

## **The Effect of Brain-Based Strategies on Developing Iraqi EFL Preparatory Pupils' E-Learning**

Prof. Dr. Madeha Saifaddin Saleh  
Sahar Azzam Neamah

Collage of Education for Women, Tikrit University

### **Abstract**

Brain-based strategies are a way of activate all parts of the brain during the learning process. Therefore, brain-based strategies are implemented to increase pupils' engagement and then develop pupils' e-learning. This study aimed to investigate the effects of brain-based strategies on developing Iraqi EFL preparatory pupils' e-learning and investigate the effect of brain-based strategies on enhancing the pupils' attitude towards e-learning. The study was conducted using a quasi-experimental design case study. The participants of the study were (70) pupils of the fourth stage of the academic year 2019-2020 derived from two schools divided into two groups: one an experimental group and the other a control group . A test and questionnaire were designed to confirm the study's validity and reliability. SPSS was used to analyze the data. The findings revealed that there were statistically significant differences between the experimental and the control groups, in favor of the experimental group. Encouraging results had been obtained when analyze the data, the teaching brain-based strategies is one beneficial teaching strategy on developing pupils' e-learning. This strategies can make learning more active and engaging and it improves pupils' e-learning . Accordingly, the post-test

that is administered at the end of the experiment indicates a significant difference in the pupils' e-learning positively.

**Key Words :** Brain-based strategies , e-learning , attitudes .

## Introduction

The current study utilizes the brain-based strategies in order to develop the use of the e-learning in classrooms and to make greater retention of information in long term memory and recall as well as to enhance pupils' attitudes .

Technology has progressed significantly and there have been developments in many areas , but classrooms in schools have not been affected . The method of presentation of the curriculum is not compatible with the current era and is free from any means to attract the pupils and motivate him to learn while competing means of technology outside the class to attract the attention of the pupils.

## Literature Review

### The Concept of Brain-based Strategies

Fogarty (2009:239) claims that Brain-based learning is an approach incorporates 12 principles which are derived from a synthesis of research-based information on how the brain works and on learning . The approach is described as engaging strategies that are governed by principles related to the comprehension of how the brain works. Brain based learning emphasizes on how the brain takes in information and emphasizes the different processes involved in learning. The focus on what each part of the brain does, allows

pupils to connect to their learning and how they receive, perceive and act on their learning.

The same idea is expressed by Connell (2009: 28) says that a more important aspect of brain based learning theory is that it involves the application of research based strategies and interventions within the field of education.

Caine et al. (1995:52) assert that the association of brain research and learning is meant to help maximize the brain's natural learning processes and achieve meaningful lifelong learning. Caine et al. (1995:43) focus on learning in a meaningful way as opposed to a more traditional approach of memorization of facts.

### **The Caine's Model 2003 of Brain-Based Strategies**

The components of brain-based Strategies as mentions them as follows :

#### **1- Talking**

Sousa (2006:134) suggests that pupils who deliver information to their peers retain 90% of the information, as opposed to retaining only 5% of what is delivered in a lecture format from the teacher or discussion to the lecture after a 24 hour period. Ramakrishnan (2013:238) illustrates that the talking internalizes what the pupils' learned through turn and talk time .

#### **2- Emotion**

Jensen (2005:49) stats that it is important to celebrate pupils achievement to contribute to the positive emotional climate of a classroom.

#### **3- Visuals**

Siercks (2012:62) claims that brain-based education can be through various visual aids. By considering the different learning styles of pupils, teachers are able to determine which brain-based strategies work best for all pupils. Jensen (2008:56) asserts that 90 % of the sensory input to the brain is from visual sources.

#### **4- Chunking**

Philp (2007:54) argues that patterning connects the chunks of information into organized groups instead of isolated pieces of information that have little meaning to the learner. Pupils move from one class to the next without any connections being made. Therefore, pupils find what is taught in each separate class meaningless and lacking impact on their long-term memory.

#### **5- Movement**

Arzy (2013:40) mentions that physical and kinesthetic activities in the classroom help pupils connect concepts to movement and thus them helps to visualize the processes and outcomes to create better understanding. A brain compatible classroom is one where subject matter is woven with physical activity.

#### **6- Brain breaks**

Nunley (2003:37) states that working memory does not hold on to new information very well because of the lack of coding. In order for memories to stick they must move to the hippocampus, the part of the brain that forms, organizes, and stores memories. Sousa (2006:97) claims that if information is received so quickly or there is too much, it will not be stored in memory. It is imperative that teachers take a break in the learning to make information stick.

