

The Impact of Using Brain –Based Learning Theory to Develop Iraqi EFL Students` in Vocabulary Acquisition at Secondary School

Assist.prof. Samiya Mohammed Razoqey Al-aajam 
Corresponding author : samia_m.alaaajem@yahoo.com

University of Diyala- College of Basic Education

Date of research submission :25 /8/2024

Date of publication acceptance : 9/10/2024

Date of publication:18/3/2025



FA/202503/29E/19/623

[Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

DOI: <https://doi.org/10.23813/FA/29/1/19>

ABSTRACT

The purpose of this study is to determine how brain-based learning theory might help Iraqi EFL students improve their vocabulary acquisition in secondary education. In order to fulfill the current study's objective, the following hypothesis has been proposed: On the vocabulary acquisition post-test, there are no statistically significant differences ($\alpha \leq 0.05$) between the mean scores of the experimental group, which receives instruction based on the brain-based learning theory, and the control group, which receives instruction in accordance with traditional methods. The present study is limited to “the 4th secondary school female students in Al-aadnanyia secondary school for girls in Baaquba City”, for the academic year 2023-2024. The sample of the study was (84) female students, 43 students as the experimental group and 41 as the control group. Then, using statistical manipulation of a variety of variables, including age, parents' educational attainment, English accomplishment scores from the prior year, and pretest achievement scores, it is ensured that the two groups are equivalent. The validity of the pre- and post-tests was determined by exposing them to jury members who are experts in linguistics and EFL. The Kuder Richardson-20 Formula (0.86) has been used to ensure the test's dependability. The results of the test's statistical analysis show

that the experimental group performed better on the post-test and that there are statistically significant differences between the two groups' mean scores.

The researcher has come to the conclusion that applying the brain-based learning theory has inspired students, piqued their curiosity, and enhanced their involvement in vocabulary acquisition activities. Students now feel more self-assured, independent, and driven, which reflects in their capacity to perform better. According to the study, teachers should use the brain-based learning theory to teach English in a low-stress, relaxing setting.

Key words: brain—based learning theory, vocabulary acquisition

اثر استخدام نظرية التعلم المستند على الدماغ في تطوير اكتساب المفردات للطلبة العراقيين دارسي اللغة الانكليزية لغة اجنبية في المدارس الثانوية

أ.م. سامية محمد رزوقي الاعجم 

Corresponding author : samia_m.alaaajem@yahoo.com

جامعة ديالى – كلية التربية الاساسية

تاريخ استلام البحث : 2024/8/25- تاريخ قبول النشر : 2024/10/9

تاريخ النشر : 2025/3/18

FA/202503/29E/19/623



[Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

DOI: <https://doi.org/10.23813/FA/29/1/19>

المستخلص

يهدف البحث التحقق من أثر استخدام نظرية التعلم المستند الى الدماغ في تطوير اكتساب المفردات للطلبة العراقيين دارسي اللغة الانكليزية لغة اجنبية في المدارس الاعدادية. وللتحقق من الهدف صيغت الفرضية الصفرية : " (لا يوجد فرق ذو دلالة إحصائية عند مستوى دلالة (0,05) بين متوسط درجات الطلبة في المجموعة التجريبية الذين درسوا باستخدام نظرية التعلم المستند الى الدماغ ومتوسط درجات الطلبة في المجموعة الضابطة الذين درسوا وفق الطريقة الاعتيادية في الاختبار البعدي لاكتساب المفردات". تبنت الباحثة التصميم التجريبي للضبط الجزئي للمجموعتين التجريبية والضابطة تضبط أحدهما الاخرى ذات الاختبار البعدي في اكتساب المفردات. أجريت هذه التجربة على عينة تتألف من (85 طالبة). وحددت الدراسة على صف الرابع اعدادي في ثانوية العدنانية في مدينة بعقوبة. وكانت العينة

