabulary you have to take many factors into consideration as the type of learners, types of words, and to the curriculum requirements. Besides, Hallowell (1992, p.3) affirms that teachers should follow a certain methodology to improve their student's comprehension of vocabulary as she claims that "intonation, gesture, facial expression, action and circumstances all help to tell them what the unknown words and phrases probably mean". Therefore, there are different techniques suggested for teaching vocabulary.

5.   Teaching vocabulary techniques

There are several techniques that can be applied in teaching vocabulary. Yet, teachers should vary techniques in teaching vocabulary process so that it will be more effective and help learners to memories words. Thus, many ways and techniques have been provided by scholars to teach vocabulary; such as Gains and Redman (1986), Allen (2011), and Thornbury (2002). The techniques divided into two groups: visual techniques and verbal techniques.

5.1. Visual techniques

Generally, in these techniques, learners learn through what they see. It constitutes two main techniques which are visuals, mime and gestures.

5.1.1. Visuals:

Allen (2011) ensure the importance of using visual aids to teach vocabulary, especially with beginners. Visual techniques include flashcards, wall charts, drawings, photographs, and projects as Scott (2002) suggests. He gives more emphasis to pictures and objects that allow the learners to think of the word individually or within a group. Besides, these techniques are used for conveying meanings and they are valuable for teaching tangible items and other areas of

vocabulary such as places, professions, actions and activities, and description of people. Furthermore, demonstrating words through visuals may be a helpful vocabulary technique because learning some information visually can attract learners' attention and involve them in the lesson. Accordingly, some researchers pinpoint the importance of visual vocabulary teaching due to the fact that in the learning process, the visuals encourage and motivate both analytical learners and visual ones.

5.1.2. Mime and Gestures:

These techniques are used additionally as another way of conveying the meaning of a word by involving in games besides miming and demonstrating actions. It is useful to memorize the meaning of the vocabulary items especially concrete words. Tellier (2008) declared that integrating gesture with the lexical in presenting vocabulary is a way which helps learners retrieve words more. According to Gains and Redman (1986), teachers may incorporate the blackboard (whiteboard nowadays) and gestures in order to reinforce teaching the meaning of words with an illustration so that learners can remember them.
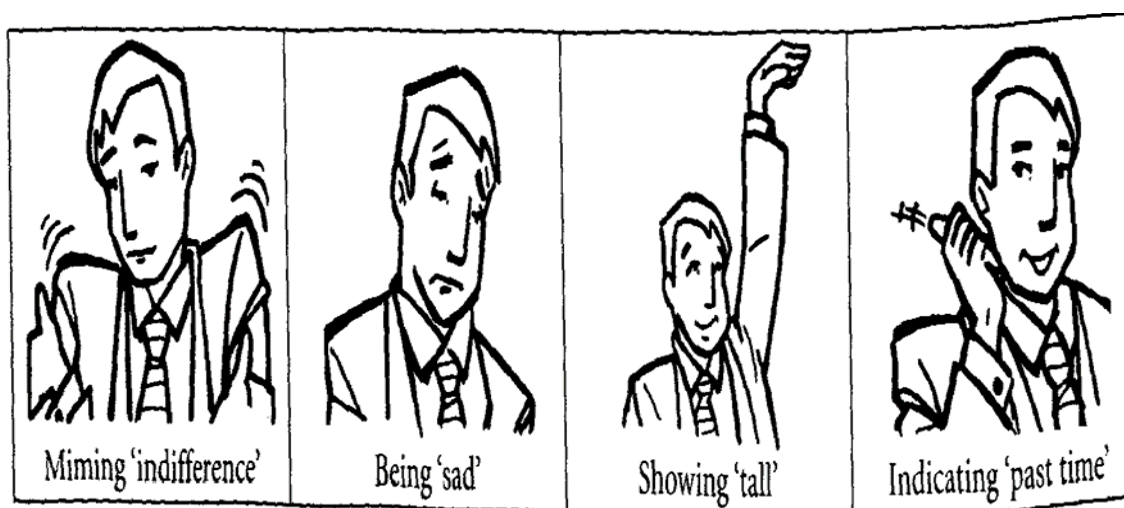
Figure 2: mime and gestures by Harmer

5.2. Verbal techniques

This technique is used when teachers cannot use real objects to the classroom, instead they use words to explain other words. Thornbury (2002) mentioned that it requires learners to work to find the meaning of the word or to use it in the sentence.

5.2.1. Illustrative forms

In case of abstract items, teachers use different situations to illustrate different concepts that make the student grasp these concepts' meaning easily (Gairns and Redman, 1986, p.74). Also, they vary the meaning of the word to help them grasp it.

5.2.2. Synonyms and antonyms

According to Grains and Redman (1997) teachers often use this technique as a way of teaching the meaning of words with low-level learners. In order to deal with this technique, teachers clarify the meaning of specific words by providing example then they use synonymy to explain the meaning of items. For instance, to explain the meaning of "humorous", the teacher directly use the synonym "funny" or simplify some words meaning by telling for example students that "Miserable" meant "very sad". Moreover, sometimes using synonyms of words alone is inadequate as a technique to convey the meaning which requires contextualized examples to clarify the meaning of the items. Consequently, they have proposed antonymy as another way to teach vocabulary meaning. As with synonymy, antonymy is an alternative technique to illustrate or present words and their meanings. Therefore, learners can grasp the sense of such items; for instance: it is useful to explain the term, "Sour" by contrasting it with "sweet" which would already be known by intermediate level students. Nevertheless, it is necessary to illustrate the contexts in which these items are taking place.

5.2.3. Scale:

It is another way to teach vocabulary meaning. It is a useful way of revising and feeding what students have learnt in contrasted and related items. According to Grains and Redman (1997) through scales learners can learn new words as well as revising the previous contrasting and related

words. For example, learners know hot and cold which are way for feeding in warm and cool and latter freezing and boiling

5.2.4. Translation:

Translation is the process of giving the equivalence of words in the target language from a mother tongue. It is considered as an effective way of transmitting meaning and messages as it does not consume a lot of time. Yet, it is not useful because learners find difficulties in remembering the meaning of words and they fail to improve an independent L2 language lexicon. Despite that, the translation technique is a dangerous way of teaching, since it affects learners' learning of L2 or any new language. Cameron (2010) claims that translation preferable to be avoided in explaining new words, rather, there must be extensive use of the other visual and verbal techniques to not affect the foreign language vocabulary attainment.

6. Learning styles

A learning style is "an individual's mode of gaining knowledge" (Dictionary.com, 2012). Learning styles are defined as "the complex manner in which, and conditions under which, learners most effectively perceive, process, store, and recall what they are attempting to learn" (James and Gardner, 1995). Moreover, Mortimore (2003) indicates that learning styles are seen more in terms of the strategies that learners use to deal with learning and are considered to be less stable. Thus, learning styles, as opposed to learner preferences, can be stretched with the passage of time. Learning styles group in together different ways individuals prefer to learn. They categorize people based on their "style" of learning or the way they learn best. Every individual has a unique learning preference that falls into one, some or all of these categories. There are a few different models to explain learning styles. One of the most popular is the VARK model created by Neil Fleming. Who categorized learning styles into four main types:

The visual learning style is considered to be a "process through which students gain knowledge and understanding through explicitly visual tools" (Lewis, 2012). The kinesthetic learning style

means that the student learns best when they are permitted to touch and feel through physical activity (Lewis, 2012). The auditory learner learns best when they are able to hear the instruction (Fleming, 2012).

6.1. Visual

Fatt (2000) says that people with a visual learning preference "see the world by constructing or remembering mental images" (p. 35). Fatt added that visual learners would prefer reading, observing, and the display of data and visual aids. However, Visual students would rather learn by watching movies, film strips, pictures, and graphs which help integrate the subject (Fatt, 2000). When taking a test, a visual learner would do better on the test if the test had visual diagrams (Fatt, 2000).

In addition, Students who show a preference for a visual learning style and are given instruction with visual aids will perform better when given the appropriate materials (Cegielski et al., n.d.). Hence, Teaching strategies used for visual learners could include demonstrations, pictures, or graphs (Coker, 1996). Some keywords that can be used to get a visual learner to pay attention are seeing, looking, imagining, observing, searching, and perceiving (Coker, 1996).

6.2. Auditory

Learners with an auditory learning preference prefer a sound and make better decisions on what they have heard or read (Fatt, 2000). Fatt says that auditory learners would prefer lectures, seminars, discussions, and tapes. However, by letting auditory learners listen to tape recordings of material, they are more likely to ask questions about what they have learned, and may not have understood (Fatt, 2000). When taking a test, an auditory learner would do their best by being given an oral examination (Fatt, 2000).

According to Davis & Franklin (2004), the auditory learners learn best through listening. In addition, the auditory learners consider to be exclusive, they have high, neutral, or low aptitudes for auditory environments" (Davis & Franklin, 2004, p. 54). According to Coker (1996), "The

learner may also want to visually compare his or her technique to a model demonstrating the desired movement" (p. 67). By using keywords teachers can maximize the retaining of information with students (Hardy, 2010). Some keywords to use with auditory learners include rhythm, hear, detect, tempo, and flow (Coker, 1996).

6.3. Read/ write

Students with the read preference prefer printed word and text as a method to gain information. Learners who are considered to be reading/writing learners prefer lists, glossary, textbooks, lecture notes, or circulation. These learners would prefer to arrange lecture notes into sketch form, paraphrase classroom notes, and study multiple choice exam questions (Murphy et al., 2004). According to Drago and Wagner (2004), read/write learners are note-takers. They study better through note taken from lecture or from difficult reading materials. Hence, Read/Write learners prefer information displayed as words and text-based input and output. Therefore, teaching strategies used for reading/writing learners could include PowerPoint, internet, lists, dictionaries, and thesauri.

6.4. Kinesthetic

The individuals with a kinesthetic learning preference communicate with the environment by feelings or feeling. Learners who are considered to be kinesthetic learners prefer to learn by doing, trial and error method of learning" (Fatt, 2000). A kinesthetic learner would be learning with hands-on experience which helps them create and develop what they have learned (Fatt, 2000).

In addition, giving a test with task-oriented questions a kinesthetic learner would have better results (Fatt, 2000). A person with a kinesthetic preference of learning has "the ability to use the body to build rapport, to console, to persuade, and to support others (Silver et al., 1997).

7. Difficulties in learning vocabulary

The first steps in successful teaching vocabulary are to identify the difficulties faced by the students. Thornbury (2004, p.27) proposes some factors that make some words more difficult:

7.1. Pronunciation

Research shows that words that are difficult to pronounce, usually contain sounds that are unfamiliar to some learners, are more difficult to learn. Additionally, for learners, "words with clusters of constants such as 'strength' or 'crisps or breakfast' are problematic" (Thornbury, 2002, p.27). That means the words contain clusters are difficult to pronounce and may confuse students while learning, for example, two consonants in the same word.

7.2. Spelling and grammar

Researchers such as Nurgan (2010. P, 7) indicates that students who have mismatches in sound-spelling, have little, or no knowledge about the silent letters in words find difficulties when learning vocabulary. Besides, a spelling of a word confuses many students, especially words that contain silent letters as foreign, listen, headache, muscle. (Thornbury, 2002, p.27). Also, there is difficulty in leaning a word when a grammar is associated with it, especially if this differs from that of its L1 equivalent. Grammatical forms are considered as sort of confusion for many L2 learners. An example of this, remembering whether a verb is followed by infinitive or "-ing" form such as: concerning, or to be concerned about

7.3. Length and complexity

It is noticed that long and complex words are difficult to learn. Many students find it hard to learn long words than short ones. According to Thornbury (2002, p.27), "high-frequency words tend to be short in English, and therefore the learner is likely to meet them" often.

7.4. Meaning

When learning a new word, students find difficulty in meaning. Thornbury (2002, p.28) said that "students confuse between two words when they overlap in meaning i.e. both are close to one meaning, such as "make" and "do". Therefore, sometimes words with multiple meanings are difficult to be learned by many students and harder to retain them.

8. Vocabulary retention

Vocabulary retention has been defined as "the ability to recall or remember things after an interval of time. Yet, in language teaching, retention of what has been taught may depend on the quality of teaching, the interest of the learners, or the meaningfulness of the materials" (Richard & Schmidt, 2002). Vocabulary needs to be retained in the mental lexicon or long-term memory before it can be recalled and produced in meaningful sentences. Therefore, retention is a memory storage process, which does not refer to vocabulary intake in class. Atkinson and Shiffrin (1968) describe this process as having different stages after a word comes in and attention is paid to this by the learner, a transfer to short-term memory takes place. Repetition of this information causes a word to be transmitted to long-term memory, whereas in case of a lack of rehearsal the word is removed from short-term memory, and is lost (Hummel, 2013). According to Farr (1986.p.25), "retention the outcome of successful learning seems to be a straightforward concept one that we typically measure by having the learner recognize, recall, repeat, or reproduce what he was acquired."

9. Types of memory

According to Thornbury, learning grammar is essentially rule-based-system; whereas, vocabulary knowledge requires learners to recall words not only to learn them. Merriam-Webster defines memory as the power or process of recalling what has been previously learned or experienced.in addition, Preston (2007) states that memory is the mental capacity or brain's ability to recover, retrieve, and remember past events, impressions, and facts. However, Zhang (2004) states that depending on the amount of time the memory lasts, memory is divided into three types: sensory memory, short-term memory, and long-term memory.
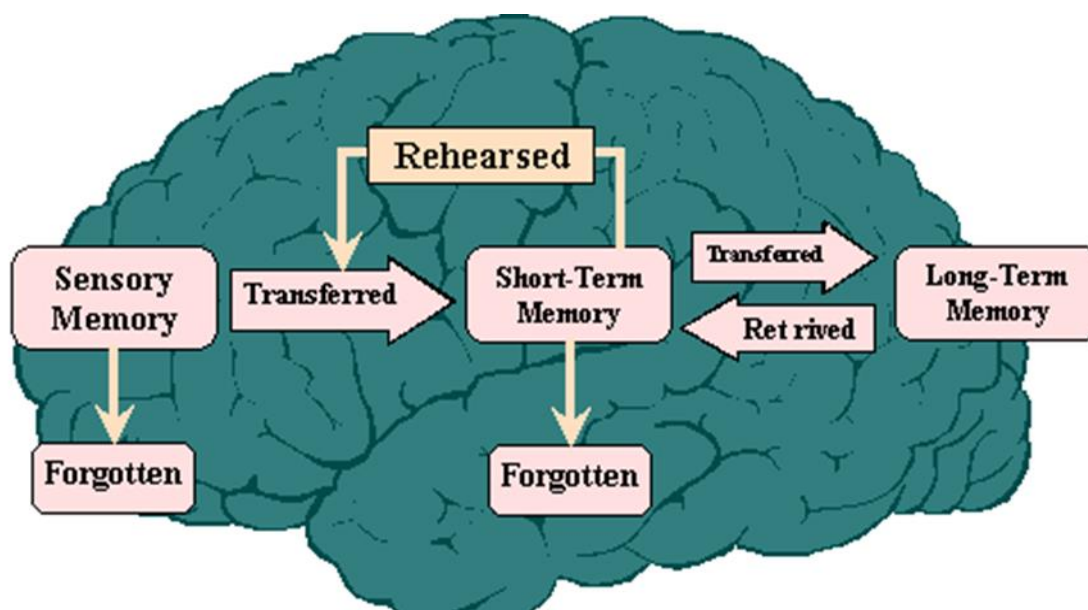
Figure 3: Types of memory

9.1. Sensory memory

Sensory memory holds sensory information for less than one second after an item is perceived. The ability to look at an item and remember what it looked like with just a split second of observation, or memorization, is an example of sensory memory.

9.2. Short term memory

When the information lasts from several seconds to a few minutes, the memory is then called short-term memory (Zhang, 2004). Preston (2007) refers to short-term memory as primary, active, and working memory. Short-term memory keeps the information which is already being processed, such as a new word encountered for the first time (Baddeley, 2002). Short term memory is fast but has a very limited capacity to hold information in an active and readily available state for a very short time (Amiryousefi & Ketabi, 2011).

9.3. Long term memory

Long-term memory is the memory which lasts anywhere from an hour to a lifetime (Zhang, 2004). Sweller and Chandler (1994) indicate that long-term memory has unlimited storage capacity and can hold an indefinite amount of information provided that some changes happen in

the long-term memory. The learning of any material, such as vocabulary, is the result of a change in a learner's long-term memory. However, appropriate alterations to long-term memory should be the primary aim of instruction in vocabulary learning environments (Pass & Sweller, 2014; Sweller, 2005), but the long-term memory processing is relatively slow.

10. Reasons behind forgetting

Despite the different ways to store words in long-term memory, there are difficulties to remember them. Ruth and Stuart (1986) claimed that there are reasons which lead learners to forget words. In order to explain the phenomenon of forgetting several theories of why forgetting occurs have been proposed. Ebbinghaus developed a forgetting curve according to his findings, much of what we forget is lost immediately after it is originally learned. And the amount of forgetting eventually stabilizes (Ebbinghaus, 1913).

The Decay theory further proposes that memory fades over time. Information is, therefore, less available for later retrieval as time passes and memory, as well as memory strength, wears away. It also states when something new is learned, a neurochemical, physical "memory trace" is formed in the brain and as time passes this trace tends to decay, unless it is occasionally used (Oberauer & Lewandowsky, 2008). In other words, the reason why we eventually forget something is that the memory of it fades with time. According to this theory without practicing or revising the new information will gradually disappear from memory. However, the cue-dependent forgetting theory asserts that learners do not find difficulties to store the new information, but they are unable to recall and retrieve the information. In both cases, providing cues or relevant information to the learnt words may facilitate the recall, for example, the teacher may use 'furniture' as a cue to help students recall 'sofa', 'armchair', thus facilitate the retention of words (Gairns & Redman, 1986)

In addition, they add that the mental activities which are undertaken before or after receiving the input. These activities affect the learning and retention of words, i.e. the activities are

undertaken before learning may affect learning ability of the new input. Likewise, the activities undertaken after learning influence the new input.

Moreover, they believe that if learners are tested about the new input in a short time, they will be able to recall them. In contrast, if learners are tested about the new information after a long period of time, they will not be able to recall them. In other words, the amount of time can cause forgetting therefore learners need to revise and do activities in order to facilitate the retention in long term memory.

11. Multimodality

Multimodal learning suggests that when a number of senses (visual, auditory, and kinesthetic) are being engaged during learning, learners understand and remember more. By combining these modes, learners experience learning in a variety of ways to create a diverse learning style. multimodality in learning is an active, student-centred approach in which students select the resources most relevant to them (Mayer, 2001). This means that students are responsible for organizing learning content such as words and images into coherent verbal and visual models comprising their mental schemata and conceptual structures (ibid.). The essence of multimodality, therefore, is to provide different types of resources to the student for stimulating learning in meaningful ways within and across disciplines. To this end, multimodality is described as an interdisciplinary approach drawn with an emphasis on communication and representation (Jewitt, 2013). This is directly relevant to teachers in terms of using current theories of learning to engage students with student-centred pedagogies and resources of learning (Hassett & Curwood, 2009). Multimodality in classrooms refers to 'multiple' modes of representation, with combined elements of print, visual images and design (Jewitt, 2008). Multiple modes of representation include capabilities of combinations of oral and written language, visual, gestural, tactile and spatial representations (Cope & Kalantzis, 2009). This transitional shift from print-based education to multimodal education indicates the need to rethink how teaching and learning are conceived,

approached and practiced. For Kolb and Kolb (2005), meaningful learning does not occur in a single way, but in unity of circulation because the brain works in a unity while learning. Teaching should start with the exploration of the brain.