Jensen (2005:176) recommends the following teacher actions: repeat and review often, increase oral group responses, and allow for brain breaks or time-off-task to offer opportunities for the information to be seated in long-term memory and retained. Jensen also suggests small breaks for stretches, roleplaying or charades, and quick games like a ball toss for review.

3

## 7- Make connection

Kaufeldt (1999:73) recommends bringing in current ideas and events into the lesson to help pupils make connections. Currently, teachers can use multimedia, such as digital, and laptop computers to provide access to videos, and lectures to bring current events into the classroom.

## 8- Feedback

Sousa (2009:36) claims that a key contributor to pupils' positive emotions and motivations is feedback; pupils have a need to feel valued, and positive feedback is one way to fill that need. When a pupil is given even the smallest amount of feedback, the brain provides the learner with the correct information to be used in the future. Teachers can help pupils by coaching, facilitating, and offering authentic feedback.

Arzy (2013:40) mentions that pupils need to hear encouraging words on how to make their work better. Pupils need specific feedback to make the proper adjustments in their work and to know what is expected of their finished product.

## The Concept of E-Learning

Arkorful (2014:397) notes that e-learning , as a concept , encompasses a wide range of learning programs and methods. It also means using of information and communication technologies in a variety of training processes in education to support and enhance learning and it includes the use of information and communication technology as a supplement to traditional classrooms, online learning or a combination of the two.

## Related Previous Studies

### Maynard's Study (2016)

The aim of this study is to investigate the effects of a brain based self-advocacy program on student's use and recognition of self-advocacy skills .

The study hypothesized that :

1. How do elementary school teachers use what they know about the brain to plan lessons and teach students?
2. How do teachers understand brain-based learning?
3. How are teachers applying their knowledge of brain-based teaching in their classrooms?
4. What do teachers find beneficial or difficult about applying brain-based instruction in their classrooms?

The sample of the study consists of (34) students that participated in the self-advocacy program in an independent school in the Philadelphia suburbs. In order to achieve the aim , the data includes student, teacher, and program facilitator pre and post program questionnaire responses. The questionnaires

are asked about students' knowledge of self-advocacy and self-advocacy strategies, as well as student perceptions about themselves as learners. The questionnaire is designed specifically for self-advocacy program. Each student, the teacher and the psychologist who serves as program facilitator completed the questionnaire pre and post intervention. The data analysis finds out that students increase their knowledge and understanding of self-advocacy in post program. This is the only hypothesis that is found to show a statistically significant result, positive change from pre to post program.

### **The problem of the study**

Recently, the researcher finds that the problem in Iraqi EFL pupils that there is no mean attract them to learn inside the classroom . Therefore , the researcher finds there is a need to make pupils use technology which became necessary today to develop pupils' e-learning and enhance their attitude towards e-learning . In addition to that the problem in Iraqi EFL pupils' memory that they remember very hard what they have memorized whereas they remember every scene they see . This means that pupils have a problem in retention of information . For this reason, the researcher finds there is a need to motivate pupils' cognitive ability through visual information through adopting brain-based strategies.

### **Aims of the study :**

- 1- Investigating the effect of brain-based strategies on developing Iraqi EFL preparatory pupils' e-Learning.
- 2- Investigating the effect of brain-based strategies on enhancing the pupils' attitude towards e-learning.

### **Hypothesis of the study :**

1. There is no statistical significant difference between the mean scores of the experimental group which is taught by brain-based strategies and the control group which is taught by the traditional strategy in e-learning posttest.
2. There is no statistical significant difference between the mean scores in post-test of the experimental and control group in enhancing attitude.
3. There is no statistically significant difference between the mean scores of the experimental group in e-learning pre and its mean scores in post test.

### **Methods and Procedure**

The study used a quasi-experimental design with pre-post-test and pre-post-questionnaire for two groups. The experiment has lasted for eight weeks. The lessons have been organized for two groups as two hours per-week .The sample of the study was selected (35) pupils who were randomly placed in an experimental group and a control group. Both groups took the pre-test to equalize them and to ensure that the experimental and control groups of pupils were similar with regard to their academic ability. The pre-post questionnaire is applied on the experimental and control group at different times . The questionnaire is administered to explore the pupils' attitudes towards the brain-based strategies on enhancing e-learning .