تشمل 43 طالبة في المجموعة التجريبية و41 طالبة في المجموعة الضابطة. بعد ذلك تم التأكد من تكافؤ المجموعتين من خلال العمليات الاحصائية التي تشمل مجموعة من المتغيرات مثل: العمر وتحصيل الوالدين ودرجاتهم في امتحان اللغة الانكليزية للعام الدراسي 2023-2024. تم تصميم كلا الاختبارين (القبلي والبعدي) وخطه الدرس من قبل الباحثة. وتم التأكد من صلاحية وصدق الادوات، بعرضهما على الخبراء في مجالات طرائق تدريس اللغة الانكليزية وعلم اللغة، وتم التأكد من ثبات الاختبار من خلال معادلة كودر رتشرسون والتي كانت (0.86). وبعد الانتهاء من التجربة حللت الباحثة البيانات احصائياً باستخدام t test ، توصلت الباحثة إلى وجود فروق ذات دلالة إحصائية بين المجموعتين (التجريبية والضابطة) في مهارة اكتساب المفردات في نتائج الاختبار البعدي ولصالح المجموعة التجريبية. وخلصت الباحثة إلى أن استخدام نظرية التعلم المستند الى الدماغ قد حفز الطلاب وأثار اهتمامهم وزاد من مشاركتهم في أنشطة اكتساب المفردات، وجعل الطلاب أكثر ثقة واستقلالية ودافعية وهذا يعكس قدراتهم على الأداء بشكل أفضل. وأوصت الدراسة المدرسين بضرورة اعتماد نظرية التعلم المستند الى الدماغ في تدريس اللغة الإنجليزية من خلال توفير بيئة مريحة منخفضة التهديد.

الكلمات المفتاحية: نظرية التعلم المستند الى الدماغ ، اكتساب المفردات

Introduction

Learning vocabulary is crucial to learning a language. Acquiring vocabulary is also necessary for learning how to write, speak, read, and listen. People cannot properly communicate or express their feelings in written or verbal form without a suitable vocabulary. People can read, write, speak, and listen as they choose when they have a greater command of vocabulary. Wilkins and Thornbury (2004: 13) asserts that nothing can be communicated without vocabulary and that very little can be communicated without grammar. It implies that even if someone knows proper grammar, it won't matter if they don't have a large vocabulary. Furthermore, Ur (1996: 60) "supports the idea that one of the most crucial things to teach when learning a foreign language is vocabulary because without a wide vocabulary, it is impossible to communicate".

The term "brain-based learning" describes instructional strategies, lesson plans, and curricula that are based on the most recent scientific findings regarding the workings of the brain. These include aspects like cognitive development, or the ways in which students' learning changes as they become older, more

mature, and more socially, emotionally, and cognitively. According to brain-based learning, for learning to be effective, the emphasis should be shifted from the teacher to the student. According to Caine and Caine (1999), it entails students actively creating their own knowledge in a variety of learning environments. The goal of brain-based learning methodologies is to optimize the brain's functioning capacity in a supportive setting. According to Stevens and Goldberg (2001), using brain research findings in instructional design leads to the use of brain-compatible instruction rather than brain-antagonistic training. According to Immodino-Yang (2011), neuroscientists have proven that a variety of elements, including food, stress, emotional states of learners, surroundings, sleep quality, music, color, oxygen, movement, exercise, serotonin, and water intake, can impact brain function. The underlying tenet of brain-based learning strategies is the widespread conviction that learning can be enhanced and expedited if teachers focus their instruction on the science of learning rather than on customs, historical practices, or presumptions about how people learn.

1.1.The Problem and its Significance

Learning vocabulary is a crucial part of learning a language. Many studies have been conducted, and the overwhelming evidence suggests that incidental (unplanned or indirect learning) language interactions contribute significantly to acquisition of vocabulary. Lately, there has been a resurgence of awareness in the nature of vocabulary and its function in teaching and learning, as well as in vocabulary acquisition studies. The majority of pupils in Iraqi classrooms, according to Gatti (2004: 3), spent years learning English grammar, but they are still unable to speak the language well. The acquisition of language was not given much priority by Iraqi teachers, and vocabulary testing received much less attention. The pupils were merely required to translate a group of Arabic words and phrases into English for the purpose of testing. After taking the test and learning a lot of new terms, the student usually forgot many of the words after a few days. As a result, because

teachers spent a lot more time on grammar in their lectures, pupils were consistently better at it than vocabulary (AL-khazaley, 2013:2). A language's grammar is a component. Without a doubt, using proper grammar will enable us to write and talk clearly. More significantly, though, is that proficient vocabulary is necessary for both writing and speaking well. Numerous studies have demonstrated that vocabulary and prior knowledge can improve pupils' reading and comprehension. Students' ability to decipher and comprehend what they read improves with increased vocabulary. Iraqi pupils struggle to retain the language they learn because they lack certain essential skills that make it easier for them to remember the information. As a matter of fact, their vocabulary achievement falls short of expectations (Al-Bazzaz, 2005: 1).