Conclusion

In conclusion, learning any language depends on vocabulary development. So, vocabulary is a necessary component yet most of the learners find difficulties in learning new words. More specifically, learners fail to recall and to produce vocabulary which they have learned. However, teachers are required to select teaching techniques and strategies that may build an appropriate atmosphere and motivate students to improve their vocabulary retention. This chapter shed light on the importance of vocabulary, the reasons behind forgetting words, and techniques of teaching vocabulary.

Chapter two: brain-based learning strategy

Introduction

Findings in the field of Medicine have provided acknowledgement of the human brain and a better understanding of how humans learn. Hence, scientific development brings changes to learning strategies, this has caused a new learning strategy to arise. Brain-based learning is student-centered which processes differently than traditional teaching methods. Brain-based learning is based on the idea that each part of the brain has a specific function when related to learning.

1. Brain-based Learning

Recent innovations in science have allowed an unprecedented look into the way the brain works. Brain research has provided new knowledge about the many ways that humans learn. Different than traditional methods, brain-based learning emphasizes meaningful learning instead of memorization. In other words, the brain does not easily learn things that are not logical or meaningful.

Brain-based learning has been defined as calibrating teaching in accordance with the way the human brain naturally learns (Caine & Caine, 1994, p. 44). According to Madrazo and Motz (2005), brain-based learning is the use of "research in neuroscience on how the brain works to gain an understanding of how students learn and develop in a classroom" (p. 56).

Brain-based instruction is an education that is specifically tailored to reflect current knowledge of how the brain processes and utilizes knowledge. The underlying rationale behind the value of brain-based learning is that neural connections in the brain, those connections that represent the formation of knowledge, are dynamically created and modified throughout a person's lifetime (Berger, 2005).Yet, brain-based learning is best defined as "the engagement of strategies based on principles derived from an understanding of the brain" (Jensen, 2008, p. 410). Teachers use strategies that they feel effectively reach all students' individual needs. Being that all students learn differently; teachers must use their knowledge of the brain and how it learns to decide upon the strategies they consider to be brain-based. However, Khongnawang (2007) defined BBL as

learning based on the structure and function of the brain. Kaewwan (2007) claimed that BBL use the understanding of the function of the human brain to shape teaching methodology. Also, BBL is a way of thinking about the learning process. It involves accepting the rules of how the brain processes, and then organizing instruction bearing these rules in mind to achieve meaningful learning (Caine and Caine, 1994).

According to (Jensen (2000), brain-based learning is learning in accordance with the way the brain is naturally designed to learn. Jensen (2008) added that brain-based learning is a set of principles and a base of knowledge and skills upon which we can make better decisions about the instruction as well as learning processes. Hence, the brain-based learning technique has a dual focus: it encourages teachers to adapt their teaching methods to the learning modes of all students, and it seeks to create a challenging yet safe emotional climate in the classroom (Connell, 2009).

Brain-based Learning help providing the opportunity for students to enhance their learning capability by energizing the brain through activities in the classroom to make it expand its storage capacity to uphold knowledge and help the learner reach a maximum potential about the subject matter. brain-based learning includes accepting the rules of brain processing and organizing the teaching according to these rules in the mind for meaningful learning. Brain-based learning is students centered learning that utilizes the whole brain and recognizes that not all students learn in the same way. It also constructs their own knowledge in a variety of learning situations and contexts. (Caine and Caine, Geoffrey, Renate and Sam Crowell, 1999). Although brain-based learning is a concept which tells how fusion of a common sense, human experiences and brain researches produce useful tools and principles for the classroom environment, it does not give us a map to follow. It provides us to think about the structure of our brain at the stage of making the decision. Brain-based learning is to learn with the brain in mind. (Jensen, 2000). Similarly, LeDoux (1996) states that experiences, thoughts and memories are always embedded in emotions and corresponding physiological and psychological states.

Neuroscience has disclosed important information about the brain and how it learns. It has uncovered 'unprecedented revolution od knowledge about the human brain, including how it process, interprets and stores information' (souse,1998).

2. The Brain

Learning is the most important process in human life. Learning mainly takes place in the brain. Therefore, the study of brain and related parts is essential to facilitate the learning and retaining processes. The students' awareness of learning consciously will be enhanced knowing that they are learning for a valuable reason. Yet, one should know the brain first and how it functions in order to use it for optimal learning.

The human brain is a fascinating but complex organ that theorists like Caine and Caine (1994) compare it to a city in which landmarks are connected with wires, while Jensen (2000) compares it to a rain forest jungle with its unique survival ability depending on what influences it. It is an integral organ in our body (Howard-Jones, 2010) that it deals with emotions, learning, movements, and thoughts in every human being.

The human brain weighs around 1.5 kilograms, humans have large brains relative to body weight. It works as the receiver and giver of information for all the systems in our body. Wolfe (2001) the defines brain as the source of one's "cognition, memory, thoughts, and intelligence". However, teachers do not need to become psychologists or neuroscientists in order to know how the brain operates. We only need to acknowledge that teaching can become more effective when we know how the brain senses, processes, stores, and retrieves information (Perry, 2005).

Hence, it is impossible to separate the brain and learning. Knowledge of the brain and its functions could only lead to a better understanding of how it works that would benefit the teachers and learners at the same time.

3. Basic Parts and Functions

The brain is responsible for the senses and reflexes in our body. It deals with the thinking process including the things that we store in our memory. It communicates to the different parts of our body through its cells. It changes throughout an individual's life. These changes are age-related as well as through experiences (Howard-Jones, 2010).

To understand how the brain learns, a basic understanding of the anatomy and physiology of the brain is necessary.

3.1. cerebrum

the largest part of the brain is called the cerebrum. It is divided into two halves, better known as hemispheres. Each hemisphere is further divided into four lobes or four regions namely: frontal lobe, parietal lobe, occipital lobe, and temporal lobe. Each lobe is responsible for specific activities, and each lobe depends on communication from the other lobes, as well as from the lower centers of the brain, to complete its jobs.
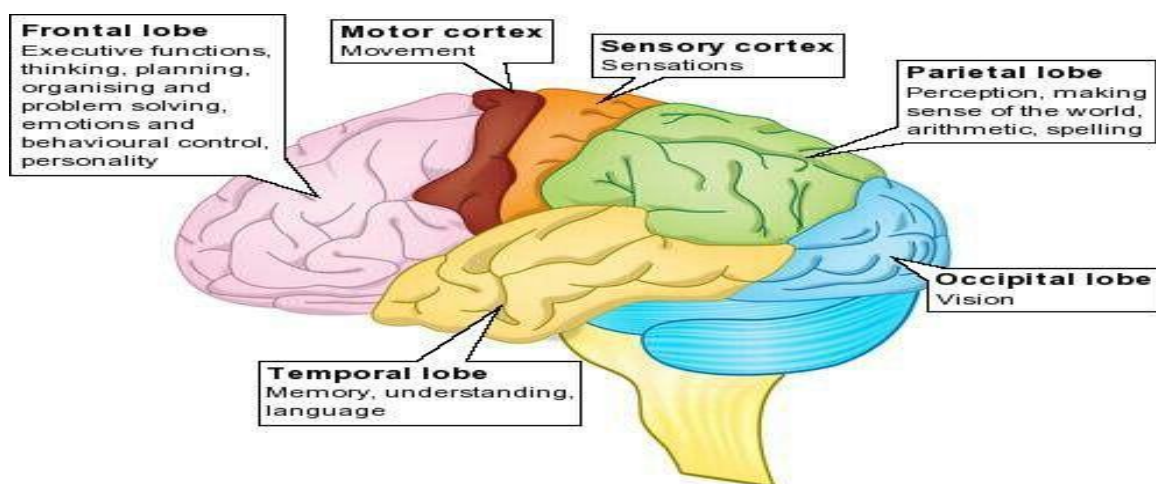
Figure 4 Lobes of the brain

The frontal lobe is found behind the forehead. It is involved with purposeful acts like judgment, creativity, problem-solving, abstract thought processes, and coordination of movement and planning. The parietal lobe is right behind the frontal lobe which located at the top back portion of the brain. It processes sensory information like touch, pain, taste, and pleasure. It also concerns

with language functions. The occipital lobe is located at the middle back of the brain and is primarily responsible with vision, reading and recognition of objects. The temporal lobe is involved with hearing, memory, music, emotions, and meaning. It is located above the ears.

Every task that the brain completes requires communication and coordination among several of its parts. The brain is composed of over 100 billion neurons that are interconnected by electrical circuits. Two important cells found in the brain are called neurons and glial cells. These two cells are responsible for learning things and storing information or throwing it away.
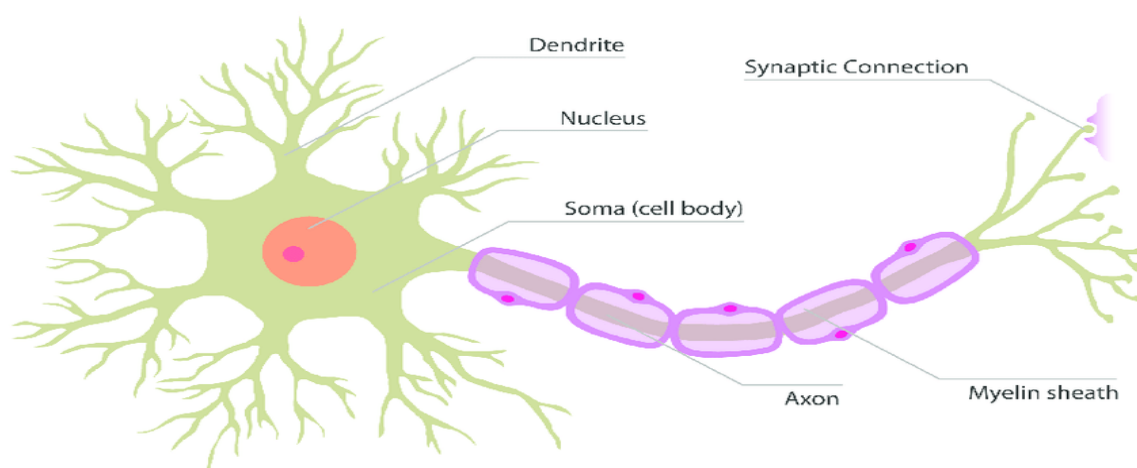
Figure 5 Neuron

Neurons or nerve cells make connections with other neurons as an individual learns. Learning is simply defined as "two neurons communicating with each other" (Sprenger, 1999:2). Every new experience an individual has changed the brain and causing the neurons to sprout new branches, called dendrites. When a neuron communicates with another neuron, the message goes to the dendrites, moves down to the axon, and moves across the synapse to the dendrite of another neuron. Axons modify and grow in response to any brain activity, such as learning. Learning puts demands on the brain, and the brain responds by developing new circuits to connect new information to current or past knowledge, the creation of neural networks and synapses are what constitute learning (Sousa,2000, p 20). When neurons continuously bond with each other, the

connections are easier to make. This helps facilitate remembering and making the students learn a new lesson by connecting it to their past knowledge.

3.2. Cerebellum

The cerebellum is the little ball-shaped area that sits at the back of the brain, under the cerebrum, and controls functions such as balance. The cerebellum does not initiate any function, but rather reacts to nerve impulses in the muscles. A person who has damaged their cerebellum cannot coordinate movements, tie a shoelace, catch a ball, or complete a handshake.

3.3. Brain stem

The brain stem helps in motor activities and sensory pathways to body and face. It acts as a relay center connecting the cerebrum and cerebellum to the spinal cord. It performs many automatic functions such as breathing, heartbeat, body temperature, wake and sleep cycles, and digestion.

4. Brain-based learning principles

Caine (1990) & Caine (1994) established a brain-based theory of learning with 12 basic principles that apply to classroom instruction as a result of their research and constant study about the brain and how it learns. The principles constitute a strong connection between the neurosciences and education, as well as introducing the human learning process. These principles are considered as the basis for teaching the students by engaging the brain. These are the following:

4.1. The Brain Is a Parallel Processor

The human brain is always doing many things at one time. Therefore, teaching must be based on theories and methodologies that guide the teacher to make orchestration possible. Teachers need a frame of reference that enables them to select from the vast repertoire of methods and approaches that are available

4.2. Learning engages the entire physiology

The brain is a physiological organ functioning according to physiological rules. Stress and threat affect the brain differently from peace, challenge, boredom and happiness. Everything that affects our physiological functioning affects our capacity to learn. Hence further, the students' experiences affect their learning in a much broader sense. The way they are treated and accepted as individuals in the classroom will affect their interaction with the teacher, classmates and the course they are taking. Other physiological necessities, like good health and good rest, also affect the passivity or activeness of the student in class. The brain works well in a non-threatening environment coupled with students' good nutrition and habit. Hence, it is better for the teacher to provide proper activities in the class that would encourage the students to become engaged and interested.

4.3. The search for meaning is innate

The human brain in its nature tries to make sense of our everyday experiences. Therefore, in our classes, we need to excite our learners and arouse their curiosity. Our learners need to discover information themselves. In this way, they will be challenged. Therefore, Teachers should give more challenging activities to the students that would help them familiarize the things that they are learning.

4.4. The search for meaning occurs through patterning

Patterning refers to the meaningful organization and categorization of information. The brain is designed to perceive and generate patterns. Learners can learn better if they can create meaning between what they are studying and their personal life. Once they are able to connect the pattern and get the value of what they are doing, the students will then feel free to express themselves and get involved in classroom activities.

4.5. Emotions are critical to patterning

What we learn is influenced and organized by emotions. Emotions are crucial to memory because they facilitate the storage and recall of information. The emotional climate in the school

and classroom must be monitored on a consistent basis. The environment needs to be supportive and marked by mutual respect. Students and the teacher need to maintain a harmonious relationship with respect and acceptance of each other in and out of the classroom. This kind of relationship will affect the learning of the students in a way that they will feel free to express their idea without fear of being criticized or insulted.

4.6. The brain/mind processes parts and wholes simultaneously

The brain is divided into right and left hemispheres which interact with each other. There are significant differences between the left and right hemispheres of the brain. However, the two hemispheres are interactive. While one side reduces information into parts, the other side works with it as a whole.

4.7. Learning involves both focused attention and peripheral perception

The brain absorbs information of which it is directly aware and to which it is paying attention. This means that the brain responds to the entire sensory context in which teaching or communication occurs. In order for students to be enthusiastic in learning, the teacher should show enthusiasm first of all. This will draw the students' attention to the learning material and process, where they will see the importance of learning the course. Visual materials should also be provided.

4.8. Learning involves both conscious and unconscious processes

The teacher needs to provide a connection from the students previous learning to make a connection and create meaning of what they are currently studying. This process prepares the students' unconsciousness to work favorably, then consciously takes in the new information at hand.

4.9. We have at least two types of memory: spatial and rote

A Spatial Memory System Learning is the humans natural, spatial memory system which is unlimited and is always at work and does not need rehearsal, that we remember without doing

anything to process it. For instant memory of experiences like remembering the dress that we used yesterday. However, Rote memory id facts and skills that are dealt with I isolation and organized differently by the brain and need to be practiced and prepared in order to keep them for a long-term basis, like repetition. Teachers need to know that teaching devoted to memorization does not facilitate the transfer of learning and actually will interfere with the development of understanding.

4.10. We understand and remember best when facts and skills are embedded in natural, spatial memory

People learn languages through multiple interactive experiences involving vocabulary and grammar. the language is shaped both by internal processes and social interactions. Therefore, success in learning a second language will depend on using all the senses and immersing the learner in a multitude of complex and interactive experiences. When learning activities are integrated into real-life experiences, learning and retention are enhanced.

4.11. Learning is enhanced by challenge and inhibited by threat

A good challenging activity can awaken the students' interest as they learn in class and positive emotional experiences enhance long term memory (Jensen, 2000). Still, the brain downshifts under threat, and it learns optimally when appropriately challenged. Therefore, activities should be chosen carefully so as not to stress the students and lessen their interest.

4.12. Each brain is unique

Each person has a brain but the experiences and the system of the whole being is different in every individual. Which means, the teacher should provide varied choices in the classroom to attract the student's brains to become interested in learning.

5. Brain and learning

The human brain has basically many functions in life, which among the most important, involves learning. the brain and learning approach incorporate the latest scientific research about the brain and how students learn. It uses a curriculum, instructional methods, and programs to

increase students' ability to make connections and retain new information. However, some areas of the brain have long been known to be strongly related to language ability, for instance, the Broca's area. Located in the left frontal lobe, which is responsible for speech production and articulation, and the Wernicke's area, in the left temporal lobe, associated with language development and comprehension. Language learning, however, is a complex procedure that scientists have determined is not limited to any hemisphere of the brain, but instead involves information exchange between the left and the right sides. While learning, the brain produces electrical signals which are transmitted by neurons throughout the body. Learning is a matter of making connections between the brain cells and the experiences of an individual. Every new experience a person encounters alters electrochemical wiring of the neurons. When the brain is motivated the neurons get connected faster through dendrites. The more novel and challenging stimuli, the more likely it will be to activate learning.

Learning involves groups of neurons or neural networks. One neuron's axon connects with a second neuron's dendrite terminals. When a nerve impulse occurs in the first neuron, neurotransmitters are released from the axonal terminal the first neuron and are received by the receptors of the dendrites' spines of the second neuron. However, this junction between two neurons is called the synapse and this process occurs while learning. Therefore, brain science with education is an upcoming way of learning and teaching.

6. Brain-based Teaching

Brain-Based Teaching is viewed as one of the kinds of such learner-centred teaching methods, using students' cognitive endowments (Caine & Caine, 2002). The process should be student-centred rather than teacher-centred (Jenses, 2007). Learners' active engagement in the teaching-learning process is regarded as a factor contributing to the enhancement of the quality of education (Saleh, 2012).

Teachers should use non-traditional approaches or strategies including brain-based teaching to incorporate the needs of learners (Sousa, 1998). Contrary to the traditional schooling, which is often claimed to limit learning by disregarding the brain's natural learning processes, the Brain-Based Teaching boosts learning because of its holistic strategy towards the learners (Caine & Caine, 2002). This strategy of learning focuses on the brain's best natural operational principles, with the aim of inducing maximum attention, understanding, meaning, and memory (Jensen, 2007).

It is critical for teachers to energize the learners' brain to keep them moving and growing more knowledge. Brain-based Learning is focused on the reality that everybody learns and that the brain has an immense power to process that learning. Thus, Caine & Caine (1994:69) attest that "learning is positively affected by relaxation and challenge and inhibited by perceived threat and fatigue. Stress is considered harmful in learning." A pleasant atmosphere should be experienced in the classroom where the students learn so that they will be free from inhibitions and be able to express themselves well. Sprenger (1999) notes that there is a great need for students to participate in a realistic environment where they can try new things. Merely showing something to the students is not enough for effective learning to occur. It is important for them to do hands-on learning as they connect the existing information to the current knowledge they gain and be able to retain them for future use (Wolfe, 2001; Caine and Caine, 1994).

As students learn in a sensible and meaningful way, the information learned is retained in their memory bank (Sousa, 2001; Sprenger, 1999). That means, when teaching the students, the teacher should associate the words with something concrete like real-life situations or real objects to provide meaning in remembering since the human brain is both visual and textual and can remember better when the words are aided with objects (Paivio and Csapo, 1973). As a facilitator of the students' learning in the classroom, the teacher's challenge is in choosing the right activities and materials to develop retention among the students. Such activities should help the students

keep the information and knowledge they have learned in class from their short-term to their long-term memory, thus, enabling them to draw such knowledge from their brain whenever the situation calls for it. Jensen (2005) states that the "only way we know that students have learned something is if they demonstrate recall of it" (p.125).