### **Analysis of the Collected Data :**

#### **Result Related to the First Aim**

To achieve the first aim of this study, the finding results of the statistical analysis by using t-test for two independent groups have shown that the mean value of brain-based strategies on development level of the control group is



(71.11) with a standard deviation of (14.53) while the mean value of the experimental group is (84.43) with a standard deviation of (11.87).

In order to find out differences between the mean score of the two groups t-test formula for two independent groups has been used. The computed t-value is (4.20) which is higher than the tabulated t-test value which is (2.00) at the level of significance of (0.05) and a degree of freedom (68). As shown in Table (1) below:

**Table (1)**  
**The Experimental and Control Groups in the Post-Test**

Group	No.	Mean	S.D	T-value		D.F	L.S
				Computed T-value	Tabulated T-value		
Experimental	35	84.43	11.87	4.20	2.00	D.F	L.S
Control	35	71.11	14.53			68	0.05

This means that there are statistically significant differences between the experimental group which has been exposed to the teaching brain-based strategies and the control one which has not been exposed to teaching brain-based strategies in favor of the experimental group.

Therefore, the null hypothesis is rejected and an alternative hypothesis is stated that there are statistical significant differences between the scores of the experimental group which has been exposed to the brain-based strategies and the control group which has been exposed to the traditional strategy in their developing e-learning and in favor of the experimental group.

To test the hypothesis, there is no statistically significant difference between the mean scores of the experimental group in pre and its mean scores in post test , the pupils' pretest and posttest results are compared to show how much pupils take benefit from brain-based strategies on developing e-learning .

The results of the statistical analysis by using t-test formula for independent group has shown that the mean value for pretest brain-based strategies on development level of the experimental group is (70.54) with a standard deviation of (14.57) while the mean value of the posttest of the experimental group is (84.43) with a standard deviation of (11.87).

The computed t-value is (8.02) which is higher than the tabulated t-test value which is (2.04) at the level of significance of (0.05) and a degree of freedom (34). This means that there are statistically significant difference between the mean scores of the experimental group in pre and its mean scores in post test.

Therefore, the null hypothesis is rejected and an alternative hypothesis is stated that there are statistical significant differences between the mean scores of the experimental group in pre and its mean scores in post test which has

been exposed to the brain-based strategies in developing e-learning. As shown in Table (2) below:

**Table (2)**

**The Experimental Group in the Pre-Post-Test**

Group	Mean	S.D	T-value		D.F	L.S
			Computed T-value	Tabulated T-value		
Pre	70.54	14.57	8.02	2.04	D.F	L.S
Post	84.43	11.87			34	0.05

**Result Related to the Second Aim**

In order to achieve the second aim , the questionnaire of pupils' attitudes towards e-learning is applied to the experimental and control groups aims at finding out their attitudes towards brain-based applications in the course of enhancing e-learning. The questionnaire requires the pupils to react to a series of statements. The pupils react to the items successfully.

The obtained results of applying t-test value for two paired samples indicate that there are statistically significant differences between the mean scores in the post-test of the experimental and control group are as follows:

The computed t-value in experimental group is (13.81) and the tabulated t-value is (2.00) with the degree of freedom of (68). Since the computed t-value is higher than the tabulated t-value, the difference between the mean scores is significant at the level of (0.05).

Therefore, the null hypothesis is rejected and an alternative hypothesis is stated that there are statistically significant differences between the mean scores in the post-test of the experimental and control group in enhancing the pupils' attitude towards e-Learning . As shown in Table ( 3 ) below:

**Table ( 3 )**

**The Experimental Group and Control Group in the Post-Questionnaire**

Group	Mean	S.D	T-value		D.F	L.S
			Computed	Tabulated		
Experimental	17.86	1.54	13.81	2.00	68	0.05
Control	13.83	0.79				

**Pupils' Attitudes' Questionnaire Toward E-Learning**

The questionnaire is concerned with measuring the pupils' attitudes toward brain-based strategies application in the course of enhancing e-learning of the subjects' brain-based strategies. The weighted mean (W.M) and weighted percentile (W.P) of the subject's responses on each item of the questionnaire as shown in Table (4) .

The items of subjects' of the pupils' attitudes toward e-learning are chosen to be related in one way or another with the model of this study through the items of the pupils' attitudes questionnaire, it measures pupils' reaction to the questionnaire and focusing on some aspects in their learning.