1.2. Aim

The purpose of this study is to determine how brain-based learning theory might help Iraqi EFL students improve their vocabulary acquisition in secondary school.

1.3. Hypothesis

It is hypothesized that there is no statistically significant differences at ($\alpha \leq 0.05$) between the mean scores of the experimental group who is taught vocabulary acquisition according to brain-based leaning theory and that of the control group who is taught vocabulary acquisition according to the traditional way, in the post test.

1.4.Limits

It is limited to the 4th secondary school female students in Al-aadnanyia secondary school for girls in Baaquba City, for the academic year 2023-2024.

1.5. Definitions of Basic Terms

Brain-Based Learning (BBL): is a student-centered learning method that considers the many learning methods that students choose while making use of the entire brain. In order to promote effective and long-lasting learning, it considers the

individual variances among students (Kinach, 2010) and places greater emphasis on "how" learning occurs than "what" is learned. Learning becomes more engaging and contextual when the environment is set up to support each learner's processing of information and production of knowledge in accordance with their unique skills and distinctions.

Vocabulary: Ur (1994: 60) characterizes vocabulary, it is terms taught in the target language. Furthermore, according to Brown (2001: 132), vocabulary items are just a dull list of terms that students need to learn and commit to memory. In contrast, lexical forms are recognized as playing a crucial part in contextualized, meaningful language. Schemitt (1997: 231) adds that understanding a word's meaning also entails understanding its frequency of occurrence, company it keeps, suitability in various contexts, syntactical behavior, fundamental form and derivations, word linkages, and semantic characteristics.

2.1.Theoretical Background

In order to facilitate the application of brain-based learning theory, proponents of the technique, Caine and Caeine (2000:23), established twelve fundamental truths that serve as a roadmap for the brain-based learning methodology. The guiding ideas consist of:

- 1- Learning is physiological,
- 2- The brain and mind are social,
3. The need for purpose is intrinsic,
4. The process of "patterning" is used to look for significance,
5. The brain/mind processes wholes and pieces concurrently,
6. emotions are essential to patterning;
7. learning requires both focused attention and peripheral awareness;
8. There are always conscious and unconscious processes involved in learning.
9. Education is a lifelong process.
10. When knowledge and abilities are ingrained in innate spatial memory, the brain recognizes and retains them.
11. Threats and difficulties both promote and hinder learning.
12. Each brain is structured differently.

Furthermore, there are a number of instructional environments for learning as showed below:

- **Orchestrated Immersion:** This entails making sure that students focus on the material being taught; educators should connect concepts to events in real life, and students must use their memory to study content that is characterized by general and correlative native knowledge (Caine & Caiene, 2002:231). Field tours can help bring abstract concepts in economics, such as production, location, and localization of industry, to life by emulating real-world situations.
- **Relaxed Alertness:** This entails eradicating all forms of fear in the students while maintaining extremely demanding surroundings. In order to take a chance, learners need feel confident, according to this ideal state of mind (Caine & Caine, 2011:21). As a result, educators must set up the classroom to guarantee that all forms of fear are eliminated (Thomas & Swamy, 2014). Presentations of lessons can be made visually appealing or musically engaging.
- **Active Processing:** To process the information, this means allowing the pupil to absorb and synthesize it. Duman (2010:22) posits that pupils possessing active brains make eloquent connections between new information and preexisting knowledge through memory effort. To generate opportunities for contemplation and connection, teachers can accomplish this by allowing water intake, encouraging movement, and offering breaks throughout lessons (Caine & Caine, 2000). Academic success is enhanced by brain-based learning methodologies because they activate the brain's entire structure for optimal functioning. According to research in neuroscience, every brain is wired uniquely, just like every fingerprint is unique (Jancke, 2018). Everybody has a brain that can see patterns, memorize information, make mistakes on its own, gain knowledge, and learn from experiences. Thus, learning will happen organically as long as the brain is allowed to carry out its regular functions (Wilson, 2018).