However, teachers would find it easy and fun to teach when the students' brains are engaged – that is when all their senses are involved. When students are focused on the things that they are concerned with, they will be able to link the new information to their previous experiences, thus creating more meaning to what they are learning at present. They are believed to respond positively in classroom activities which they could make sense of and where their five senses are working actively. Classrooms that promote brain-compatible teaching and learning allow students to experience challenges. Challenging activities make the students think and be active in class. As they participate in the activities, they would have a feeling that they belong since emotional well-being allows the intellectual capacity of the students to function well (Marchese, 2002). The students interact well when they know they are respected and will not be laughed at even when they commit a mistake, thus giving them the courage to participate in class. In this approach, feedback should be provided immediately for the students to know where they are at in terms of learning.

As Kaufman et al. (2008) maintain, meaningful learning is achieved when teachers enhance learners' awareness of course content by making the classroom environment rich to incorporate physical, emotional, and social dimensions. It adjusts the point of the classroom from teaching to learning (Kaufman et al., 2008). Brain-based teaching approach combines the following factors (Sousa, 1998):

- ❖ involvement of emotions
- ❖ enriched environments
- ❖ music

❖ movement

❖ meaning-making and the absence of threat for maximum learner participation and

❖ achievement

Caine and Caine (2002) mention three elements including Relaxed Alertness (RA), Orchestrated Immersion (OI) and Active Processing (AP). As they put it, in order to make the learning environment relaxed, the teacher can create a high level of rapport with students by taking a friendly strategy.

6.1. **Relaxed Alertness**

which means, providing relaxing teaching/learning environment creates an optimal emotional and social climate for learning. Hence, relaxed though challenging teaching environment with minimal threats provides effective learning practices (Gulpinar, 2005).   In other words, challenging but non-threatening and confirmative environment with complex social interactions. Learners' interest in the material taught optimizes their learning, and relaxed brain triggers learn. Therefore, teachers should do their best to eliminate fear in the learning environment (Caine, Caine, & Crowel, 1999)

6.2. **Orchestrated immersion**

while for orchestrated immersion Caine and Caine (2002) believe that the teachers can take various measures including interesting, exciting, and motivating activities in the process of teaching. As Caine and Caine (2002) state, "the learning environment should be interesting, rich, practical and full of hands-on activities" so effective teaching practices involve student's concentration on the contents they learn. Learners also have to use memory to explore the content that is characterized by holistic and correlative nature (Caine&Caine,2002). Therefore, teachers should incorporate interactive and information-gap activities.

6.3. **Active processing**

Concerning active processing, Caine and Caine (2002) assert that students' real-life experiences should be embedded in the lessons and become the focus of attention. Also, Duman states that learners with active brains achieve meaningful learning through memory work that relates new objects to the ones already exists in the cognitive structure. Thus, teachers should allow learners to consolidate and internalize information through active processing (Caine & Caine, 1991) for example encourage the learners to think of events similar to the themes of the lesson and relate them to their classroom activities.

7. Brain-based vocabulary strategies

The brain-based classroom strategies are one of the results of the studies made about the brain and its ability to learn. These strategies are carefully planned and considered very valuable for language learning and retention development of the students. In these strategies, brain-based learning principles are seriously taken into consideration to help students learn and retain vocabulary in a natural way. These principles are their gateway to achieving the desired goals.

7.1. Grouping or chunking

Putting the words in groups is good way to learn new vocabulary. Grouping the nouns together on one side and verbs on the other, for example, helps the students identify the new word and how it functions. By doing so, they will feel more confident to use the words they have learned as they know what it is and how it's being used.

Example: "View" and "temple" are nouns while "carved" and "restore" are verbs. Students should be able to group them accordingly with the guidance of the teacher during the activities.

7.2. Repetition

Nation (2001) suggests that the repetition of vocabulary is crucial in the students' fluent use of the language. Meeting the words once is not enough for every student to internalize its usage and meaning because there is so much to learn for every word. Repetition is the key to vocabulary retention. However, learning words and their meanings by heart is boring. Thus, teachers need to

come up with interesting games and activities to motivate learners to engage with vocabulary on a regular basis.

Some of example repetition games:

- ❖ Pictionary: learners draw a word and their team must guess the word from their drawing
- ❖ Half a crossword: learners must complete a crossword with a partner; each learner must make up clues to give their partner
- ❖ Back to the board: one member of each team sits with their back to the board; the teacher writes a word or phrase on the board and the other members of the team must describe it to the one with their back to the board

7.3. Word association

Associating words with concrete things is another way of learning new words in class. It will be easier for the brain to commit a new word to memory when it is associated with something concrete. Thus, object association is a valuable tool in enhancing vocabulary. Yet, it becomes necessary to find a way to put the words into context. In other words, teachers should spend some time on the usage of the words in order to help learners find hooks to connect the new words with those they already know or visualize them in their own way.

8. Brain-based Vocabulary Strategy Instructions

Brain-based vocabulary instructional strategies are ways of making connections with students that promote long-term memory and retention.

8.1. Verbal-visual association

The verbal-visual association selected strategy modified by Hopkins and Bean includes a picture of the word. As its name suggests, it has two sides visual and verbal. The verbal part of this strategy involves the definition and examples of the target word understudying while the visual part of the strategy includes its drawings or pictures. Hopkins and Bean (1999) claim that

vocabulary learning through visual images can help students remember a word's definition. The facilitative value of pictures has been also found and acknowledged in recent brain neuroimaging studies by Chee et al (2002). Therefore, this strategy can be used to increase students' visual processing leading to their much understanding of vocabulary instruction. Wolfe (2001) and Monroe (1998) agree with this view and urge teachers to use visual information is memorable and enhances students' understanding.

8.2. Semantic mapping

According to Sokman (as cited in Huang, 1999), semantic mapping refers to "brainstorming associations which a word has and then diagramming the results"(p.387). Evidence obtained from brain-based research reveals that the brain is a pattern-seeking device which has a tendency to make associations between learned materials and previous learning experiences. Thus, integrating prior knowledge with learned materials is crucial for optimal learning a new word. Moreover, the structures of mapping instruction, such as semantic mapping can reflect the structure used by human brains to organize or store information (Wolfe, 2001; Weiss, 2000) and satisfy the existing criteria that we know about the brain. Semantic mapping not only provides students with a visual means of organizing content information, but it functions in a way that brain acts while sorting information. In fact, the brain constructs information contently. The use of semantic mapping has been empirically demonstrated to facilitate student success in vocabulary development.

In fact, applying this vocabulary instruction is to allow language learners' brain to make a solid neuron networks of information intertwined and interacted to each other firmly which will help them to have long stable data of vocabulary.

8.3. Sentence plus Definition

This vocabulary instruction strategy not only evolves students with rich information about each word through multiple exposures to vocabulary items, but it stresses that students need to learn the connection among several words by using them in natural occurrences in real sentences, phrases

and clauses. However, often active involvement mostly leads to deep processing in learners' brain. Active involvement occurs when teachers provide their students with rich information. Neuroimaging studies (Chee et al., 2003) also suggest that a positive learning outcome can be expected from active and deep processing of the materials, whether the learning goals are lists of words or complex concepts. Genesee (2002) also claims that with experience, practice, and exposure the neural circuits will become more complete by listing evidence gained from brain research. Moreover, researchers (Read, 2000; Schmitt, 2000) have pinpointed that word knowledge has a complex nature; teachers should provide their students with rich information about each word through multiple exposures to vocabulary items (Asselin, 2002; Foil & Albert, 2002). This method suggested by Greenwood (2002) is suitable for teaching new words representing known concepts. Furthermore, this method offers real context where a single word can be used out of vocabulary lists. It provides students' brain with direct exposure to using words in the real situation. At first, teachers present students with a sentence using this new word and its definition. Then, students are required to learn this word. Following examples indicates how this method exposes student with rich information around a word.

New vocabulary	Example	Definition
Bell	The children arrived at school just as the <u>bell</u> was ringing.	The machine that makes a loud noise to signal the start and end of the school day
Sneaker	He put on his <u>sneaker </u>to go jogging	Casual shoes with rubber bottom
Suit	Today the headmaster is wearing a black <u>suit</u>.	a jacket and skirt that is made from the same material

Table 1: sentence plus definition examples

9. Some Brain-based vocabulary activities

Brain-based vocabulary activities provide students with vocabulary practice to help them study words in meaningful, brain-based, different ways.

9.1. Individual Vocabulary Notebook

This strategy suggested by Greenwood (2002) is a tool to establish a link between the definitions of a word and pupils' personal experiences. Fowle (2002) asserted that individual vocabulary notebooks were found to act as an effective tool for exposing learners to a vast variety of vocabulary learning strategies and appeared to be non-threatening to both learners and teachers. It could be used to complement other classroom activities aimed at increasing learners' lexical competence and retention.

9.2. The Concept Circle/ Concept Wheel

According to Vacca and Vacca (2005), Concept Circles allow students to study words critically and conceptually. The Concept Circle is a categorizing strategy which can encourage brainstorming and discussion and display the links between previous conceptual knowledge and new words being encountered.

9.3. The Frayer Model

The fryer model is a chart with four sections designed by Dorothy Frayer and her colleagues at the University of Wisconsin which can include a definition, some characteristics/facts, examples, and non-examples of the word/concept. In the Frayer model, teachers provide students with a word or term that represents a concept. Using a variation of the Frayer model provided by Stahl and Nagy (2006), students and their teacher discuss what the word is, what it is like, and examples and non-examples.

9.4. Graphic organizer

according to Hall (2008), graphic organizers are visual representations or visual displays that show the connections of facts in pictures. Graphic organizers are two-dimensional visual arrays showing relationships among concepts. it is often used as prompts for students to construct ideas, organize and/or sequence vocabulary, plan what to write, organize words, or context clues to complete the blank area as synonyms, antonyms, prefixes, suffixes, root words, definitions, parts of speech, and more. What the students need to do in most cases is to fill in the blanks. The ability

to color-coded thoughts in a picture can help significantly in understanding and remembering the vocabulary.

9.5. Flashcard

Flashcard is a cardboard consisting of a word, a sentence, or a simple picture on it in either or both sides (Komachali & Khodareza, 2012). Flashcard is considered as a helpful strategy because of its benefits. Moreover, teachers can also use flashcards for drilling and presenting new words. young learners can build their own imagination from the pictures they saw in flashcards. Likewise, young learners need visuals or realia to make them interested in something they learnt. Pictures on flashcards are a valuable aid. They bring the image of reality into the unnatural world of the language classroom. Joklova (2009,p. 19).

10. Advantages of brain-based learning in vocabulary retention

Memory is not a unitary concept and the different areas of the brain join in the encoding and retrieving tasks (Moghadam & Araghi, 2013). The essence of teaching using BBLA is that it implies understanding how the brain works best to increase learning to the highest degree (Pool, 1997). Therefore, teaching the English language through BBLA does not focus on enhancing academic achievement for a short time, but it enhances the possibilities of keeping information and knowledge learned for a long time. It is a way to improve learning and teaching capacity and outcomes, it includes understanding how the brain learns effectively, and how to optimize brain state and functioning to best support learning and teaching.

Mindfulness improves attention, emotion and self-control, it also helps knowledge, character and wisdom-based education (Tang, 2017). It is worth noting that learning becomes stronger and information retrieval becomes easier if senses are involved, also, experiences linked to emotions are easier to remember. Brain-based instructional strategies help students to practice which make information permanent. Moreover, it employs stories in teaching that engages many areas in the brain, subsequently, it engages many different emotional triggers that are helpful in retrieving

information (Sprenger, 2010). Brain-based learning is a framework that takes account of how the brain processes and interprets information, also make connections, stores and retrieve that information (Greenleaf, 2003). It offers language learners a brain-friendly way to teach (Sun, 2012). Therefore, it fosters retrieving information through the use of graphic organizers due to the premise that brains seek patterns. According to Willis (2006), patterns are passageways for memories to follow, the best way to set up the passageways is to use graphic organizers and chunking information.

Conclusion

In developing the students' vocabulary, the brain is considered to be responsible with the teacher's proper guidance and promptings. Teachers are encouraged to take a look at the brain, its parts, functions and its connection to learning. Brain-based strategies can be applied for vocabulary retention subjects trying to activate the brain and retaining information learned in class. However, there is much information to consider when discussing brain-based learning and its impact on vocabulary retention. This chapter provides the definition of brain-based learning, its principles, some brain-based vocabulary strategies and activities, and its advantages in vocabulary retention.

Chapter Three: Fieldwork

Introduction

The current chapter is devoted to the practical part of this research. It produces a detailed analysis of the collected data followed by a thorough discussion of the gathered results in an attempt to check the research hypothesis. In order to enrich this study with adequate data, a questionnaire was designed and distributed to middle school pupils since this study is concerned with the role of brain-based learning strategies in developing middle school pupils' vocabulary retention. Additionally, teachers' interview was selected as another data collection tool for this study and that in order to test the hypothesis under this study. Thus, through the findings and results obtained the hypothesis will be tested, and the questions suggested in this study will be answered.

1. Population and sampling

1.1. Population

The current study deals with middle school students and teachers in Biskra from which our sample was taken. The questionnaire and interview of both students and teachers are used for data gathering and their answers are analysed and discussed.

1.2. Sample

The sample of this study consisted of middle school pupils from different degrees (36pupils), and teachers (15 teachers) from different schools in Biskra. The first population which are pupils were chosen randomly from middle school groups on Facebook, however, the second population are teachers who were chosen randomly from different middle schools.

2. Methodology

In this study, a descriptive analytic method was followed in analysing the questionnaire and interview of middle school pupils and teachers in Biskra, to investigate the role of brain-based learning strategy in developing middle school pupils' vocabulary retention. The data gathered were measured by counting the students and teachers' answers regarding brain-based learning strategy

and vocabulary retention. Furthermore, the study of the questionnaire and interview analysis, it includes a precise and concise summary of each question mentioned in both questionnaire and interview. In addition, the statistical data of the study is introduced and illustrated in the form of tables and graphs to quantify all proceedings regarding the current study.

3. Pupils questionnaire data analysis

The major purpose behind conducting pupils' questionnaire is to gather data about the various opinions and attitudes of Middle School pupils about brain-based vocabulary strategies and its effect on their retention. The questionnaire was distributed to thirty-six pupils (36 pupils) The distribution of the questionnaire was online via Google Drive application after designing it using Google Forms application. The learners answer the questionnaire in Arabic. Furthermore, the selection of middle school pupils relies on the fact that they still beginners since most of them at early stage in learning the language, consequently they deal with English vocabulary more than the other levels. And at this stage, many learners face difficulties in the retention of English vocabulary.

3.1. Description of the questionnaire

The questionnaire contains (21) questions divided between close-ended questions, multiple choices and open-ended questions. This questionnaire is divided into four sections as follows:

3.1.1. Part One: General Information

Item 1. How long have you been learning English?

Option	Respondents	Percentage
a. Less than three years	10	28%
b. More than three years	26	72%
Total	**36**	**100%**

Table 2: pupils' year of Learning English
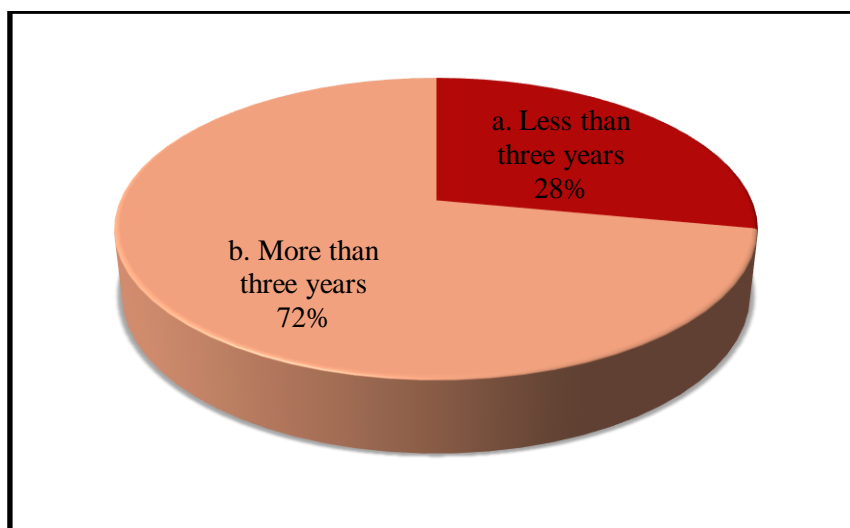
Figure 6: Pupils' Years of Learning English

This question is meant to determine the participants' dominant years of Learning English. As the table displays, that the total number is 36 pupils, the table above indicates that the majority of the pupils (26) have been studying English for more than three years (72%) whereas 10 (28%) pupils have been studying English for less than three years

Item 2. How do you find learning English?

Option	Respondents	Percentage
a. Easy to learn	26	72%
b. It is kind of hard	10	28%
c. Very difficult	0	0%
Total	**36**	**100%**

Table 3: Pupils' Opinions about Learning English
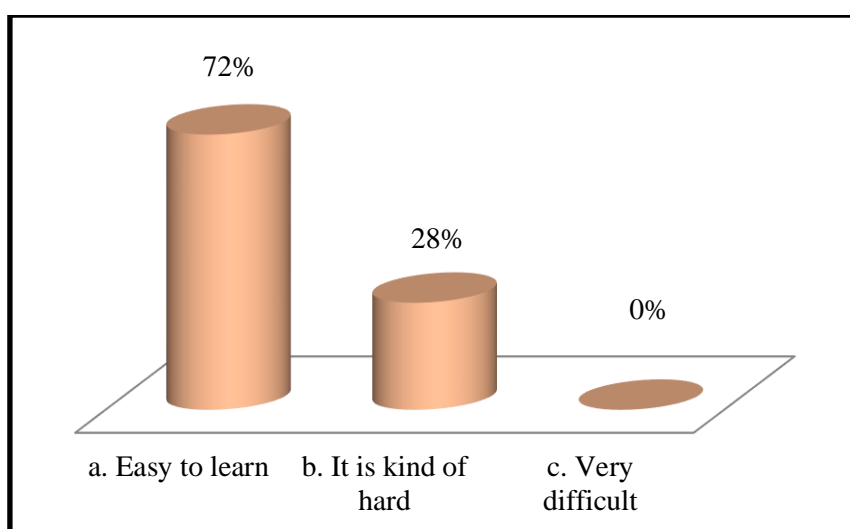
Figure 7: Pupils' Opinions about Learning English

From the table above and the figure which symbolize the attitudes of middle school students towards English language learning, it is clear that 72% of the participants find the English language easy to learn, while the answers with kind of hard were 28% which constitute 10 pupils. Their answers with easy or kind of hard were based on various reasons among them the difficulties they face when learning English. Some students have no difficulties in learning English because they love it; some others face difficulties in retaining vocabulary, speaking, spelling, and few students face difficulties in grammar, pronunciation, and the interpretation of the meaning. However, other students reported that their teachers do not use the appropriate materials of teaching.

Respondents Justifications of their Answers

When we asked participants about how they find the learning language, most of them affirmed that it an easy language to learn. To gather extra information about this question, we requested them to justify their answers. For those who answered that learning English is easy, their justifications were varied and most of them pointed that the English language is an easy language to be learned as compared to other foreign languages and because they like it. Others find it easy because of its easy grammar, simple vocabulary, and funny pronunciation. Hence, others because they resave help from their family members and the availability of electronic dictionaries. On the other hand, those who answered with "it is kind of hard" denoted that they face difficulties because they have difficulties in pronunciation, grammar, and remembering vocabulary. Other justifications denoted that the methodology used in teaching makes it somehow difficult.