After ranking the items according to the value of the weighted mean and weighted percentile, it has been found that the highest rating W.M (0.94); W.P (94.28%) No.21 *I felt positively challenged because activities that required the use of computer, smart devices and smart board in the classroom.* Using smart devices in the classroom evoke pupils' interest in learning, increase pupils' motivation and create challenged environment. Making blending between technology and course material led to create a positive competitive environment , increase the pupils' engagement , and make pupils more active in the classroom.

While the lowest rating W.M (0.54), W.P (54.28 %) belongs to item No. (17) *I felt alert in the lessons because they were scheduled between 9:00 a.m and 13:00 p.m .* The item indicates that pupils are not well satisfied because their lessons are scheduled between 12:30 p.m. and 15:30 p.m. It is importance to schedule the lessons between 9:00a.m and 13:00p.m. Therefore , if the teachers want to maintain the pupils' attention and to become a better effective mentor , the administration should take this point into consideration.

**Table (4)**

**Subjects' of the pupils' attitudes toward e-Learning for Experimental Group**

No.	Item	W.m	W.p
21.	I felt positively challenged because activities that required the use of computer, smart devices and smart board in the classroom.	0.97	97.14
4.	I could recall information more readily because the environment provided as much visual, auditory, and sensory as possible .	0.94	94.28
12.	I felt comfortable and motivated because the teacher was accepting and non-threatening while interacting with us.	0.94	94.28
22.	I felt motivated because the learning was a process of creative construction and it involved trial and errors (e.g., games and contests).	0.91	91.42
2.	I liked seeing materials such as video, pictures in the classroom which reflected the topic and the language being studied .	0.91	91.42

7.	I liked actively participating in the educational process through interactive, creative, cooperative and collaborative learning situations.	0.85	85.71
13.	I felt relaxed because we exercised peer support and physical movement in the classroom.	0.85	85.71
10.	Learning was fun because there was mutual love, caring and respect between the teacher and us.	0.82	82.85
14.	Learning was fun because the teacher provided opportunities for our expression and engagement of emotions through various classroom activities (such as: collaboration and team / pair work).	0.82	82.85

23.	I liked to use the language grammar structures meaningfully and appropriately in the lessons (such as: PowerPoint) .	0.82	82.85
26.	I liked the assessment techniques because they encouraged me to reflect on my performance and progress.	0.82	82.85
6.	I felt relaxed because the teacher employed various strategies to attract our individual interests	0.80	80.11
15.	I felt confident to participate in all the activities including games and contests.	0.80	80.11
24.	I liked to design the course content from a theme-based so that interesting themes gave us a basis for understanding and acquiring new language structures and patterns.	0.77	77.14
9.	I felt responsible and motivated because the teacher employed empowering language and behavior towards me (e.g., You can do it).	0.77	77.14
11.	I enjoyed the lessons because the teacher provided well-planned lessons.	0.74	74.28
25.	Learning was fun because studying responding to and producing the course materials all led me to see the possibilities of new relationships between bits of information .	0.71	71.42
16.	I enjoyed learning because the teaching included variations and challenges in order to make me explore the material's deeply felt meaning.	0.68	68.57

8.	I felt relaxed because the teacher guided my learning, growth and development through her constructive feedback and her close observation of my progress.	0.65	65.71
20.	Learning was fun because the lessons reflected a natural connection to real-life experiences .	0.65	65.71
3.	I felt comfortable and receptive because the environment was an inviting and stimulating setting which included all the elements of pleasant sounds, various resources and working space.	0.62	62.85
17.	I enjoyed learning because the instruction involved various strategies to reach all intelligences (such as: teaching through bringing feeling into presentation) .	0.62	62.85
5.	I felt relaxed and alert because of the music that was played during classroom activities .	0.57	57.14
18.	I felt motivated because I participated in meaningful and challenging lessons that invoked my curiosity and search for meaning .	0.57	57.14
1.	Learning was fun because the environment was responsive (there were open, respectful and cooperative relationships)	0.54	54.28
17.	I felt alert in the lessons because they were scheduled between 9:00a.m and 13:00p.m .	0.54	54.28



## Discussion of Results

According to the obtained results of the test, in relation to the pupils in the preparatory level in scientific branch, it has been noticed that learning e-learning through brain-based strategies has an effect on the experimental group; that the calculated t-value which is found to be higher than the tabulated t-value.

Because, the experimental group exposed to modern technology tools that have an important effect on improving pupils' e-learning such as: smart board, tablets, mobiles and data show that helped pupils' learning.

The analysis of results in the current study provides support to the findings of the previous studies. It is found that there is a significant difference in the performance of subjects who have been exposed to teaching brain-based strategies as compared to the performance of those who are not exposed to traditional strategy.