2.2. The Importance of Vocabulary

For those studying English as a second language or as a foreign language, expanding their vocabulary is crucial. Cooper and Kiger (2009:473) emphasize that expanding one's vocabulary is essential to reading comprehension and competency, which are closely related. It is also a significant component in acquiring a second language and achieving academic success. Furthermore, according to Bender (2013: 88), developing particular behaviors “is the foundation for language learning. It is obvious that expanding the meaning of the word is just as significant as its frequent usage because this entails the correlation of symbols and their meaning”. Furthermore, four steps are involved in the process of learning vocabulary, according to Basu (2004:15):

- a. **Discrimination:** This is the first step. It entails the capacity to maintain their distinction when speaking and writing as well as the capability to discern sounds and letters from those adjacent to them as well as from the sounds and letters of words that are identical when reading and listening. As we'll see later, a common cause of inaccuracy is a lack of discrimination.
- b. **Understanding meaning:** This entails comprehending the meaning of the foreign term or expression. This is usually easy because there is an English counterpart for the term or because the word can be associated with its referent straightly.
- c. **Remembering:** Ensuring the retention of newly introduced and explained material is the next step. After students understand a word, they are no longer need to pay attention to it and will likely forget it.
- d. **Consolidation and extension of meaning:** If the student learn new words were that simple, and if the only factor that mattered was how they were presented, words wouldn't get lost and need to be learnt again. As it stands, though, it appears that words are taken in gradually over time, and that they only fully integrate into the learner's own vocabulary when he is able to employ them with the same level of fluency as he does in his home tongue Eder (2006: 22).

3.1. Methodology and Procedures

The Experimental Design

To ascertain whether the outcomes will be legitimate, impartial, and accurate, a suitable design must be selected. The current study employs the pretest and posttest non-equivalent groups design as its experimental strategy to accomplish its goal. Furthermore, according to Krysik and Finn (2013: 23), one of the popular quasi-experimental designs in educational research is this kind of experimental design.

There is less chance of assignment bias with this arrangement. A posttest is given at the conclusion of the treatment period, while a pretest was given prior to the experimental and control groups, treatments being administered. Before the two groups receive the treatment, the pretest was designed to enable the researcher to determine whether they are equivalent on the dependent variables. (See Table 1).

Table (1) the Experimental Design

Groups	Test	Treatment	Test
Experiment group	Pretest	brain—based learning theory	Posttest
Control group	Pretest	Traditional technique	Posttest

3.2. Population and Sample

All fourth secondary students registered in the first semester of the academic year (2023–2024) in the government schools in Diyala, Iraq, make up the study's population. For the academic year 2023–2024, a sample of eighty-four female pupils is selected from the Al-aadnanyia Secondary School for Girls in Baaquba City. The portions were selected at random. Section A and Section B are the two sections of this school. These sections are filled with pupils at random. There are (45) pupils in Section A and (44), in Section B. There are eighty-four students in all. The experimental group (EG) is designated as Section A, and the control group (CG) is designated as Section B. Since they have previously repeated a year, two students from A and three from B have been disqualified from the experiment. Throughout the experiment, the repeaters are maintained in their classes. As a result, there are a total of 84 pupils in the sample; 43 are in the

EG and 41 are in the CG. In addition, the sample is drawn from the same school in order to represent parents' social, cultural, economic, and intellectual levels as equivalents.

Table (2) The Number of Sample before and after Excluding the Repeaters

Group	Section	No.	Repeaters	Final no.
EG	A	45	2	43
CG	B	44	3	41

3.3. Teaching Material

The teaching material consisted of:

- 1- “Unit two (vocabulary: adjectives and its opposites)”
- 2- Unit three: “The weather (Island experiment)”

3.4. The Students' Achievement on the Pretest

The mean pretest scores of the EG and CG have been compared using an independent t-test procedure. The mean score of the EG was 29.769, whereas the mean score of the CG was 31.231, as indicated in Table (3). The computed t-value, which was determined to be 0.351 at 79 degrees of freedom and 0.05 level of significance, shows that the pretest scores of the two groups do not differ statistically significantly. This attests to the fact that the individuals allocated to EG and CG are initially similar rather than distinct.

Table (3) The Mean score, SD. and T-value of the student`s achievement on the Pretest.