3.1.2. Part Two: Vocabulary Learning

Item 3. Do you think that vocabulary is important to learn English language?

Option	Respondents	Percentage
a. Yes	36	100%
b. No	0	0%
Total	36	100%

Table 4 Pupils' Attitude towards the Importance of Learning Vocabulary
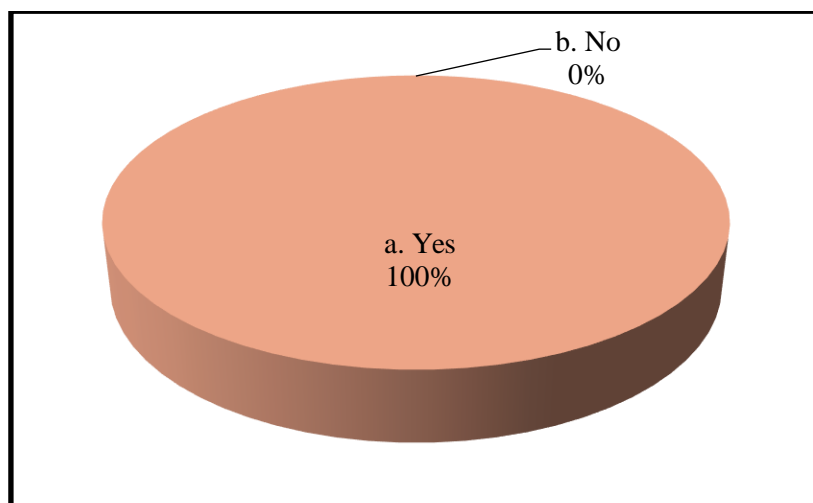
Figure 8 Pupils' Attitude towards the Importance of Learning Vocabulary

The results which are shown above indicate that, all the pupils have positive attitudes towards the importance of vocabulary in English language learning. Thirty-six students with 100% of the participants agree that vocabulary is very important to learn English language

Respondents Justifications of their Answers

To sum up respondents' justifications, pupils offered several justifications nearly the overall answers recognize the vital role of vocabulary in learning English; therefore, they can be motivated to learn it. Some of their answers were vocabulary is important, necessary, and without vocabulary, there are no meaningful sentences. Moreover, some pupils claimed that it is "the basics, essential of the language, the more vocabulary the more communication skill develop, without vocabulary the message will never be transmitted…".

Item 4. What does your teacher use to facilitate learning new words in the classroom?

Option	Respondents	Percentage
a. Educational games	**0**	**0%**
b. Pictures	**5**	**14%**
c. Audio aids	**1**	**3%**
d. Videos	**0**	**0%**
e. Gestures	**5**	**14%**
f. More than one method	**13**	**36%**
g. All of them	**12**	**33%**
Total	36	100%

Table 5 teachers' Adopted Methods to Facilitate New Words
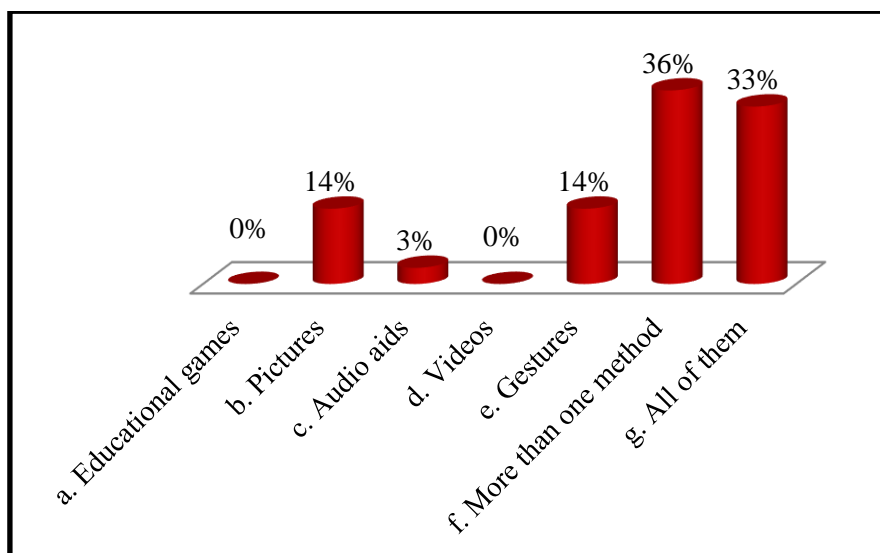
Figure 9 Teachers' Adopted Methods to Facilitate New Words

To have an idea about the methods that teachers use in the classroom to facilitate for pupils learning new words, The questionnaire included a sub-question to ask them to choose the methods. Additionally, we added another option (others) to enable students to write other methods that are not among the main options. A considerable number of students representing 36 % of the respondents have revealed that their teachers use more than one method. Besides, 33% of the respondents have clarified that their teachers use all of the mentioned methods. Moreover, 14% of respondents have reported that their teachers use only pictures. In addition, 24% of the respondents have clarified that their teachers use one method which is gestures. While only 3% of respondents have indicated that their teachers use audio aids. Lastly, some pupils chose other and stated that their teachers use drawing, role play, and using those words in discussion.

Item 5. Which of the methods mentioned above in (Q4) do you prefer the most?

This question is asked to find out students' preferences of the previously mentioned methods. As such, seven pupils prefer learning new words with Educational games and six pupils prefer videos. While four pupils prefer gestures and another four pupils prefer audio aids in learning vocabulary. Finally, one student chose pictures and four pupils choose more than one answer as they prefer more than one form, however, the rest of the students prefer not to answer this question.

Item 6. Where do you face more difficulties? (You may choose more than one answer)

Option	Respondents	Percentage
a. During learning	**1**	**3%**
b. In understanding the new vocabulary	**3**	**8%**
c. In pronouncing and writing vocabulary	**6**	**17%**
d. Recalling and using new vocabulary	**14**	**39%**
e. More than one difficulty	**12**	**33%**
Total	36	100%

Table 6: Pupils' Difficulties When Learning New Vocabularies
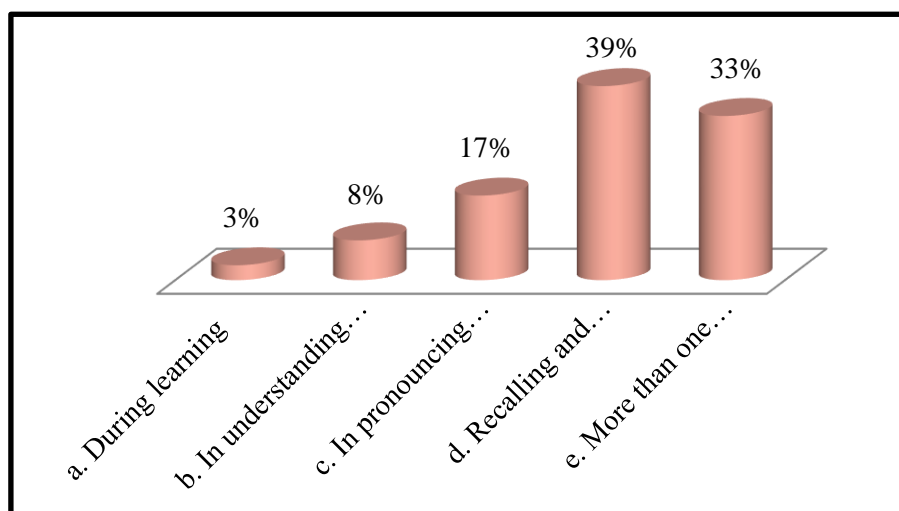
Figure 10: Pupils' Difficulties When Learning New Vocabularies

The present question intended to know where the students face more difficulties in the English language. Participants' difficulties while learning, recalling and using new vocabulary are ranked at the top with a rate of (39%) or 14 participants. Then comes pronouncing and writing vocabulary in the second place with (17%) or 6 participants and in the third place was understanding the new vocabulary with the rate of (8%). Whereas a percentage of (33%) claimed that they face more than one difficulty and the rest (3%) of participants claimed that they face difficulties during learning and other participants highlighted that there are other difficulties out of the given ones, they mentioned that they fin difficulties in retaining the new words and their right meaning and in speaking.

3.1.3. Part Three: Vocabulary Retention

Item 7. To what extent do you find retention and remembering vocabulary useful in learning the English language?

Option	Respondents	Percentage
a. **Very useful**	30	83**%**
b. **Kind of useful**	**6**	**17%**
c. **Totally useless**	**0**	**0%**
Total	36	100%

Table 7: The Usefulness of Retaining and Remembering Vocabulary in Learning the English Language
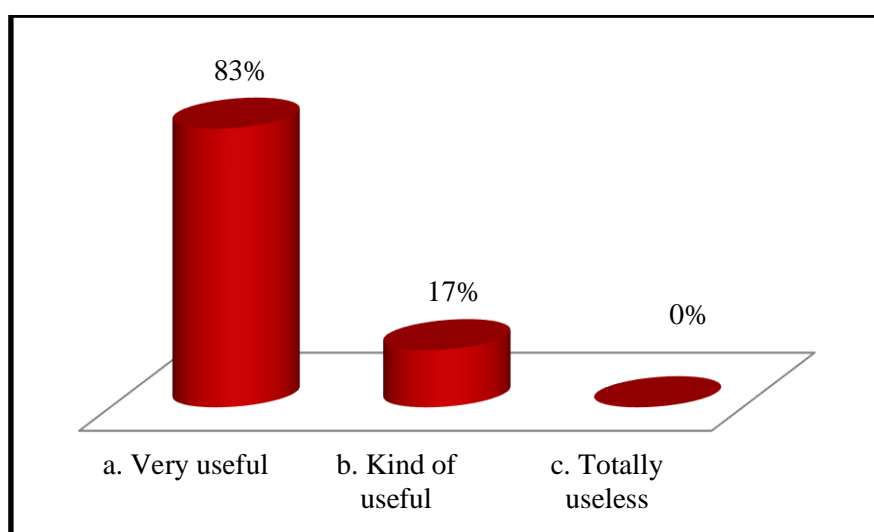
Figure 11: The Usefulness of Retaining and Remembering Vocabulary in Learning the English Language

This question sought to identify the usefulness of English language vocabulary retention and remembering in learning. The graph above indicates that the majority of respondents (83%) find it very useful. And 17% of pupils claimed that they find it kind of useful.

Respondents Justifications of their Answers

This sub-question objective is to verify pupils answers about retention and remembering vocabulary in learning the English language, most of them insisted on its usefulness. Hence, to gather extra information we requested them to justify their answers. The majority of pupils' justifications showed that Without vocabulary they cannot learn, talk, or convey a message. They added that a large vocabulary provides more opportunities to express themselves. Other

justification highlighted that rich vocabulary provide exact words, recognition of the content, appropriate word formation, and improve spelling and writing.

Item 8. How do you find retaining English vocabulary?

Option	Respondents	Percentage
a. Very difficult	2	6%
b. Difficult	23	64%
c. Easy	11	30%
d. Very easy	0	0%
Total	**36**	**100%**

Table 8: Pupils' Opinion about Retaining English Vocabulary
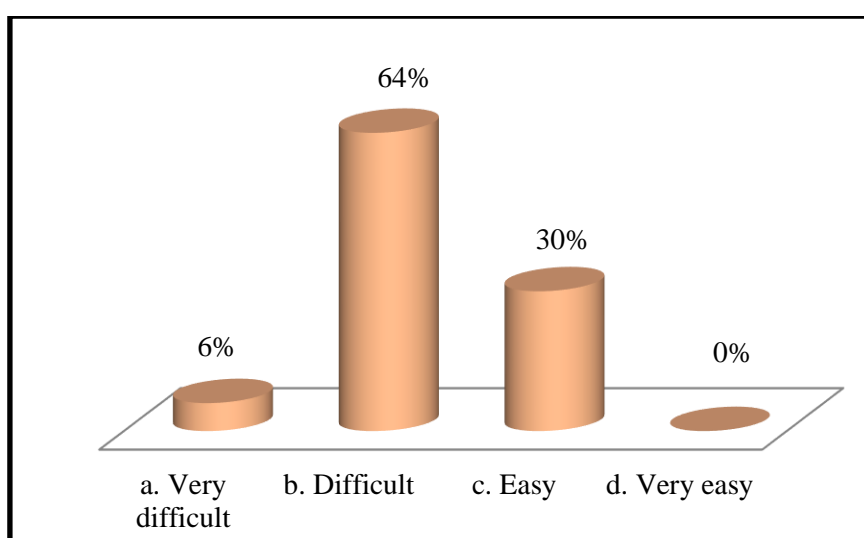
Figure 12: Pupils' Opinion about Retaining English Vocabulary

From the table and figure above, results showed that 30% of the participants which constitute eleven students find retaining English vocabulary as an easy task. While 23 of students who represent 64% of the participants answered that retaining vocabulary is difficult. Meanwhile, two students who represent 6% of the participants reported that retaining English vocabulary is a very difficult task for them.

Item 9. In your opinion, what is the most difficult aspect of retaining English Vocabulary?

Option	Respondents	Percentage
a. Spelling	9	25%
b. Pronunciation	10	28%
c. Meaning	17	47%

Total	36	100%

Table 9: The Most Difficult Aspect of Retaining English Vocabulary
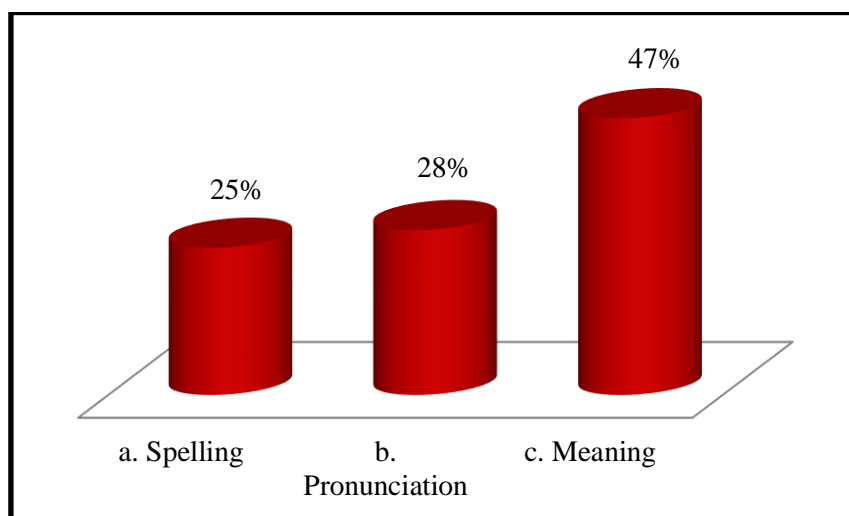
*Figure 13***:** The Most Difficult Aspect of Retaining English Vocabulary

Concerning the question of the most difficult part in English vocabulary retention is, the pupilsts' answers were different according to the data that table and figure above provide. Nine pupils who represent 25% from the participants, answer that they face difficulties in vocabulary retention because they face problems at the level of spelling words, while 10 pupils reported that they face problems at the level of pronunciation that is why they cannot retain words.17 pupilss who represent 47% of the participants claim that the most difficult aspect in retaining English vocabulary is to retain its meaning.

Then, the participants were asked to justify their answers. As for those who face problems at the level of spelling words, some said they do so because of the silent letter and others because of the words with the same pronunciation and different in writing. Thus, pupils who face problems at the level of pronunciation stated that because of phonetics and the different accents of English. Nevertheless, the majority who has agreed that meaning is the most difficult aspect claimed that it is because of the different meanings of the same word, difficulties in remembering, and others because of the teaching methods.

Item 10. What are the different strategies that your teacher use to improve your English vocabulary retention? (You may choose more than one answer)

Option	Respondents	Percentage
a. Translations	3	8%
b. Repetition of the word	7	19%
c. Using vocabulary in different sentences	4	11%
d. Definitions	2	6%
e. Drawings	0	0%
f. More than one strategy	19	53%
g. All of them	1	3%
Total	**36**	**100%**

Table 10: Teacher' s Adopted Strategies to Improve Pupils' English Vocabulary Retention
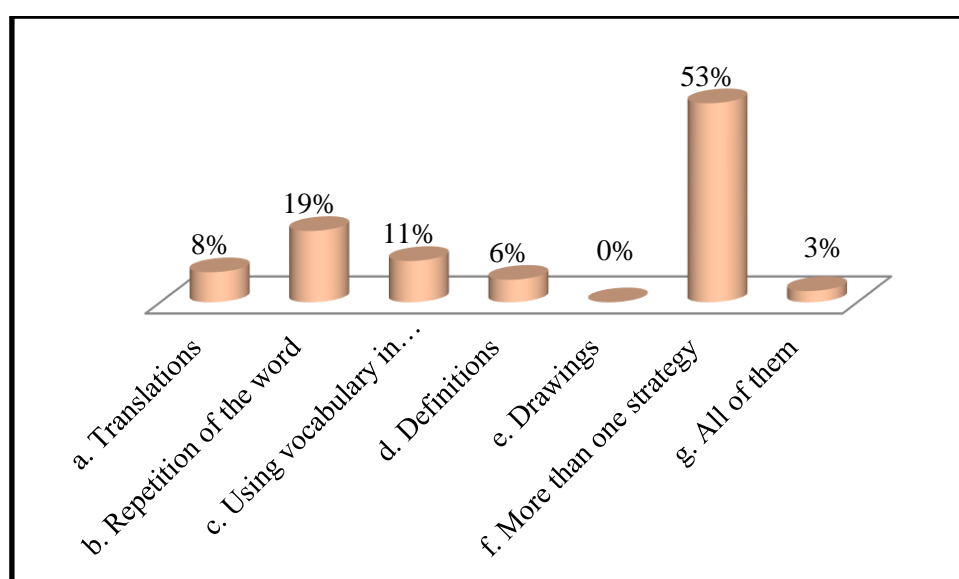
Figure 14: Teacher' s Adopted Strategies to Improve Pupils' English Vocabulary Retention

As it is clearly observed, the strategy that teachers use in order to increase their pupils' vocabulary retention. The majority of pupils (53%) highlighted that their teachers use more than one strategy. While (19%) of the pupils state that their teachers use repetition of words as a strategy to facilitate their retention. Besides, (11%) of pupils claimed that their teachers use vocabulary in different sentences, others (8%) stated that their teachers use translation. Thus, (3%) of pupils state that their teachers use definitions while only (3%) use all of the strategies. Whereas, other participant stated that their teachers use other strategies and they asserted that they use notebooks.

Item 11. In your opinion, is it necessary to use new methods for teaching English vocabulary?