It also indicates that there is improvement in the pupils' deeper understanding and greater retention of information then recall it easier. The results of present study concludes that brain-based strategies show better results than conventional method.

## Conclusions

1- The study concludes that the teaching brain-based strategies is one beneficial teaching strategy on developing pupils' e-learning. This strategies can make learning more active and engaging and it improves pupils' e-learning . Accordingly, the post-test that is administered at the end of the experiment

indicates a significant difference in the pupils' e-learning positively.

2- The achievement of the pupils of the experimental group is better than the pupils of the control group which indicates that those pupils have positively responded to the strategies , brain-based strategies are an effective strategy that stimulates pupils' creativity in learning and arise motivation by using technology Ipad , mobile and smart board.

3- Brain-based strategies should receive much attention because it has a significant role in retention , store and retrieval information.

4- Brain-based strategies raise the degree of cooperation among pupils and give them an opportunity to demonstrate their understanding of the topics.

5- This strategy reinforces the relationship between teacher and pupils and makes the teacher as a close friend who facilitates the process of learning .

6- The teacher should understand the educational background of his pupils in order to motivate pupils to learn English language.

7- Motivating pupils to exercise physical movement in the classroom and participate in all the activities including games and contests can active pupils' brain.

8- Providing as much visual, auditory, and sensory can help pupils' recall information more readily . Thus, make environment an inviting and stimulating setting.

9- Designing the course content by using PowerPoint to present interesting themes will support pupils a basis for understanding and learning new language structures and patterns.

10- Creating an activities through the classroom environments, that make pupils actively participate in the educational process through interactive, creative, competitive and collaborative learning situations.

11-Using modern technology in the classroom can build up pupils' cognitive and increase their engagement. Because practicing the required activities by using of computer, smart devices and smart board in the classroom.

12- The pupils have developed e-learning through preparing the computerized educational programs by the researcher for the topics of units and incorporated the activities within it to use e-learning in teaching the experimental group.

## **BIBLIOGRAPHY**

- Arkorful , V. and Abaidoo , N. (2014). "The Role of E-Learning, the Advantages and Disadvantages of its Adoption in Higher Education".

**International Journal of Education and Research** Vo. 2 (12), 397-410

- Arzy-Mitchell, Bree K., (2013). "Brain-Based Learning for Adolescent Science Students A Review of the Literature". Un-published M.A Thesis, United States. University of Wyoming.

- Caine, R., & Caine, G. (1995). "Reinventing schools through brain-based learning". **Educational Leadership**, Vo. 52 (7) , 43-47.

- Connell, J. D. (2009). "The Global Aspects of Brain-Based Learning".  
**Educational Horizons**, Vo.88 (1), 28-39.
- Fogarty, R. (2009). **Brain-Compatible Classrooms** (3rd ed.). Thousand Oaks, Calif: Corwin
- Jensen, E. (2005). **Teaching with the brain in mind** (2"d ed.). Alexandria, VA: ASCD.
- Jensen , E. (2008). **Brain Based Learning: The New Paradigm of Teaching** (2<sup>nd</sup> ed.). UK. London Corwin Press.
- Kaufeldt, M. (1999). **Begin with the Brain: Orchestrating the Learner-Centered Classroom** . (2<sup>nd</sup> ed.). UK. London . Corwin Press
- Maynard M., (2016). "Effect of a Brain Based Learning Program on Students' Use and Recognition of Self- Advocacy Skills" . Un-Published PH.D. Thesis. United States , Philadelphia College.
- Nunley, K. F. (2003). **A Student's Brain: The Parent/Teacher Manual**. Kearney, NE: Morris Publishing.
- Philp, R. (2007). **Engaging Tweens and Teens**. Thousand Oaks, CA: Corwin Press.
- Ramakrishnan, J. and Annakodi, R. (2013). "Brain Based Learning Strategies". **International Journal of Innovative Research & Studies**,. Vo.2 (5) , 236-242.
- Sousa, D. (2006). **How the Brain Learns** (3<sup>rd</sup> ed.). CA: Corwin Press.

- Sousa, D. (2009). Brain-friendly learning for teachers. **Educational Leadership**, Vo. 66 (9).
- Siercks, A. (2012). "Understanding and Achieving Brain-Based Instruction in the Elementary Classroom: a Qualitative Study of Strategies Used by Teachers". Un-Published M.A.Thesis. United States, University of Central Florida.