Group	No.	M	SD	df	T-value		Level of significance
					Calculated	Tabulated	
EG	42	29.769	20.743	79	0.351	2.00	0.05
CG	45	31.231	22.363				

3.5. Validity and Reliability of the Tests

According to Brown (2004: 26), a test is considered valid if it measures what it is intended to measure, and it has face validity if it appears to be measuring what it was intended to measure. The tests were presented to a panel of teaching staff members from secondary schools and universities to verify the face and content validity of the assessments. The jury concluded that the exams' face and content were legitimate.

Reliability, is concerned with the consistency of scores for the same individuals, comes in second to validity. Therefore, the degree of consistency between two measures of the same test can be used to define dependability. It is the degree to which test results consistently reflect what they are intended to reflect (Mehrens and Lehmann, 1991:249). Accordingly, the test is deemed reliable if the participants' scores are constant and steady; nevertheless, if the scores frequently change for any cause, the test is deemed unreliable (Lado, 1961:312).

The reliability coefficient of the test has been computed by Kuder Richardson-20 Formula, where the reliability coefficient is found out to be 0.86.

3.6. The Experiment Application

The experiment ran from November 2, 2023, to January 3, 2024. Eight weeks passed during the experiment. Lessons were planned with both groups in mind. While the students have equal learning chances, the same instructional material was selected for both groups. Stated differently, the two groups' students are under identical conditions with one exception: the EG students are taught vocabulary acquisition with the use of brain-based learning theory, while the CG students are taught vocabulary acquisition through the use of the traditional technique. The investigator created two standard plans: one based on the Emoji and Emoticons technique for the experimental group and another adapted from the Iraq Opportunities teacher's guide for the control group (book 8). Additionally, the researcher spoke with EFL teaching specialists as well as the English instructors at the secondary school where the experiment was carried out regarding the lesson plans. The preparation stage, the execution stage, and the post stage were the three primary phases of the data collection procedure.

* **Preparation stage:** In order to determine the participants' starting position before to the start of therapy, a pre-test using an earlier version of the instrument was conducted. The lesson plan created using the three conditions of learning (active processing, coordinated immersion, and relaxed alertness) and the twelve

principles of brain-based learning theory served as the experiment's treatment instrument. To ensure consistency in the way the lessons were presented to the groups, the researcher created lesson plans for the two groups. Based on the ideas of brain-based learning techniques, the researcher created the following teacher's recommendations for the study (BBLs).

* Teachers informed pupils in the first session about the significance of eating for physical development and the need for water consumption for optimal brain health.

* Students were urged to consider their prior knowledge. Instructors provided a stimulating environment by, among other things, playing classical or gentle music occasionally, creating a happy atmosphere using brainteasers, and telling jokes devoid of sarcasm.

* Students' self-esteem was much increased when teachers complimented them or added positive adjectives to their names. Some examples of these include Intelligent Ward, Smart Jana, Charming Malak, and Beautiful Judy.

* Using a variety of criteria, including birth months, first alphabet of name, number of siblings, etc., classes were divided into groups. This was done to promote learning and peer interaction. After participating in role plays, projects, and group discussions, the students were free to assess one another without receiving negative feedback.

* Instructors encouraged students to openly share their worries, questions, and thoughts about each module or topic they were studying.

* Teachers created welcoming environments by promoting laughter and smiles, as well as by being approachable with their kids and getting them moving.

* Teachers facilitated students' establishment of personal learning patterns by asking thought-provoking questions and providing opportunities for introspection on newly acquired knowledge. This integrated new concepts with preexisting ones to foster critical thinking and the presentation of important contents.

In order to get the pupils ready for the class, the teacher asks some opening questions and assigns some activities. In order to connect the previously learned content with the new subject matter, the teacher assists students in retrieving information from their own experiences. This crucial step helps students focus and close the learning gap by drawing on their existing knowledge and assimilating the new information. Such instructional phases were employed by the researcher to gauge and assess the amount of language repertoire that students had acquired in prior years related to the subject matter. During the class planning stage, the researcher ascertained the prior knowledge of the students regarding the terminology in the subject matter, frequently by means of brainstorming sessions or hands-on experiences to be presented and practised.

Implementation stage.