Option	Respondents	Percentage
a. Yes	23	64%
b. No	13	36%
Total	**36**	**100%**

Table 11: The Necessity of Using New Methods for Teaching English Vocabulary
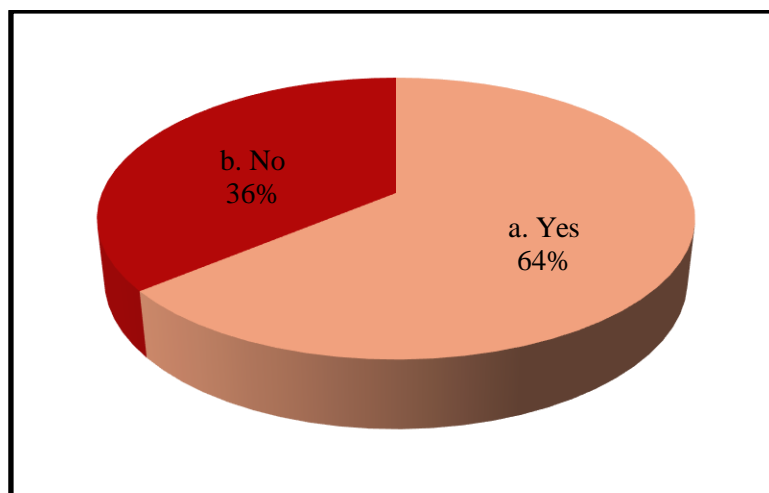
Figure 15: The Necessity of Using New Methods for Teaching English Vocabulary

As it is shown in this table, the majority of pupils who represent (64%) claim that it is necessary to use new methods for teaching English vocabulary, whereas the remaining percentage of students (36%) revealed that it is not necessary.

If the answer is "yes", what are the new methods that you think are appropriate for teaching English vocabulary?

Moreover, this sub-question seeks to identify the new methods that pupils think that are appropriate for teaching English vocabulary. Some students claimed that using technology and videos others suggested using games and fun ways others claimed that repetition, but not in the tradition boring ways. Others stated that using songs and short movies, stories, and role play.

3.1.4. Part Four: Brain-Based Strategy

Item 12. Does your teacher use audiovisual materials in the classroom to improve your vocabulary retention?

Option	Respondents	Percentage
a. Yes	24	67%

b. No	12	33%
Total	**36**	**100%**

Table 12: Teachers' Use of Audio-visual Materials in the Classroom to Improve Pupils' Vocabulary Retention
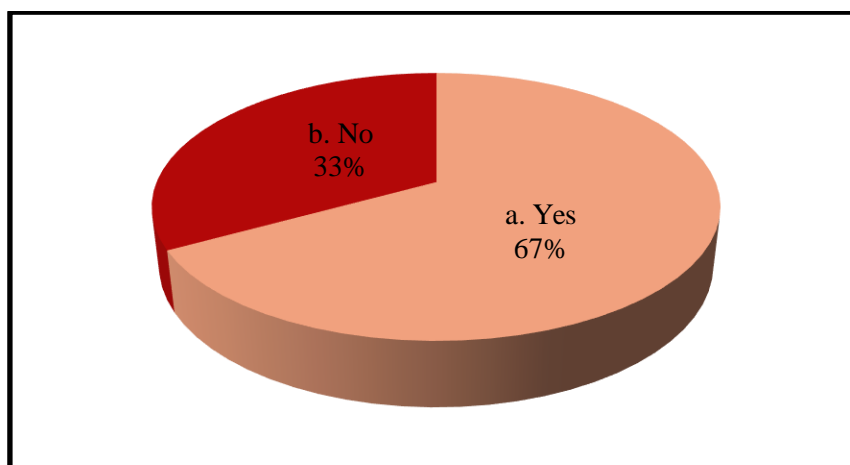
Figure 16: Teachers' Use of Audio-visual Materials in the Classroom to Improve Pupils' Vocabulary Retention

The table and figure above show pupils' answers about whether their teachers use audiovisuals in the classroom to help them develop their vocabulary retention or not. The statistics reveal that 24 (67%) state their teachers integrated audio-visual in teaching, and 12 (33%) answered with "no", this may due to the teachers' awareness about the effectiveness of audiovisual on enhancing learners' vocabulary and because it creates a motivating environment, simplifies vocabulary learning, and the students will not get bored.

If yes, what kind of audiovisual does s/he use? (You may choose more than one answer)

Option	Percentage	Percentage
a. PowerPoint	1	4%
b. Computer/ Internet	4	17%
c. Audio aids/ songs	1	4%
d. Videos	1	4%
e. More than one material	13	54%
f. All of them	4	17%
Total	**24**	**100%**

Table 13: Kind of Audio-visual Materials Teachers' Use
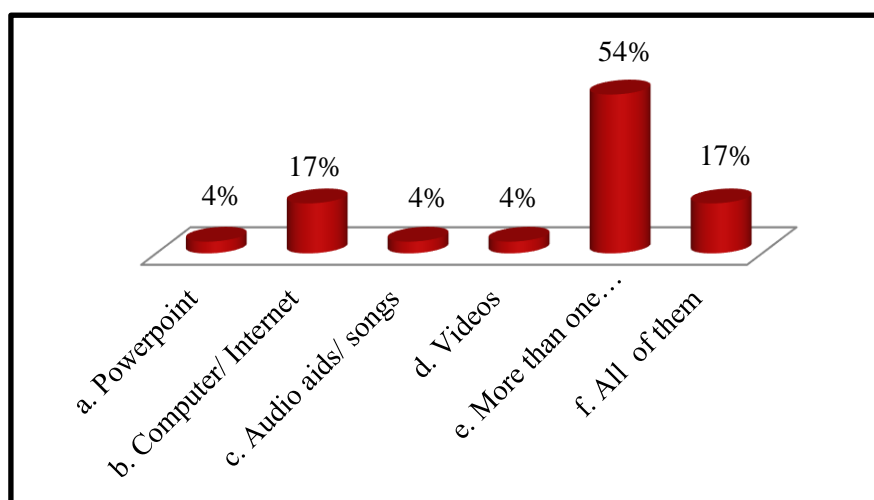
Figure 17: Kind of Audio-visual Materials Teachers' Use

In this section, both the table and figure above illustrate the answers of our participants about which types of audiovisuals are used by teachers. One pupil (4%) answered "videos", and one participant with the rate of (4%) answered audio aids/songs and one (4%) participant responded "PowerPoint". However, four participants with 17% answered computer/internet, 13 pupils with the rate of 54% answered that their teachers use more than one material and 4 pupils with rate of 17% answered that all the mentioned materials are used by their teachers in the classroom. Furthermore, we offered our participants an opportunity to give other options, few of them said "audio clips and Games".

Item 13. Does your teacher connect what you are learning to your own life or to a story?

Option	Percentage	Percentage
a. Yes	24	67%
b. No	12	33%
Total	**36**	**100%**

Table 14 Pupils' Responses about Whether their teacher connect what they learn to real life situation or to a story or not
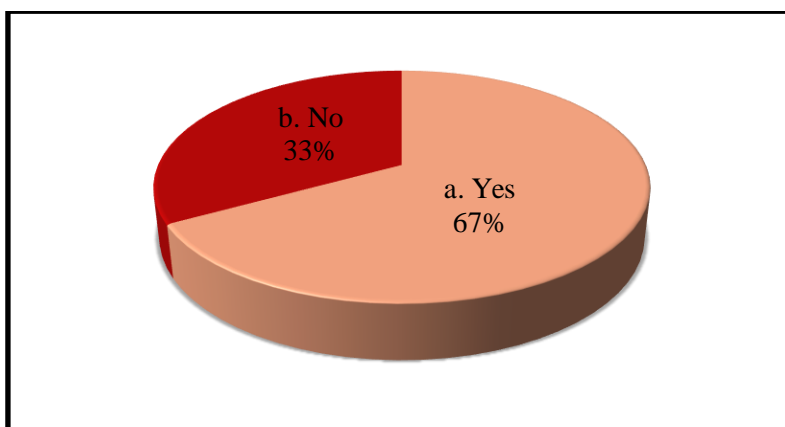
Figure 18: Pupils' Responses about Whether their teacher connect what they learn to real life situation or to a story or not

Apparently, the majority of the pupils have answered that their teachers connect what their learning to your own life or to a story. Twenty-four pupils with 67% of the participant answered that their teachers made a connection to a story or real-life situations. Whereas, twelve pupils with the rate of 33% state that their teachers do not connect it. This question aimed to know if teachers engage their pupils' attention and interest and therefor enhance their learning and retention.

Item 14. Does your teacher make you practice the words learned in classroom?

Option	Respondents	Percentage
a. Yes	26	72%
b. No	10	28%
Total	**36**	**100%**

Table 15 Pupils' Responses about Whether their teacher make them practice what they learned or not
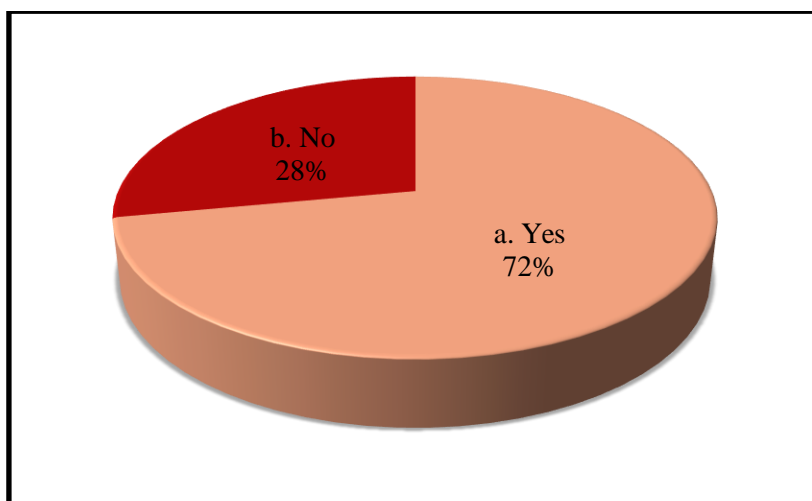
Figure 19: Pupils' Responses about Whether their teacher make them practice what they learned or not

The aim of this question is to see whether teachers engage their students and make them practice what they have learned or not. In fact, 26 students (72%) answered that they do practice the learned vocabulary, whereas 10 students (28%) said that they do not practice it.

Item 15. Do you think that using entertaining ways of teaching vocabulary will improve your vocabulary retention?

Option	Respondents	Percentage
a. Yes	36	100%
b. No	0	0
Total	**36**	**100%**

Table 16: The Use of Entertaining Ways and Vocabulary Retention Improvement
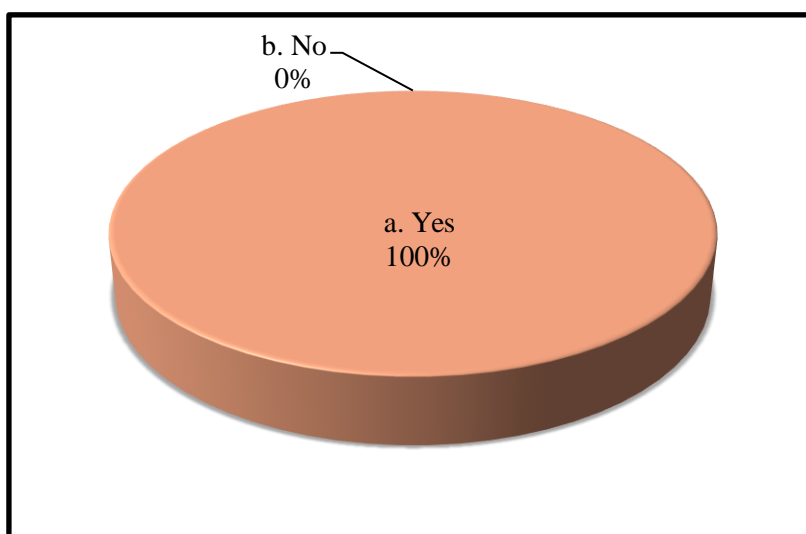
Figure 20: The Use of Entertaining Ways and Vocabulary Retention Improvement

To have an idea about pupils' opinion whether the use of entertaining methods improve their vocabulary retention and recall or not. As clearly illustrated in the table and figure above, (100%) of pupils believe that entertaining ways improve their vocabulary retention.

Respondents' Justifications of their Answers

In this question, the pupils were asked to justify their answers. The respondents listed a wide range of reasons and this provided various and valuable justifications. To start with, some pupils who did not understand the question and mention some of the games and funny ways they prefer when learning. Further, other pupils claimed that

- ❖ entertaining ways are the best ways that suits the students to learn and retain vocabulary
- ❖ Because it makes us learn in unconscious way.
- ❖ it makes student enjoy and love the language.
- ❖ It motivates pupils to learn the language quickly and not to forget it.
- ❖ When Learning is linked to entertainment, vocabulary will last in mind for long time.
- ❖ The student naturally tends to learn in entertaining ways because of its ease and simplicity.
- ❖ Because everything funny stays in mind.
- ❖ Current students prefer to enjoy more than sitting consequently entertaining and education is the best combination?
- ❖ Because it helps them retain and remember in easy way without memorization.
- ❖ Because entertaining ways help us remember vocabulary
- ❖ Fun and entertainment ways help to remember vocabulary easily

Item 16. List any word/ss you remember learning in the class and why you remember it?

To have an idea about how pupils retain best and recall what they learned when needed, we asked them to list words they remember and why. To illustrate the learners' justification here are their statements:

❖ I remember the word wallet When I asked the teacher to explain the meaning of the word, she gave me her wallet and told me this is the meaning of the word.

❖ I remember when the teacher told us that the word "judge" in English was pronounced like the word "glass" in the Amazigh language since that time I did not forget it.

❖ "go out" because I get expelled too much

❖ "fast food" because it means eating

❖ "Ring, queen, king, river, party, sord, war" I remember these words because we did a play in the classroom.

❖ I remember "meat" because I ask my teacher what it means

❖ Good morning because we always greet the teacher before entering the classroom

❖ "Oil" I remember it because the teacher said it in one of the games

❖ "Funny" because we use a lot

❖ "Thanks, dad, mom, good night" because we use these words in our daily life

❖ "listen here, did you understand" that's because they are the most repeated words in the class

❖ Scarf because I wanted to know what does mean, and the teacher take off her scarf and gave it to me and told me this is a scarf.

❖ "Garlic" I remember it because of its use in daily life

❖ "Irregular verbs: Break broke broken Speak spoke spoken" because we repeat it every session in songs using these verbs.

❖ "Shoulder" because we used it in one of a play

❖ "Tooth" because I used to mix it up with "touch" until my colleague corrected it for me

❖ "Dream" because I love my dream and I want to reach it

The other pupils did not justify their answers, they mention only the words they remember.

Item 17. How long do you often retain vocabulary you have learned before forgetting it?

Option	Percentage	Percentage
a. Few hours	8	22%
b. Few days	8	22%
c. Few weeks	9	25%
d. Few months	11	31%
Total	**36**	**100%**

Table 17: The Duration of Pupils Retention of the Learned Vocabulary
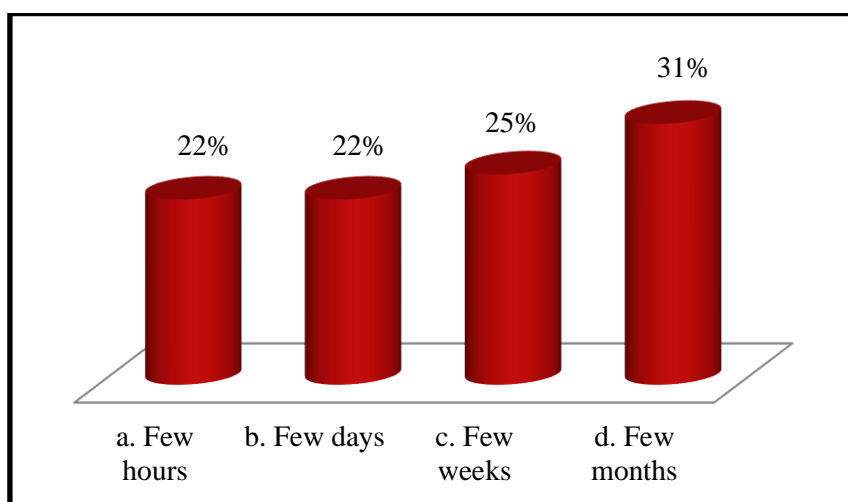
Figure 21: The Duration of Pupils Retention of the Learned Vocabulary

We attempt through including this question to know how long pupils retain what they have learned as vocabulary before forgetting occurs. This question had different options that represented different periods of time ranging from a few hours to a few months. About 22 % of the pupils have revealed that they retain what they learned as knowledge for a few days. However, 31 % of the pupils have said that they can do that for a few months. Some pupils who represented 25 % of the pupils have reported that they retain vocabulary for weeks. Moreover, 22 % of the pupils have answered that they keep what they learned as a vocabulary for only a few hours.

Item 18. In your opinion, what are the most important factors that help you to learn, understand, retain and remember new vocabulary?

Option	Percentage	Percentage
a. Pupils interests in learning the language	2	6%
b. Teacher competence	1	3%
c. Means of education	1	3%

d. Methods of teaching	0	0%
e. The means of education and the methods of teaching are compatible with pupil's way of learning	2	6%
f. More than one factor	18	50%
g. All of them	12	32%
Total	**36**	**100%**

Table 18: The most Important Factors that Help Pupils to grasp New Vocabulary
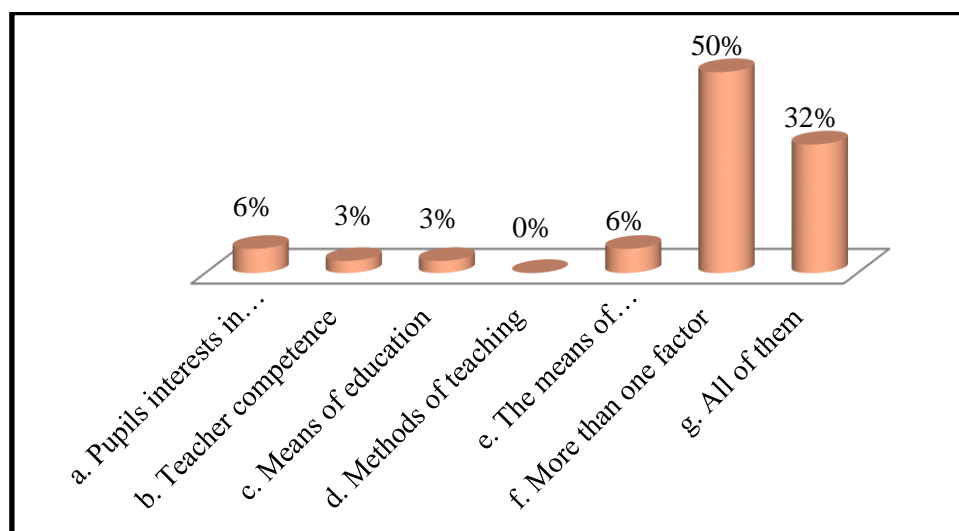
Figure 22: The most Important Factors that Help Pupils to grasp New Vocabulary

For the sake of identifying the important factors that help pupils to learn, understand, retain and remember new vocabulary, we asked the pupils to choose the factor(s) that help them in their views. In addition, we added another option (others) to enable the participants to write down other factors that have not been mentioned among the main options. The majority (32 %) of the participants have agreed that a combination of all the factors options together effect and help their learning, understanding, retaining and remembering new vocabulary. However, (6%) of the pupils expressed that Pupils interests in learning the language are the most important factor that helps them. In addition, (6%) of the respondents have clarified that the means of education and the methods of teaching are compatible with pupil's way of learning is the most important factor. Besides, (3%) of the respondents have reported that teacher competence is the factors that help them most. Some students who represented (3%) of the respondents have reported that the factor that helps them most is a means of education. Moreover, the highest percentage of (50%) of the respondents agreed that more than one factor helps them to learn and retain vocabulary.

Furthermore, some students have added other factors of recalling information, they add the classroom environment and motivation as a factor.

Item 19. To what extent do you think the use of brain-based strategies and activities is necessary to learn new vocabulary?