1. Teacher Provides Data: During the warm-up phase, the teacher assists students in activating their existing knowledge, which helps to get them ready for the new material.
2. The teacher goes over the preceding vocabulary and organization.
3. To introduce new terminology, the teacher shows a movie about amines (sound and picture).
4. Students accurately pronounce and repeat the vocabulary.
5. Students mimic the organization and vocabulary.

Post stage: Researchers currently have two stages. The assessment comes first. Students assess their performance throughout the lesson's evaluation phase in order to comprehend the material they have studied. Activities for evaluation might be teacher-directed, collaborative, or independent. Therefore, the goal of this step is to instill confidence in the students and ensure that they fully comprehend and utilize the chosen language in everyday English. The expansion is the second stage. During the lesson's expansion phase, students are provided with multiple opportunities to consider the newly acquired vocabulary, incorporate it into their pre-existing

knowledge frameworks, apply it in real-world scenarios, and further refine their academic language skills. “This phase also provides the opportunity to exercise vocabulary acquisition through using certain technique”.

3.7. The pre-test & the posttest and its Scoring Scheme

To confirm that the samples' prior proficiency in the English language is comparable. There has been a pre-accomplishment test used. The T-test is used to collect and statistically assess the individuals' results. The exam is worth 100 points, which are divided as follows:

Table (4) the Analytical Scoring Scheme for Vocabulary Acquisition

Remembering 12 marks	understanding 12 marks	Applying 12 marks	Analyzing 12marks	Creating 12 marks	Total
Recall or retrieve previous learned information .	“Comprehending the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words”.	“Use a concept in a new situation or unprompted use of an abstraction. Applies what was learned in the classroom into novel situations in the work place”	“Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences”	Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.	60 marks

3.8. Construction of the Achievement Post-Test

Similar to progress exams, achievement tests are administered at the conclusion of the course. According to Anderson et al. (1995: 286), the course syllabus or textbook typically serves as the basis for the content of both progress and accomplishment examinations. The purpose of the achievement test in this study is to compare the vocabulary acquisition achievement of the experimental group's learners to that of the control group's subjects who also had exposure to brain-based learning theory in order to determine the effect of applying this theory. Many resources were used in the test's design, including the researchers' personal experiences, reviews of relevant

literature, and consultations with supervisors and seasoned educators.

Table (5) Comparison of Posttest Achievement Scores of the Learners` in the Experiment and the Control Groups

Group	No.	M	SD	df	T-value		Level of significance
					Calculated	Tabulated	
EG	43	37.109	26.345	79	5.879	2.00	0.05
CG	41	31.001	20.265				

The mean score and standard deviation of each group's prior English learning are displayed in Table (5). The examination of the data shows that, at the (0.05) level, there are statistically significant differences between the experimental and control groups.

4.1. Results

Table (5) indicates that the experimental group's post-test mean score was 37.109, while the control group's score was 31.001. With a degree of freedom of 79 and a threshold of significance of 0.05, the computed t-value of 5.879, which is greater than the t-table value of 2.00, is discovered using the t-test for two independent samples. This indicates that the experimental group has benefited from a statistically significant difference in the two mean scores. Consequently, the study's goal has been met, and the null hypothesis is disproved. Thus, an alternative hypothesis is adopted which proposes, “that there is a statistically significant difference between the experimental group, who is taught according to BBLT activities and the control group who is taught according to the traditional method on students' vocabulary acquisition”.

4.2. Conclusions

In the light of the results obtained, the following conclusions can be drawn:

1. Iraqi secondary school students can be considered rather poor when it comes to vocabulary knowledge, as shown in their achievement in the pre-test.
2. The traditional techniques used in teaching vocabulary in Iraqi secondary classes are effective, as the results of the control group had shown on the pre-test and the post-tests. However, the technique employed by the researcher, was proven to be more fruitful and effective in promoting the students' vocabulary acquisition.

There are several great reasons for using brain—based learning theory as vocabulary acquisition prompts:

3. Since brain—based learning theory a student-centered learning approach that utilizes the whole brain and considers the different learning styles preferred by the students. It takes care of students' individual differences for effective and lasting learning, they can be used with students of any age, language, or reading ability.

References

1. Al-Bazzaz, A. H. (2005). *"Investigating the Impact of Vocabulary Instruction on Developing Reading Comprehension"*. Unpublished M. A. Thesis, University of Tikrit.
2. AL-khazaly, Husam , (2013), *"the application of certain techniques for promote Iraqi EFL students' vocabulary storage and long-term retention"*. Unpublished M.A. Thesis, Al-Mustansiriya University.
3. Basu, R. (2004). *Implementing Quality: A Practical Guide to Tools and Techniques*. New York: Cengage Learning.
4. Bender, M. (2013). *Academic Vocabulary and Reading Comprehension*. New York: Cengage Learning.
5. Brown, H. D. (2001). *Teaching by Principles: An Interactive Approach to Language Pedagogy*. New-York: Longman.

6. Caine, G., & Caine, R. N. (1999). *Making connections: Teaching and the human brain*. Alexandria, Virginia, Association for Supervision and Curriculum Development.
7. Caine, G., & Caine, R. N. (2000). *The learning community as a foundation for developing teacher leaders*. NASSP Bulletin, 84, (616), 27-34.
8. Caine, G., & Caine, R. N. (2002). *Making connections: Teaching and the human brain*. Menlo Park, CA: Addison-Wesley.
9. Cooper, J. D. and Kiger, N. D. (2009). *Literacy: Helping Students Construct Meaning (7th ed.)*. Boston: Houghton Mifflin Company.
10. Duman, B. (2010). *The effects of brain-based learning on the Academic Achievement of students with different learning styles*. Eric Journal of Education Sciences, 10 (4), 2077-2103.
11. Eder, K. (2006). *Vocabulary Learning Strategies*. Berlin: Grin Verlag Publishing.
12. Gatti, W. J. (2004). *"The Effect of Developing Iraqi Learners' EFL Vocabulary Repertoire Through Semantic Relations on Their Reading Comprehension Ability"*. Unpublished M.A. Thesis, Al-Mustansiriya University.
13. Hans, V. (2018, May 21). *Study of the day: mild dehydration alters mood, makes thinking hard*. The Atlantic. Retrieved on 20/07/2019 from <https://www.theatlantic.com/health/archive/2012/02/...dehydrati.../ 253320/>
14. Immordino-Yang, M. (2011). *Implications of affective and social neuroscience for educational theory*. Educational Philosophy and Theory, 43 (1), 98-103.
15. Jancke, L. (2018). *Every individual has a unique brain anatomy, study reveals*. Retrieved on 20/07/2019 from <https://neurosciencenews.com/uniquebrain-anatomy-9541>
16. Kinach, B. M. (2010). *A review of "how the brain learns Mathematics*. The Journal of Educational Research, 103:5, 368-369.

17. Krysik, J. L. and Finn, J. (2013). *Research for Effective Social Work Practice (3rd ed.)*. New York: Routledge Publishing.
18. Lado, R. (1961). *Language testing: The construction and use of foreign language tests: A teacher's book*. Bristol, Inglaterra: Longmans, Green and Company.
19. Mehrens, W. A., & Lehmann, I. J. (1991). *Measurement and evaluation in education and psychology (2nd ed.)*. New York, NY: Houghton Mifflin Company.
20. Schmitt, N. (1997). *Vocabulary learning strategies*. In N. Schmitt, & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (Vol. 2035, pp. 199-227). Cambridge, England: Cambridge University Press.
21. Stevens, J. & Goldberg, D. (2001). *For the learners' sake*. Tucson, Zephyr Press.
22. Thomas, B. M. & Swamy, S. S. (2014). Brain-based teaching approach—A new paradigm of teaching. *International Journal of Education and Psychological Research*. 3 (2), 62-65.
23. Thornbury, S. (2002). *How to Teach Vocabulary*. Harlow: Longman.
24. Ur, P. (1996). *A Course in Language Teaching*. Cambridge: CUP
25. Wilson, L. O. (2018, October 2). *The Brain-based education - An overview- The second principle*. Retrieved on 20/07/2019 www.thesecondprinciple.com/optimallearning/brainbasededucation-anoverview.

Appendixes

A - Pre test

Q1/ A - match the words with their synonyms.