Option	Percentage	Percentage
a. Very important	27	75%
b. Somehow important	9	25%
c. Not important at all	0	0%
Total	**36**	**100%**

Table 19: The Importance of Using Brain-Based Strategies to Learn New Vocabulary
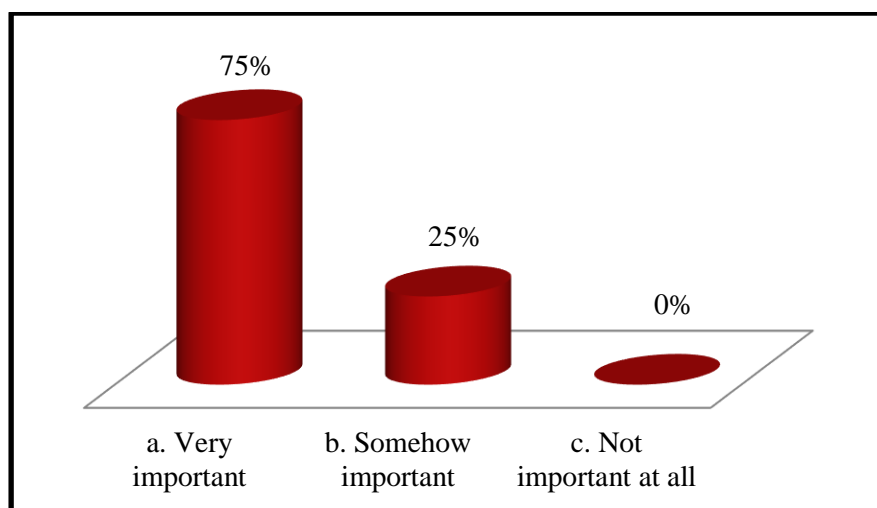
Figure 23: The Importance of Using Brain-Based Strategies to Learn New Vocabulary

According to the results above, most of the pupils asserted the importance of brain-based strategies and activities in teaching and learning new vocabulary. As it is illustrated in the figure above learners with percentage of (75 %) said that brain-based strategies and activities are very important and useful to learn new vocabulary. While the other pupils (25%) answered that it is somehow important.

Respondents' Justifications of their Answers

Nevertheless, to gather extra information about this question a sub-question was added to request pupils to justify their answers. Some pupils did not justify their choices because they are

not interested in it, or they did not understand it. To sum up respondents' justifications, those who
answered with the great importance of brain-based strategies and activities in vocabulary learning
offered several justifications. To mention some:

Options	Students justifications
Very impotent	- The brain likes to learn in an entertaining way - It helps to retain new vocabulary in the long-term memory - Because it makes remembering vocabulary easier - Because the use of brain activities keep vocabulary in mind - attract the pupil's attention - it facilitates the learning and retention of vocabulary - Because motivational activities help the mind to learn and retain well - It is different than the traditional methods - Because it is the way that students nowadays can gain through it more information - It is faster in learning - Motivation is very important, it helps learn and eliminates forgetting - If the brain is motivated the vocabulary lasts for a longer time - The more we like the method of the learning the more we like the language - Because it facilitates the learning of vocabulary
Somehow important	- To remember the vocabulary easily - Songs are entertaining and interesting - Found it important

	– it may benefit pupils as it may not

Item 20. Among the following activities, what activities does your teacher use more in the classroom to motivate you to retain more retrieve the English vocabulary? (You can choose more than one answer)

Option	Percentage	Percentage
a. Spelling games and crossword puzzles	3	8%
b. Linking vocabulary to its images or meanings	7	19%
c. Use of gestures	0	0%
d. Fill in the blanks with the right words	4	12%
e. Drawing	0	0%
f. More than one activity	19	53%
g. All of them	3	8%
Total	**36**	**100**

Table 20: Teacher's Adopted Activities to Motivate Pupils to Retain the English Vocabulary
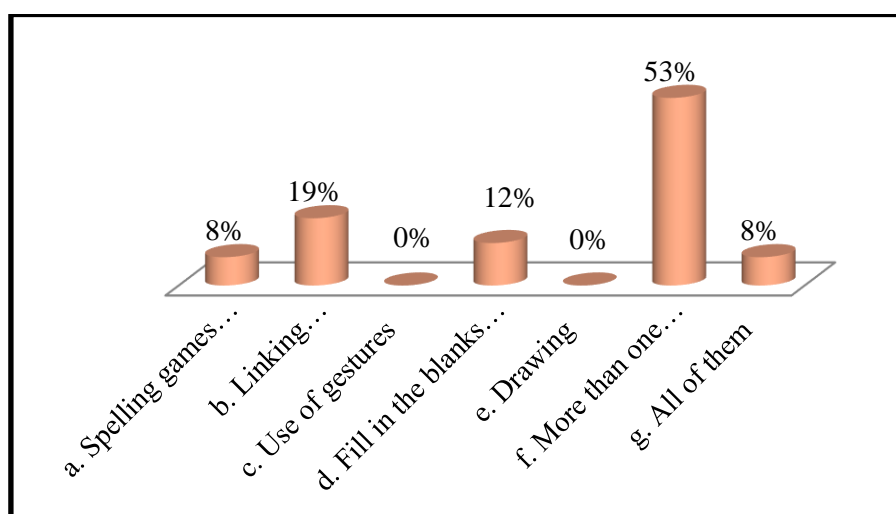
Figure 24: Teacher's Adopted Activities to Motivate Pupils to Retain the English Vocabulary

To have an idea about the mental activities that teachers focus more on, to motivate their pupils to retain more the English vocabulary. We asked pupils to choose the activities their teachers apply. A percentage of (19%) of pupils said that their teachers link the vocabulary to its images or meanings. While (12%) of the pupils claimed that their teachers use fill in the blanks with the right word activities. Besides, some pupils with the percentage a (8%) asserted that spelling games and crossword puzzles are used by their teachers. However, (8%) of the participants said that their

teachers use all the mentioned activities. In addition, (53%) of pupils affirmed that their teachers use more than one activity.

Item 21. How does your teacher assess your vocabulary retention?

Since assessment is a part of learning and it is a crucial aspect that helps in retaining and help to find out the weaknesses that need to be treated. In this question, we aimed to discover the way teachers assess their students' vocabulary. Furthermore, most of the pupils claimed that their teachers assess them through a test or exam only. Others state that they are assessed through an exercise in which the vocabulary is used, or their teachers provide them with words and they give its meaning. Some students claimed that they are tested through dialogues using the words they have learned it, or teachers ask them about the vocabulary at the begging of each session. Besides to brain games that include the vocabulary, others through pictures and they guess the words. Hence, some pupils add that their teachers encourage them and reward them others said that their teachers threaten them with points when they are assessed.

4. Analysis of the Teachers' Interview

4.1. Description of the Interview

This interview is designed for middle school teachers in Biskra. The interview is administered to Fifteen (15) teachers who were chosen randomly. The survey was administered electronically through middle school teachers' group on Facebook, through an online survey administering "Google Drive" application after designing it using Google Forms application, which allows researchers to develop and administer web-based surveys to targeted samples. teachers show their collaboration through their answers, comments, and suggestions. We opted for a semi-structured interview which consists of sixteen (16) questions (close-ended questions) for short and specific answers, and (open-ended questions) for more clarifications and explanations. The purpose behind the use of this interview as one of major data gathering tool is to collect much information for a deeper understanding about the teachers' viewpoints towards the role of brain-based learning

strategies in developing middle school pupils' vocabulary retention, Besides, to collect information about their attitudes concerning techniques of teaching vocabulary and the main reasons that prevent learners to recall words and use them.

Item 1. How long have you been teaching English**?**

Option	Respondents	Percentage
a. 1-5 years	6	40%
b. 5-10 years	4	27%
c. More than 10 years	5	33%
Total	15	100%

Table 21: Teachers' Experience in Teaching English Language

The question sought to have an idea about how long teachers have been teaching English by giving them choices (1-5 years, 5-10 years, or more than 10 years) to know teachers experience in teaching English. As the table above illustrates the teachers' answers which indicate that teachers' careers are different. Four (4) teachers teach English from five to ten years; whereas, five (5) teachers teach English for more than ten (10) years. while the rest six (6) teachers teach English from 1-5 years.

since most of them have experience, they can provide beneficial responses for our study concerning teaching vocabulary in the middle school and guarantees that the next responses will be gathered from teachers with different experiences in teaching English.

Item 2. What degree do you have?

Option	Respondents	Percentage
a. **License**	8	53%
b. **Master**	7	47%
c. **Magister**	0	0%
d. **Doctorate**	0	0%
Total	**15**	**100%**

Table 22: Teachers' Degree

From teachers' responses, it is observed that the majority of teachers 53% (8 teachers) have the license degree, while (47%) seven teachers have master degree. However, none of the teachers has

a magister or doctorate degree. This is beneficial for us; for the reason, that it helps us to collect data from teachers with different degrees and experiences.

Item 3. Do you think teaching vocabulary is important for learning the English language?

Option	Respondents	Percentage
a. Yes	14	93%
b. No	1	7%
Total	15	100%

Table 23: The Importance of Vocabulary Teaching for English Language Learning

All teachers reported that vocabulary plays a significant role in learning English but one teacher. Hence, for more, information we asked them to justify their answers

- It's the basis and the core of any language

- Yes, I do. Because teaching a language means teaching to communicate and to communicate, we use words, i.e., vocabulary or lexis.

- One cannot express anything without vocabulary storage and developing this storage through time is a necessity because after a certain period the basic simple vocabulary becomes insufficient

- To learn the English language, we need to use a lot of vocabulary to deliver the information to the listeners

- Without vocabulary, the mind is empty and chances to understand any piece of writing nor even understand when listening

- Yes, I think that it's very important to learn English because without knowing the meaning of words and expressions student won't be able to understand or use them.

- Vocab leads to be more fluent

- No, language can be acquired without it's vocabulary... Its like when you're cooking ...you need vegetables

- We use vocabulary in every session whether new vocabulary or prerequisites. We often present the vocabulary in the form of flashcards, pictures, a real object, videos ...etc

- Without sufficient amount of vocabulary, pupils can't communicate.

- The teacher must have a rich knowledge to answer learners needs Know more words and use it while studying

The teacher who answered vocabulary is not important in learning threaten the English language justify his/her answer that vocabulary can be acquired naturally without direct intended teaching. Hence, almost teachers confirmed the importance of teaching vocabulary and mentioned different reasons to confirm its role in learning the English language.

Item 4. Do you present vocabulary in every lesson?

Option	Respondents	Percentage
a. Yes	15	100%
b. No	0	0%
Total	**15**	**100%**

Table 24: Teachers' Presentation of Vocabulary in every Lesson

All teachers respond positively to this question and that they introduce new vocabulary in each session due to the teachers' awareness about the importance of vocabulary in enhancing pupils' Language learning.

Teachers justifications

- introduce new vocabulary related to the topic being dealt with.

- To pave the way for learners' acquisition.

- To extend student's vocabulary knowledge and use

- Obviously, any learner has a notebook to write the new words and that's why we should present it to them.

- To facilitate the lesson since they are the key to comprehension

- The purpose is to enrich student's vocabulary so that they can produce correct oral and written English language.

- To be used by learners within the lesson or at the end of the sequence

- Familiarise

- Explanation, Illustration, And eliciting

- For many purposes, such as: to present a rule in grammar, say, prepositions, I must give my learners a set of vocabulary like a house, a table, a cat, a box, a tree a bird etc. I stick them on the board as flashcards then a present preposition like (cat inside the house/ outside the house). This is for grammar. For the pronunciation of some sounds, I use some vocabulary too. Check the coursebook you will get or information

- Presenting new vocabularies before starting any lesson, helps students to get familiar with those vocabularies and don't face difficulties to understand and use them effectively.

- To facilitate the topic and to make the understanding easier

- Enrich the pupils' minds

Item 5: What are the main strategies that you use to teach/ introduce vocabulary? (You may choose more than one answer)

Option	Respondents	Percentage
a. Educational games	0	0%
b. Pictures	0	0%
c. Engage students in learning	0	0%
d. Videos	0	0%
e. Gestures/ body language	0	0%

f. More than one strategy	8	53%
g. All of them	7	47%
Total	**15**	**100%**

Table 25 Teachers' Main Strategies used to Teach Vocabulary

In this question, teachers were asked to identify what strategy they use to introduce or teach vocabulary. The majority of teachers (53%) have indicated that they use more than one strategy, while the rest teachers which represent 47% indicated that they use all the mentioned strategies. Hence, in trying to discover other strategies that the teacher uses in teaching vocabulary we ask them an open-ended question, the majority of teachers add other strategies in order to memorize words by using

- Songs and simple shorts stories.

- Flashcards.

- To get their attention

- Songs

- Songs,games ..

- Storytelling

- Using slates (so important). Audio-visuals, books, activities, role-playing, ...etc

- Realia sometimes it is not easy to explain some words through pictures and gestures so teachers here tend to bring the thing/object he wants to introduce e.g. bringing coriander instead of spending the whole session explaining it Use the mother tongue: to explain the meaning of feelings/ diseases ... Etc since it is not easy to explain them with words/pictures/realia Using mime games : a body language tool. It is similar to gestures

- Interaction activities

- Jigsaw. Games

As it is noticed teachers use different strategies to enhance their students' vocabulary level and facilitate the language learning.

Item 6. How do you evaluate your pupils' vocabulary size?

Option	Respondents	Percentage
a. Very good	0	0%
b. Medium	9	60%
c. Poor	6	40%
Total	15	100%

Table 26: Teachers' Evaluation of Their Pupils' Vocabulary Size

According to teachers' responses, we can clearly notice that the majority (60%) of the respondents classify their student's level as being medium. While 40% of them evaluate their students as being having a poor level, and no one state that they are very good.

Item 7. What are the main difficulties that your students face when learning English vocabulary?

Option	Respondents	Percentage
a. In understanding the new words	2	13%
b. In pronouncing and writing the acquired words	3	20%
c. In retaining the acquired words	2	13%
d. Recalling and using new words	8	54%
Total	15	100%

Table 27: The Main Difficulties Pupils Face When Learning English Vocabulary

The results show that 8 teachers with a percentage of (54%) state that learners have difficulties with recalling and using new vocabulary. While three teachers with the rate of (20%) answered that their pupils face difficulties in pronunciation and writing the acquired words. One of the reasons behind these difficulties is their unfamiliarity with the language. In addition, two teachers said their pupils have a difficulty in understanding new words and other two teachers with a percentage of (13%) claimed that their students have a problem in recalling and using new words.

In addition to the mentioned difficulties, some teacher added other problems that their students face when learning vocabulary.

- Mixing up between terms and memorising them.

- Using the new vocabulary in reallife situations.

- Not all of them are able to memorize new words

- Students face the difficulty of recalling and using new words.

- They don't know how to use in context even if we don't teach vocabulary in isolation

- Learners' abilities differ from one another, that's why you find all the four mentioned obstacles and many others.

These results strengthen the view that the low level of vocabulary that pupils have is a result of the vocabulary retention difficulties or problem related to retention that they encounter.

Item 8. According to you, what are the main factors that affect the students' learning, retaining, and recalling of new vocabulary? (You may choose more than one answer)

Option	Respondents	Percentage
a. Pupils interests in learning the language	4	27%
b. Teachers' competence	1	6%
c. The use of appropriate teaching approaches and methods	0	0%
d. The use of appropriate teaching materials	0	0%
e. The compatibility of the teaching methods and the instructional teaching materials with pupil's way of learning	0	0%
f. More than one factor	4	27%
g. All of them	6	40%
Total	15	100%

Table 28 Factors that Affect the Students' Learning, Retaining, and Recalling of New Vocabulary

As the above table reveals, six teachers with a percentage of 40% think that the factors that greatly affect the pupils' vocabulary learning, retention, recalling of new vocabulary are mainly all the mentioned factors. Hence, four teachers with the rate of 27% reported that pupils' interests in learning the language are the main factor, and only one teacher said that teachers' competence is the main factor that affects the students' learning, retaining, and recalling of new vocabulary. While four teachers with a percentage of 27% assumed that a combination of the mentioned factors

effect on pupils' vocabulary learning and retention. Besides that, some teachers mentioned other factures that affect pupils' vocabulary as follows

- Also, practice is an important strategy.

- Large classes. Time restrictions, boredom, tiredness, too many lessons, noisy classes, shyness, ...etc

Item 9. How do you consider the role of vocabulary retention in the language learning process?

Teacher	Response
T1.	Memorizing a wide range of lexis is a crucial and a basic process in speaking and learning a language in general.
T2.	Vocabulary retention is very important in the language learning process since retaining lexis means being able to produce oral and written messages so learners would be able to communicate and this the core aim of teaching a language.
T3.	Significant
T4.	It's necessary to have a background
T5.	So important to understand reading or listening and even useful in writing
T6.	Vocabulary is the heart of the language. Therefore, pupils must learn new vocabulary as much as they can and try to retain them so they can learn the language.
T7.	If you don't get enough vocab, you can't vary your sentences or topics you'll write or talk about
T8.	It's is a needed core element to form simple basic meaning
T9.	It is the key to success
T10.	Very important since language is accumulative, you accumulate what you learn today on what you have learned before. And vocabulary retention can only be achieved through repetition and reading a lot about specific topics.
T11.	A crucial one
T12.	It's the basis of knowledge it helps in oral and written expression
T13.	Th pupils use it when they answer and when they speak in the class situation
T14.	Memorizing a wide range of lexis is a crucial and a basic process in speaking and learning a language in general.
T15.	Vocabulary retention is very important in the language learning process since retaining lexis means being able to produce oral and written messages so learners would be able to communicate and this the core aim of teaching a language.

Table 29: Teachers' consideration of the role of vocabulary retention in the language learning process

The table indicates that (100%) all teachers agreed about the importance of vocabulary retention in learning. Likewise they agreed that it has a vital role in Learning English, and learning depends more on vocabulary.

Item 10. According to you, what may help pupils retain new words?

Option	Respondents	Percentage
a. The use of different teaching materials	7	47%
b. The knowledge about how the brain acquires, memorize, retain and recall the words	2	13%
c. The use of entertaining strategies to teach new vocabulary	2	13%
d. The use of brain-based activities to teach new vocabulary	4	27%
Total	15	100%

Table 30: Strategies That May Help Pupils Retain New Words

In this question, teachers are asked to specify the strategies that may help pupils retain new words. As it is apparent in Table above teachers provide multiple answers. Seven teachers (47%) state that the use of different teaching materials, four teachers (27%) says the use of brain-based activities to teach new vocabulary, while two teachers (13%) says the use of entertaining strategies to teach new vocabulary. Finally, two teachers (13%) states that the knowledge about how the brain acquires, memorize, retain and recall the words. However, we asked teachers to justify their answers, various answers are obtained and each teacher provides a different explanation.

Teachers' Justifications

a) **For "The use of different teaching materials"**

• Learners can memorize better from listening, videos and pictures are so important to keep new vocabulary

• Every learner uses a specific individual learning strategy according to their mental capacities and style of learning like visual, aural, ...

• Repetition helps learners acquire and memorize the new lexis and we can do that by practicing a different type of activities

• People learn via using their different senses and since they are different learners, some learn through seeing, others through touching, others through listening.... etc. that's why using different teaching materials is so important for all learners to grasp vocabulary and learn each one at his/ her pace and way. The other techniques you mentioned are also important especially c and d.

b)   For "The knowledge about how the brain acquires, memorize, retain and recall the words"

• Language learning depends on the brain. Knowing how the brain learns helps students to use the appropriate strategies.

• They will have a dictionary in their brain

c)   For "The use of entertaining strategies to teach new vocabulary"

• For me this is the best way to make them retain new words because it is an active way for the brain

• Students are highly attracted by fun and games

• Especially the young learners they can learn easily from games and playing

• When learners have fun, they retain not just words but full sentences, songs ...

d)   For "The use of brain-based activities to teach new vocabulary"

• The vocabulary tasks provided in the coursebook are mainly based on memorizing and repeating new words to acquire them there is no place for training our students how to grasp the

meaning from a context or how we can use new words in different contexts rather than the one provided in the coursebook. Thus, their vocabulary will be limited but if we manage their minds and ways of thinking in a different way, they will be able to be more active and able to activate their vocabulary learning and processing by turn

•   Using brain-based activities is very useful for vocabulary retention because it provides different vocabulary activities for pupils who have different abilities and interests, so it encourages them to retain new lexis

We noticed from the respondents' answers that teachers have a positive attitude toward brain-based activities to enhance their students' vocabulary retention which indicates that the majority of teachers opt for brain-based teaching strategies to develop their students' vocabulary. In the same path, this new strategy to teach English vocabulary especially once it helps them to promote their students' vocabulary retention, knowledge and use. need to be integrated with the classroom especially during the presentation of new items for the purpose of facilitating the language learning; as well.

One teacher justifies his/her answer that the question is ambiguous and not clear.

Item 11. How do you help your pupils to overtake vocabulary retention difficulties?

This question is to demonstrate how teachers help their learners overtake vocabulary retention difficulties.

Teacher	Response
T1.	Use of language games and assigning catch up sessions with simple practical tasks.
T2.	By using brain-based activities.
T3.	I actually like to use ICT tools in my class. Always devote a place on the blackboard where can explain the new words through drawing and I try to change the instructions of the task so that my students can perform it as a game
T4.	To bring with them a notebook
T5.	Through the four skills

T6.	I help my students to overtake vocabulary retention difficulties by using a practice such as: making them produce sentences, filling gaps.... etc.
T7.	Making puzzles, crosswords ...to help them recall the new vocab and its definition
T8.	Getting them to be more involved
T9.	Brainstorming presents the new lexis multiple time in different sessions
T10.	Via warming-up phase for 5 to 10 minutes at the beginning of each session. Via repetition, entertainment. Slate, ...etc
T11.	Recalling, encouraging using vocabularies in different situations and contexts through games (crosswords, hang a man…), techniques (spider map)
T12.	They must use them in communication and in their paragraphs
T13.	Understand the meaning through the context
T14.	Use of language games and assigning catch up sessions with simple practical tasks.
T15.	By using brain-based activities.

Table 31: Teachers' Techniques to Help Their Pupils Overtake Vocabulary Retention Difficulties

Most of the teachers have mentioned different strategies and multiple activities that they use to overtake vocabulary retention difficulties, that their students encounter in learning new vocabulary or words rather than only one strategy. Which is a good indication to help student and support them for better retention.

Item 12. Would you be more willing to initiate brain-based learning if you knew more about it?

Option	Respondents	Percentage
a. Yes	14	93%
b. No	1	7%
Total	15	100%

Table 32: Teachers' Willingness to Initiate Brain-based Learning

In This question, the teachers were asked if they would be more willing to initiate brain-based learning if they knew more about it, over 93% of teachers claimed they are willing to use it. While only 7% of teachers claimed they would not.

Item 13. If you know that Brain-Based Learning is "Providing for differences in learning through encouraging students to learn with music, mind maps, role play, journals, model building, movement, community projects, theatre, art, etc." (Jnsen, 2000), to what extent do you think it can be useful for increasing vocabulary retention? Justify your answer, please.

Teacher	Response
T1.	In my opinion, all these may help learners in vocabulary retention since everyone has his learning style.
T2.	The different activities which are provided attract the pupils' attention and encourage them to memorize as much lexis as they can and retain them to be used when needed.
T3.	Very useful, because we are dealing with a new generation of students, the generation of technology. Therefore, the most important aim than giving information to the student is to keep him interested in the lesson or the material. Therefore, engaging students in multiple activities and changing the learning environment from one that is linked only to a textbook to a fun environment that requires actions will greatly and positively affect Their vocabulary learning
T4.	All of them, because we need to use all kind of vocabularies
T5.	Learners would find it funny and so enjoyable to learn English
T6.	It is very useful because students entertain and learn at the same time.
T7.	It can be really helpful if we teach learners through other things than a hostile book and copybook.
T8.	Not very much and definitely it's not going to work for everyone.
T9.	It can be helpful only if English is given importance in middle school
T10.	To be honest, I apply this kind of activities in TD sessions only, it means once in two weeks for each group because in a normal session in a class of 38 to 45 pupils it is impossible to do one activity and check all learners whether they understand better or not.

T11.	**If BBL definition refers to all that, it really increases, boosts, fosters, enhances and improves vocabulary retention since it is a mixture of different techniques and strategies that motives the brain as well as the learner starting from memorizing till retrieving and using the new acquired vocabs. The diversity of these techniques helps all the pupils whatever their level/needs/ differences to acquire and understand the new vocabulary and reach the main objective which is to put this vocab in use effectively and appropriately.**
T12.	**Of course, it helps a lot because it's varied which can fit the different learners' personalities**
T13.	**Yes. It is useful because it has different methods. It is interesting**
T14.	**The different activities which are provided attract the pupils' attention and encourage them to memorize as much lexis as they can and retain them to be used when needed.**

Table 33: Teachers' opinions about the degree of usefulness of BBL for Increasing Vocabulary Retention

This question aims to know the teachers' opinion/attitude toward brain-based strategy and how they find it to increase their students' vocabulary retention. Hence, most of the teachers have years of experience in teaching English. In addition, they agreed that most of students have the problems of vocabulary retention; as a result, those teachers are capable to determine the usefulness of brain-based learning for increasing vocabulary retention as a teaching strategy to overcome the problem of students' vocabulary retention. This result confirms that teachers believed brain-based learning is a very positive way to learn and can help students learn new vocabulary and give them the opportunity to solve the problem of forgetting words and retention.

Item 14. According to you, which of the following brain-based activities can be useful for new vocabulary retention? (You may choose more than one answer).

Option	Respondents	Percentage

a. Students' drawings	0	0%
b. Visual organizers (mind-maps...)	0	0%
c. Crosswords	0	0%
d. Matching words of their meanings or pictures	0	0%
e. Physical actions (Demonstrations)	0	0%
f. Fill in the gaps' activities	0	0%
g. More than one activity	4	27%
h. All of them	11	73%
Total	15	100%

Table 34: Brain-based Activities That Can Be Useful for Vocabulary Retention

This question attempt to view teachers' beliefs about the usefulness of brain-based learning activities in learning new vocabulary and retention. The table above clearly indicates that (73%) of the teachers think that all the brain-based activities mentioned above can be useful for new vocabulary retention. Yet, (27%) of the teachers state a combination of the mentioned activities.

However, three teachers add other options

- Conversations

- Others like listening to spoken English and watching videos.

- Mime games, spider map, hang a man, synonyms/opposites/ definitions, realia

Item 15. To what extent do you agree or disagree with the following statements?

Statements	Strongly Agree		Agree		Neuter		Disagree		Strongly Disagree	
a. I have a sufficient understanding of how the brain learns	0	0%	11	74%	2	13%	2	13	0	0%
b. It is important to practice various learning strategies in my classroom	0	0%	1	7%	1	7%	5	33%	8	53%
c. I feel that how one learns, plays, an important role in classroom learning	8	53%	4	27%	3	20%	0	0%	0	0%
d. I use contextualized vocabulary with my	9	60%	5	33%	0	0%	1	7%	0	0%

	students when teaching vocabulary								
e.	I use or encourage some form of movement in my classroom to help with focus, attention, and retention	3	20%	7	46%	3	20%	1	7%	1	7%
f.	I am knowledgeable about the use of providing frequent, non-judgmental feedback as a useful tool to enhance vocabulary retention	7	46%	4	27%	2	13%	1	7%	1	7%
g.	Teachers should engage student in learning	10	66%	4	27%	1	7%	0	0%	0	0%

Table 35: Teachers' Agreement/ Disagreement with the Statements

The table above presents percentages for the knowledge of brain-based learning questions that were designed to address the teachers' beliefs about brain-based learning and the indicators of it. Seven questions were presented to indicate the level of knowledge with the agreement that teachers have in the area of brain-based learning. Participants were asked to indicate: Strongly agree, agree, Neuter, strongly disagree, or disagree. Of the 15 teachers in the study, 11 (47%) indicated they agreed they have sufficient understanding of how the brain learns, 2 teachers which represent (13%) neither agreed nor disagreed, and 2 of the teachers (13%) disagreed.

However, the results indicate a high level of disagreement for the question of whether it is important to practice various learning strategies as part of their teaching. In this question, eight respondents (53%) strongly disagreed, 5 teachers with the rate of (33%) disagreed, one teacher (7%) neither disagreed nor agreed, and only one teacher (7%) agreed. The teachers' answers reflect good amount of belief in the area of brain-based learning, 53% of teachers pointed a strong agreement on the importance of the way pupils learn in learning, 4 teachers (27%) agreed, and 3 teachers with the rate of (20%) neither agreed nor disagreed.

Besides, 60% of teachers indicate strongly agreed they use contextualized vocabulary with pupils when teaching, 33% of teachers agreed, and only 7% disagreed. However, when asked if the teachers use or encourage some form of movement in their classroom to help with focus, attention, and retention. Three teachers (20%) strongly agreed, seven teachers (46%) agreed, 20% of teachers neither agreed nor disagreed, one teacher disagreed and one teacher (7%) strongly disagreed

Furthermore, when the teachers were asked about feedback teachers indicated a high level of agreement with the statement, 7 respondents (46%) strongly agreed they were knowledgeable about providing frequent, non-judgmental feedback, 4 respondents (27%) agreed, two teachers (3%) neither agreed nor disagreed, one teacher disagreed, and one respondent strongly disagreed. In the same path, the last given question was to indicate if teachers include students in learning or not. In this question 10 teachers (66%) strongly agreed, 4 (27%) agreed, and only one teacher neither agreed nor disagreed.

Item 16. When evaluating pupils' vocabulary size, retention and use, do you evaluate them in a way that accounts for the fact that they learn differently? Why?

Teacher	Response
T1.	**When evaluating the learners' vocabulary, we don't use different ways or taking into consideration their different learning strategies.**
T2.	**Sure, since I account for the fact that they learn differently when I teach them, I do when I evaluate them because I believe that learners don't have the same interests and abilities so I do that to encourage them to learn more.**
T3.	**No, I don't because through my experience I figured that all of them depend on memorization in the whole learning process**
T4.	**Yes.**
T5.	**Yes. According to their ability and level of understanding**
T6.	**Yes. Because pupils use different learning strategies. That leads me to vary the activities.**

T7.	**Learners are equal concerning what they get or what the teacher gives but are unequal on what they are giving back, but we have to encourage any kind of involvement**
T8.	**Yes, otherwise it would be unfair to consider them as having equal learning styles**
T9.	**No, I have to treat them in the same way otherwise I would feel that I have done something that God will not be pleased about**
T10.	**Yes, I evaluate them differently since they learn differently. Some learners best at pronouncing and speaking, others prefer to answer on the paper ...etc**
T11.	**Didn't get you**
T12.	**Yes, because each human being differs from others in capacities**
T13.	**Yes indeed. Each one has his or her capacity in learning vocabulary**
T14.	**When evaluating the learners' vocabulary, we don't use different ways nor taking into consideration their different learning strategies.**
T15.	**Sure, since I account for the fact that they learn differently when I teach them or evaluate them because I believe that learners don't have the same interests and abilities so I do that to encourage them to learn more.**

Table 36 Teachers' Responses about Whether they Evaluate their Pupils in a Way That Accounts for the Fact That They Learn Differently

The table above indicates that most teachers claimed they evaluate their students keeping in mind their individual differences in learning and capacities to encourage them. In contrast, there are some teachers who have a negative view about treating and assessing pupils according to their learning differences and treat all learners the same.

• If you have any comments or suggestions, please feel free to add them

The answers of the teachers were different, some of them insist to give more importance to the language in middle schools and the others advised other teachers to depend on different approaches, materials and strategies in teaching English.

5. Discussion of the findings

5.1. Discussion of students' questionnaire

The analysis of the data gathered from the pupils' questionnaire provides different information and precious responses that supported our hypothesis. First of all, the majority of learners find the English language easy compared to other languages. Pupils also are aware of the

importance of vocabulary and its vital role in language learning; despite the fact that they face difficulties during the process of learning vocabulary. Furthermore, teachers help their pupils by using several methods. Learners prefer to consolidate entertaining methods in the learning process since it has a powerful effectiveness in learners' acquisition of new lexical items. Nevertheless, most of the pupils suffer from many difficulties related to their vocabulary retention due to the reason that pupils are beginners and they need more effective techniques on the part of the teachers.

When speaking about the participants' viewpoint towards the role of vocabulary retention in the language, the outcomes demonstrate that all participants are more conscious about the vital role that it plays in developing their language skills. However, to gain more data concerning the necessity of using new strategies used to develop pupils' vocabulary retention, the findings shows that most pupils have positive attitude since it motivates and involves them more in learning vocabulary. Furthermore, we have noticed from the pupils' answers that teachers consider their pupils' learning differences and include several strategies. Nevertheless, Pupils presented a positive attitude toward the use of entertaining ways to learn vocabulary and retaining it as well as for relating what they learned to real-life or story. Besides, the majority of pupils believe that brain-based learning strategy is effective, beneficial and has impact on vocabulary learning and retention, and they agreed that brain-based learning strategy is helpful to increase their vocabulary retention.

Moreover, Pupils prefer to be interacted and incorporated in the learning process as well as to perform actions and the involvement in games. They like to learn through comprehensible input to develop their vocabulary due to its essential role in learning English. However, they can learn better from simple and clear strategies that attract their attention and curiosity.

5.2. Discussion of teachers' interview

Based on the data gathered and analysed from the teacher's interview above, wide range of information and facts were revealed that is beneficial to answer some of the fundamental research

questions. The study has delivered interesting results concerning the relationship between our variables, vocabulary retention and brain-based learning strategy. Indeed, the study revealed that teachers are aware of the importance of vocabulary; thus teachers introduce new vocabulary in each lesson. the teachers used different kinds of strategies to introduce vocabulary, therefore, Teachers agree that even if they do their best to facilitate the process of learning vocabulary, pupils still face difficulties mostly in recalling and retaining new words and their use.

Accordingly, teachers try to create an enjoyable learning atmosphere that breaks the routine through the use of different teaching materials, Teachers use different kinds of materials to treat the different learners' style. Some teachers opted for brain-based activities to teach new vocabulary, these techniques are very practical ways of teaching, because learning depends on the brain and this strategy tend to manage students brains with entertaining activities with different teaching environment that pleases pupils to learn the vocabulary and this may boost their retention.

We asked the teachers about the usefulness of brain-based learning strategy for increasing vocabulary retention; almost all the teachers showed a positive attitude toward the effectiveness of the strategy to enhance pupils' vocabulary retention and agreed to use it if they know more about it. Though, From the major findings, we conclude that the teachers encourage and support the use of the strategy to teach vocabulary to enhance vocabulary retention due to the usefulness and effectiveness of this strategy for engaging and developing pupils' vocabulary retention, and creates a comfortable and entertaining environment that suits the new generation of students. Finally, this result demonstrated both teachers and students that finding the brain-based learning strategy in learning is effective and beneficial for learners to improve vocabulary retention and to acquire new vocabulary.

Conclusion

The current chapter deals with the fieldwork of this research study that aimed at investigating the role of brain-based learning strategy in develop middle school pupils' vocabulary retention.

Besides, a description of the theoretical background about the methodology of the study was presented. In addition, the data collected through this study followed by analysis and interpretation of data. Moreover, In the light of the data obtained from teachers' interview and pupils' questionnaire, we can notice significant and shared insights between teachers and learners regarding brain-based learning strategy and vocabulary retention, which demonstrated the effectiveness of the strategy to develop pupils' vocabulary retention. All in all, brain-based learning strategy is a useful teaching strategy through which vocabulary retention can be promoted and developed.

Recommendations

Based on the results and conclusions of this study, the following recommendations were offered

- Brain-based learning strategy is recommended to be used as a framework for enhancing vocabulary retention with middle school pupils.

- Ministry of Education should train middle school teachers with respect to the use of language learning strategies, Brain-based teaching strategies are included, in order to help their students to learn English language vocabulary effectively.

- Middle school teachers should train their students in the use of various types of language learning strategies.

- Middle school teachers should plan activities that motivate students to use new vocabulary learning strategies and provide practice opportunities.

- Course designers should consider the inclusion of Brain-based learning strategies when developing English courses, particularly in middle school.

- New techniques for enhancing vocabulary learning and retention should be explored and exploited, so that learners will easily make their way to their proficiency goals.

General conclusion

One of the most important and difficult tasks for learners, especially beginner is mastering vocabulary. It seems to be a hard mission since English is a new language for pupils. They try to memorize an adequate amount of words without even understanding how to use them. Therefore, many teachers attempt to develop new strategies that encourage learners to learn English without feeling bored, away from rote learning. Hence, we have tried to shed light on one of those strategies which is brain-based learning. Brain-based learning strategy allows pupils to go beyond the usual learning horizon which makes them practice the language spontaneously.

The present research aimed mainly to investigate the role of brain-based learning strategy in developing middle school pupils' vocabulary retention. In order to achieve the intended aim, a qualitative research approach was adopted. Moreover, a semi-structured questionnaire and a semi-structured interview were used as data collection methods. Throughout this research, we have scrutinized the teachers and pupils' attitude toward brain-based learning strategy and its effectiveness on vocabulary retention. The major objective of this study has been to highlight the central part that brain-based learning strategy plays in increasing pupils' vocabulary retention. Therefore, we aim through this research to draw the teachers' attention to brain-based learning to encourage their students to learn vocabulary and enhance their retention. In light of the present results, this study succeeded to provide answers to the research questions and confirm the research hypotheses: if Brain-based learning strategy is used while teaching vocabulary, pupils' vocabulary retention will be enhanced, and retention difficulties can be traced.

Finally, the present work consists of three chapters. The first and second chapters are devoted to a theoretical part which is purely descriptive, reviewing related literature. Whereas, the third chapter was concerned with the practical part.

References

Atkinson, R., & Shiffrin, R. (1968). human memory: Aproposed system and its control processes. Psychology of Leaening and Motivation.

Ebbinghaus, H. (1885/1913). *Memory: A contribution to experimental psychology.* New York: teachers college, columbia university.

Farr, J. (1986). *The long-term retention of knowledge and skills: A cognitive and instructional prespective.*

Gairns, R., & Redman, S. (1986). *Working with words: A guide to teaching and learning vocabulary.* United Kingdom: Combridge University Press.

Gilbert, S., & Beatrice, W. (2005). *The international journal of teaching and education.* Retrieved from file:///C:/Users/client/Desktop/Downloads/'12-2-213%20(2).pdf

Greenleaf, R. K. (2003). Motion and Emotions. *Principle Leadership*, 14.

Gutlohn , L., & Diamond, L. (2006, december 09). *Reading Rocket.* Retrieved from https://www.readingrockets.org/article/teaching-vocabulary

Herrel, A. (2004). *Fifty strategies for teaching English languag learners.An ESL teacher's tool kit. 2en ed.* Canada: Penguin publisher.