- | | |
|----------|-------------|
| 1. Test | a. panels |
| 2. Water | b. map |
| 3. Solar | c. industry |
| 4. Radar | d. samples |
| 5. Gas | e. tube |

B – Complete the sentences with correct words:

(fearless - colorful - impossible - friendless - useful)

- 1- Ali is -----, he isn't afraid of anything.
- 2- Parrots have very -----feathers.
- 3- This puzzle is ----- to finish.
- 4- He is alone and -----.
- 5- My bilingual dictionary is very -----.

Q2/ Join the beginnings and endings of the sentences:

- 1- A marine biologist studies A. the weather
- 2- A forester studies B. plants and animals in the sea.
- 3- he doesn't like giving C. exams
- 4- A meteorologist studies D. presentations
- 5- he hates taking E. trees

Q3/ Match the words with their synonyms.

- | | | | |
|------------|-------------|-----------|-----------|
| 1. Wedding | 2. seat | 3. answer | 4. desire |
| 5. shut | | | |
| a. Wish | b. reply | c. chair | d. |
| close | e. marriage | | |

Q4/ Do you dream a lot? What sort of dreams do you often have? What is the nicest (worst) dream you have ever had?

B- Posttest

Read the following passage carefully:

Jane's great passion in life was animals. She had dozens of books about them. The walls of her bedroom were covered with pictures of animals, just as other girls of her age had posters of popstars. She used to keep animals in the garden and, if she could, she brought them into the house too. Usually, however, her mother caught her. "Get those animals out of here!" she used to shout. 'If you must keep them, use the shed at the end of the garden!' Most of Jane's animals were quite small: rabbits, mice, birds - that sort of thing. But one day something quite big came her way.

Jane's mother noticed that she was spending quite a lot of time in the shed. She also noticed that food was disappearing from the house, especially bread and fruit. One evening she decided to go down to the shed to see for herself. As she stood outside the door of the shed, she could hear Jane talking to someone inside. "She's got a friend in there with her," she thought. She opened the door and looked in. At first, she could only see Jane sitting on the ground. Then she made out the shape of an animal sitting beside Jane. Two huge eyes stared up at her. She nearly screamed; it was a gorilla! "Jane! Where on earth... ?" she started to say. But then she remembered. A few days before, a young gorilla escaped from the zoo and, in spite of every effort to find it, the animal simply vanished. "I found it wandering through the park," Jane explained. "It seemed so lonely! I talked to it and we became friends at once. And then it followed me back here..." "Well, you know you can't keep it," her mother said. "You'd better phone the police and explain." Not long after, the police came and also a van from the zoo. Nobody was even angry with Jane when she told her story. The police knew all about Jane and her animals. And the zookeeper said: "I can see that Gor likes you. But we need him back at the zoo! But you can come and see him as often as you like. Well send you a free pass!" These days Jane has almost given up collecting small animals — but you can often find her talking to her friend Gor at the zoo!

Q1/A Find these words in the text:

shed ; disappearing ; shape; screamed ; simply ; lonely .

Now choose the right meaning

1. just
2. gave a loud cry
3. hut
4. unhappy because it was alone
5. form
6. going

B - Give the words or phrases for these pronouns.

- 1 . Jane had pictures of animals *there*.
- 2 . Jane kept animals *there*.
- 3 . Jane found the gorilla *there*,
- 4 . The police went *there*.
- 5 . Jane often goes *there* these days.

C. Right or wrong?

- 1 . Jane kept animals in her bedroom.
- 2 . Jane took a lot of fruit from the house.
- 3 . Jane wasn't afraid of the gorilla.
- 4 . It was in Jane's shed.
- 5 . She tried to bring animals into the house.
- 6 . She needed it for the gorilla.
- 7 . She had to tell them about the gorilla.
- 8 . She had a gorilla there.

Q 2/ Full in the plank

(calcium , diet , calories , impossible , useful , important)

1. Food with a lot of ----- can make people fat.
2. ----- is needed for healthy teeth and bones.
3. ----- means the food people regularly eat.
4. My bilingual dictionary is very-----.
5. Chemistry is an ----- subject to study.

Q3/ Join the beginnings and endings of the sentences :

- | | |
|--|------------------|
| 1- A marine biologist studies | A. the weather |
| 2- A forester studies
animals in the sea. | B. plants and |
| 3- he doesn't like giving | c. exams |
| 4- A meteorologist studies | d. presentations |
| 5-he hates taking | e. trees |