Hummel, K. (2013). *Introducing second language acquisition: Prespective and practices.* UK: John Wiley & Sons.

Lombardi, J. (n.d.). *Practical Ways Brain-based Research Applies to ESL Learners.* Retrieved from The Internet TESL Journal: http://aitech.ac.jp/~iteslj/Articles/Lombardi-BrainResearch.html

McArthur, T. (1992). *The Oxford Companion to the English Language.* Oxford university press.

Moghadam, A. N., & Araghi, S. M. (2013). Brain-Based aspects of cognitive learning approach in second language learning. *English Language Teaching*, 55-61.

Oberauer, K., & Lewandowsky, S. (2008). Forgetting in immediate serial recall: Decay, temporal distinctiveness, or interference.

Oxford Learner's Dictionaries. (2019). Retrieved from https://www.oxfordlearnersdictionaries.com/definition/english/vocabulary?q=vocabulary

Pool, C. R. (1997). Maximizing learning: A conversation with Renate Nummela Caine. *Educational Leadership*, 11-15.

Richard, C., & Schmidt, R. (2002). Dictionary of language teaching and applied linguistics. New York: Pearson Education.

Ruth, G., & Stuart, R. (1986). *Working with words* . Cambridge: University press.

Sprenger, M. (2010). *Brain based teaching in digital age.* Alexandria: VA: ASCD.

Sun, M. (2012). *Hard science linguistics and brain-based teaching: the implications for second language teaching*. Retrieved from Theses and Dissertations: https://www.utoledo.edu/graduate/currentstudents/thesis_dissertation/

Tang, Y. (2017). *Brain-based learning and education: Principles and practice.* UK: Academic Press,.

Taylor, L. (1990). *teaching and learning vocabulary.* Herefordshire, UK: Prentice Hall International.

Willis, J. (2006). *Research-based strategies to ignite student learning: Insights from a neurologist and classroom teachers.* Alexndria: VA: ASCD.

Appendices

Appendix 1: Students' Questionnaire

Student questionnaire /استبيان التلاميذ

عزيز(ت)ي التلميذ(ة)،

أنت مدعو(ة) لملئ هذا الاستبيان الموجه لجمع معلومات من أجل إتمام مذكرة تخرج في ماستر في اللغة الإنجليزية. هذا الاستبيان يهدف

الى التعرف على آرائكم حول "دور استراتيجية التعلم القائم على تفعيل الدماغ في تطوير الاحتفاظ بمفردات اللغة الانجليزية لتلاميذ

طور المتوسطة". سأكون جد ممتنة إذا اجبت بكل صدق. من فضلك ضع(ي) علامة (√) على الاختيارات المناسبة وقدم أجوبة كاملة

كلما تطلب الأمر. كن/ كوني على ثقة بأن إجاباتك ستكون في غاية السرية وستستخدم لغرض البحث وفقط.

.شكرا لك على وقتك وتعاونك

Dear pupils,

you are kindly requested to answer this questionnaire, which is an attempt to collect information

needed in order to collect data for the accomplishment of a master dissertation on "The role of

brain-based learning strategy in develop middle school pupils' vocabulary retention". Therefore,

you are kindly requested to fill it in by ticking (√) the appropriate answer(s) and write full

statements whenever it is necessary. Be sure that your answers will be anonymous and will be

used for research purposes only.

Your time, effort and collaboration are highly appreciated in advance.

Researcher's name: Supervised by:

Izzgheche Kaouthar   Mr. Bechar Maamer

Email: kaouthar.izzgheche38@gmail.com

part one: general information	الجزء الأول: معلومات عامة
Q1: How long have you been learning English?	س1: منذ متى وأنت تتعلم اللغة الإنجليزية؟
a. Less than three years ☐	ا- أقل من ثلاث سنوات ☐
b. More than three years ☐	ب- أكثر من ثلاث سنوات ☐
Q2: How do you find learning English?	س2: كيف تجد تعلم اللغة الإنجليزية؟
a. Easy to learn ☐	ا- سهلة التعلم ☐
b. It's kind of hard ☐	ب- صعبة نوعا ما ☐
c. Very difficult ☐	ج- صعبة جدا ☐
Justify your answer, please.	برر(ي) اجابتك من فضلك
……………………………………………………	……………………………………………
Part two: vocabulary learning	**الجزء الثاني: تعلم المفردات**
Q3: Do you think that vocabulary is important to learn English language?	س3: هل تعتقد أن المفردات مهمة لتعلم اللغة الإنجليزية؟
Yes ☐ No ☐	نعم ☐ لا ☐
Justify your answer ………………………………………	برر اجابتك ……………………………………………
……………………………………………………	س4: ما الذي يستخدمه معلمك لتسهيل تعلم كلمات جديدة في القسم؟
Q4: what does your teacher use to facilitate learning new words in classroom?	(يمكنك اختيار أكثر من إجابة واحدة)
	ا- العاب تعليمية ☐
a. Educational games ☐	ب- صور ☐
b. Pictures ☐	ج- مقاطع صوتية ☐
c. Audio aids ☐	د- فيديوهات ☐
	ه- لغة الجسد (حركات الجسد) ☐
	و- جميعها ☐

d. Videos ☐

e. Gestures ☐

f. All of them ☐

If there are other ways, please mention them ……………..

…………………………………….………………

Q5: Which of the methods mentioned above in (Q4) do you

prefer more?

…………………………………………………

Q6: Where do you face more difficulties? (You may choose

more than one answer.)

a. During learning ☐

b. In understanding the new vocabulary ☐

c. In pronouncing and writing vocabulary ☐

d. Recalling and using new vocabulary ☐

If you are facing another problem, identify it please

…………………………………………………..

Part three: vocabulary retention

Q7: To what extent do you find retaining and remembering

vocabulary useful in learning the English language?

a. Very useful ☐

b. Kind of useful. ☐

في حالة وجود طرق اخرى، اذكرها من فضلك ....

....

س5: أي من الوسائل المذكورة اعلاه في (س4) تفضل أكثر؟

…………………………………………………

س6: أين تجد صعوبة أكثر؟ (يمكنك اختيار أكثر من إجابة واحدة)

ا- أثناء التعلم ☐

ب- في فهم المفردات الجديدة ☐

ج- في نطق وكتابة المفردات ☐

د- في تذكر واستعمال المفردات الجديدة ☐

إذا كنت تواجه(ين) صعوبة اخرى، حدد(ي)ها من فضلك

…………………………………………………

الجزء الثالث: الاحتفاظ بالمفردات

س7: إلى أي مدى تجد(ين) الاحتفاظ بالمفردات وتذكرها مفيدا في تعلم

اللغة الإنجليزية؟

ا- مفيد جدا ☐

ب- مفيد نوعا ما ☐

غير مفيد إطلاقا ☐

برر(ي) اجابتك من فضلك ....

....

س8: كيف تجد(ين) تذكر مفردات اللغة الإنجليزية؟

ا- صعب للغاية ☐

ب- متوسط الصعوبة ☐

English	Arabic
c. Totally useless. ☐	ج- سهل ☐
Justify your answer, please.	د- في غاية السهولة ☐
Q8: How do you find retaining English vocabulary?	س9: في رأيك، ما هو الجانب الأكثر صعوبة في الاحتفاظ بالمفردات الإنجليزية؟
a. Very difficult ☐	أ- التهجئة ☐
b.	ب- النطق ☐
c. Easy ☐	ج-المعنى ☐
d. very easy ☐	برر(ي) اجابتك من فضلك ....
Q9: In your opinion, what is the most difficult aspect in retaining English vocabulary?	س10: ما هي الاستراتيجيات المختلفة التي يستخدمها معلمك لتحسين الاحتفاظ بمفردات اللغة الإنجليزية؟ (يمكنك اختيار أكثر من إجابة واحدة)
a. Spelling ☐	أ- الترجمة ☐
b. Pronunciation ☐	ب- تكرار الكلمات ☐
c. Meaning ☐	ج- استخدام المفردات في جمل مختلفة ☐
Justify your answer	د- التعاريف ☐
Q10: what are the different strategies that your teacher use to improve your English vocabulary retention? (You may choose more than one answer)	ه- الرسم ☐
	آخرى...
a. Translations ☐	س11: في رأيك، هل من الضروري استخدام طرق جديدة لتدريس مفردات الإنجليزية؟
b. Repetition of the words ☐	
c. Using vocabulary in different sentences ☐	نعم ☐ لا ☐
d. Definitions ☐	

e. Drawings ☐

Others………………………………………………………

Q11: In your opinion, is it necessary to use new methods for

teaching English vocabulary?

Yes ☐   No ☐

If the answer is "yes", what are the new methods that you

think are appropriate for teaching English vocabulary?

………………………………………………………

Part three: brain based strategy

Q12: Does your teacher use audiovisual materials in the classroom

to improve your vocabulary retention**?**

Yes ☐   No ☐

If yes, what kind of audio visual does s/he use? (You may

choose more than one answer)

a. Power point ☐

a. Computer/ internet ☐

b. Audio aids/ songs ☐

c. videos ☐

Others ………………………………..............

Q13: Does your teacher connect what you are learning to

your own life or through a story?

إذا كانت الاجابة "نعم"، ماهي الطرق الحديثة التي تراها مناسبة لتدريس

المفردات الانجليزية؟

....

الجزء الرابع: إستراتيجية الاستناد على الدماغ

س12: هل يستخدم أستاذك الوسائل السمعية البصرية في القسم لتحسين

ترسيخ المفردات؟

نعم ☐   لا ☐

إذا كانت الإجابة بنعم، فما نوع الوسائل السمعية البصرية التي

يستخدمها؟ (يمكنك اختيار أكثر من إجابة واحدة)

عروض الباوربوينت ☐

استخدام الحاسوب / الانترنت ☐

مقاطع صوتية/ الاغاني ☐

مقاطع فيديو ☐

أخرى ....

س 13: هل يربط المعلم ما تتعلمه بحياتك أو بقصة ما؟

نعم ☐   لا ☐

* س 14: هل يطلب/تطلب منكم الأستاذ(ة) ترديد المفردات في القسم؟

ا- نعم ☐

ب- لا ☐

س15: هل تعتقد أن استخدام طرق مسلية في تدريس المفردات سيحسن

الاحتفاظ بها؟

ا- نعم ☐

Yes ☐　　　　　No ☐

Q14: does your teacher make you practice the words learned in classroom?

a. Yes ☐

b. No ☐

Q15: do you think that using entertaining ways in teaching vocabulary will improve your vocabulary retention?

a. Yes ☐

b. No ☐

provide an explanation, pleaase …………………………….. ……………………………………………..

Q16: List any word/s you remember learning in the class and why you remember it?

....

Q17: How long do you often retain vocabulary you have learned before forgetting it?

a. Few hours ☐

b. Few days ☐

c. Few weeks ☐

d. Few months ☐

ب- لا ☐

قدم(ي) شرحا من فضلك ....

....

س16: اذكر أي كلمة / كلمات تتذكر أنك تعلمتها في القسم ولماذا تتذكرها؟

....

س17: لكم من الوقت تستطيع ذاكرتك الاحتفاظ بما تعلمته من المفردات الجديدة؟

ا- لساعات معدودة ☐

ب- لأيام قليلة ☐

ج- لأسابيع قليلة ☐

د- لأشهر ☐

س18: حسب رأيك، ماهي اهم العوامل المساعدة على اكتساب وفهم وتخزين وتذكر المفردات الجديدة؟ (يمكنك اختيار أكثر من إجابة واحدة.)

ا- تعلق التلميذ باللغة واهتمامه بتعلمها ☐

ب- كفاءة الأستاذ ☐

ج- الوسائل المستعملة للتعليم ☐

د- طرق التلقين ☐

ه- توافق وسائل التعليم وطرق التلقين بأساليب التعلم الخاصة بالتلاميذ ☐

و- جميعها ☐

Q18: In your opinion, what are the most important factors that help you to learn, understand, retain and remember new vocabulary?	أخرى .... س19: إلى أي مدى ترى(ين) استعمال وسائل ونشاطات محفزة للعقل ضروريا لتعلم مفردات جديدة؟
a. Pupils interests in learning the language ☐	ا- ضروري جدا ☐
b. Teacher competence ☐	ب- ضروري نوعا ما ☐
c. Means of education ☐	ج- غير ضروري على الإطلاق ☐
d. Methods of teaching ☐	برر(ي) اجابتك من فضلك..
e. the means of education and the methods of teaching are compatible with pupil's way of learning ☐	س20: من بين النشطات التالية ماهي النشاطات التي يستخدمها استاذك أكثر في القسم لتحفيز عقول التلاميذ على الاحتفاظ واسترجاع مفردات اللغة الانجليزية؟ (يمكنك اختيار أكثر من إجابة واحدة)
f. all of them ☐	ا- العاب التهجئة والكلمات المتقاطعة ☐
others …………………………………………..	ب- ربط المفردات بصورها او معانيها ☐
Q19: To what extent do you think the use of brain based strategies and activities is necessary to learn new vocabulary?	ج- الإيماء (استخدام لغة الجسد) ☐
	د- ملئ الفراغات بالكلمات المناسبة ☐
a. Very important ☐	ه- الرسم ☐
b. Somehow important ☐	أخرى ....
c. Not important at all ☐	س21: كيف يقوم أستاذكم بتقييم ما اكتسبتموه وما تحتفظون به من مفردات؟
justified your answer, please……………………………… …………………………………………………………	....
Q20: Among the following activities, what activities does your teacher use more in the classroom to motivate you to retain and retrieve the English vocabulary? (You can choose more than one answer.)	

a. Spelling games and crossword puzzles ☐

b. Linking vocabulary to its images or meanings ☐

c. Use of gestures ☐

d. Fill in the blanks with the right words ☐

e. E- Drawing ☐

Others ……………………………………………………..

Q21: how does your teacher assess your vocabulary retention?

……………………………………………………………………

Appendix 2: Teachers' Interview

Teachers' Interview

Dear teachers,

The following interview is for second year middle school teachers. It would be grateful if you answer these questions which is a part of academic research. Which aims at exploring your attitudes towards "The role of brain-based learning strategy in developing middle school pupils' vocabulary retention" Your precious contribution in this research is mostly appreciated and would be a great help for us.

Thank you in advance for your collaboration

Please read the following definitions before completing the interview which follow:

There are currently many working definitions of brain-based education. Multiple approaches are being made to better define the term "brain-based." For this study, brain-based education is defined as: using strategies and activities that utilize all parts of the brain, in order to help students learn more effectively. Brain-Based Learning is a learning approach that is more aligned with how the brain naturally learns best. Brain-Based Learning is a way of thinking about the learning process. It is learning with the brain in mind.

Brain-Based Learning is providing for differences in learning. Encouraging students to learn with music, mind maps, role plays, journals, model building, movement, community projects, theatre, art, etc. (Jensen, 2000).

Q1: How long have you been teaching English? What degree do you have?

a. 1-5 years

b. 5-10 years

c. More than 10 years

Q2: What degree do you have?

    a. License

    b. Master

    c. Magister

    d. Doctorate

Q3: Do you think teaching vocabulary is important for learning English language?

    a. Yes

    b. No

Justify please …………………………………………………………………………………………

Q4: do you present vocabulary in every lesson?

    a. Yes

    b. No

If yes, for what purpose?

………………………………………………………………………………………………………

Q5: What are the main strategies that you use to teach/ introduce vocabulary? (You may choose more than one answer)

    a. Educational games

    b. Pictures

    c. Engage students in learning

    d. Videos

    e. Gestures/ body language

    f. All of them

Others …………………………………………………………………….

Q6: How do you evaluate your pupils' vocabulary size?

   a. Very good

   b. Medium

   c. Poor

Q7: What are the main difficulties that your students face when learning English vocabulary?

   a. In understanding the new vocabulary

   b. In pronouncing and writing the acquired words

   c. In retaining the acquired words

   d. Recalling and using new words

Others…………………………………………………………………………………

Q8: According to you, what are the main factors that affect the students' learning, retaining, and

recalling? (You may choose more than one answer)

   a. Pupils interests in learning the language

   b. Teacher competence

   c. The use of appropriate teaching approaches and methods

   d. The use of appropriate teaching materials

   e. The compatibility of the teaching methods and the instructional teaching materials with pupil's way of learning

   f. More than one factor

   g. All of them

Others …………………………………………………………………………..

Q9: How do you consider the role of vocabulary retention in the language learning process?

…………………………………………………………………………….

Q10: According to you, what may help pupils retain new words?

a. The use of different teaching materials

b. The knowledge about how the brain acquires, memorize, retain and recall the words

c. The use of entertaining strategies to teach new vocabulary

d. The use of brain-based activities to teach new vocabulary

justify your answer please …………………………………………………….

Q11: How do you help your students to overtake vocabulary retention difficulties?

……………………………………………………………………………………

Q12: Would you be more willing to initiate brain-based learning if you knew more about it?

   a. Yes

   b. No

Q13: If you know that Brain-Based Learning is "Providing for differences in learning through encouraging students to learn with music, mind maps, role play, journals, model building, movement, community projects, theatre, art, etc." (Jnsen, 2000), to what extent do you think it can be useful for increasing vocabulary retention? Justify your answer; please.

………………………………………………………………………………..

Q14: According to you, which of the following brain-based activities can be useful for new vocabulary retention? (You may choose more than one answer).

   a. Students drawings

   b. Visual organizers (mind-maps…)

   c. Cross-words

   d. Matching words of their meanings or pictures

   e. Physical actions (Demonstrations)

f. Fill in the gaps' activities

g. More than one activity

h. All of them

others…………………………………………………………………………………………

Q15: To what extent do you agree or disagree with the following statements?

Statements	Strongly agree	Agree	Neuter	Disagree	Strongly disagree
a. I have sufficient understanding of how the brain learns.					
b. It is not important to practice various learning strategies in my classroom					
c. I feel that how one learns, plays an important role in classroom learning.					
d. I use Contextualized vocabulary with my students when teaching vocabulary					
e. I use or encourage some form of movement in my classroom to help with focus, attention, and retention.					
f. I am knowledgeable about the use of providing frequent, non-judgmental feedback as a useful tool to enhance vocabulary retention.					
g. Teachers should engage students in learning					

Q16: When evaluating pupils' vocabulary size, retention and use, do you evaluate them in a way that accounts for the fact that they learn differently? Why?

…………………………………………………………………………………………………

If you have any comments or suggestions, please feel free to add them

…………………………………………………………………………………………………

Thank you for your time, effort and collaboration

الملخص

هدفت الدراسة الحالية إلى تطوير الاحتفاظ بمفردات اللغة الانجليزية لتلاميذ طور المتوسطة من خلال استراتيجية التعلم القائم على تفعيل الدماغ. كما سعت هذه الدراسة أيضا الى جذب انتباه الأساتذة الى هذه الاستراتيجية الجديدة. لتحقيق هذه الأهداف تم استعمال أداتين لجمع البيانات و التي تم تمثّلت في استبيان موجّه لتلاميذ طور المتوسط في بسكرة، الجزائر، إضافة إلى مقابلة مع أساتذة اللغة الانجليزية في طور المتوسط. و قد أظهرت النتائج أن استراتيجية التعلم القائم على تفعيل الدماغ تساعد الطلاب إلى حد كبير في تخفيف النسيان و تحسين الاحتفاظ طويل الأمد بمفردات اللغة الانجليزية. كما أشارت النتائج الى أن الاستراتيجية لقت استحسان كبير من طرف الاساتذة.

الكلمات المفتاحية: الاحتفاظ بالمفردات، استراتيجية التعلم القائم على تفعيل الدماغ، المفردات.