Using the Whole Brain Teaching Method to Develop 2nd Graders' EFL Vocabulary Learning and EFL Classroom Engagement

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Abstract

This research aims to investigate the effect of using the whole-brain teaching method on developing the 2nd-grade primary school pupils' vocabulary learning, and EFL classroom engagement. For this purpose, a quasi-experimental research methodology was utilized. Sixty pupils from Taha Hussien Primary School, EL-Minia Governorate were randomly selected and divided into two groups: the treatment group (n=30) that was taught using the WBT program and the non-treatment group (n=30) that was taught through the regular teaching methods. For data collection, the vocabulary learning test and the classroom engagement scale were administered to the study sample. Using suitable statistical methods, findings indicated the effectiveness of the proposed program using the WBT. There were statistically significant differences between the means of the scores of the treatment and non-treatment groups in the post-application of the vocabulary learning test and classroom engagement scale in favor of the treatment group due to the utilization of the WBT program. Considering the research findings, the study concluded by presenting recommendations and further future research suggestions.

Keywords: Whole Brain Teaching; Vocabulary Learning, Classroom Engagement.

الملخص:

هدفت هذه الدراسة إلي التحقق من فاعلية اثر استخدام طريقة التدريس الدماغي الكلي في تنمية تعلم المفردات، والإندماج الصفي لدي طلاب الصف الثاني في فصول تدريس اللغة الإنجليزية كلغة أجنبية. ولهذا الغرض تم استخدام منهج البحث شبه التجريبي. فأختير ستين تلميذا من مدرسة طه حسين الابتدائية بمحافظة المنيا عشوائيا وقسموا إلى مجموعتين: مجموعة علاجية (ن = ٣٠) التي تم تدريسها باستخدام برنامج التدريس الدماغي الكلي ومجموعة غير علاجية (ن = ٣٠) التي تم تدريسها من خلال طرق التدريس العادية. ولجمع البيانات تم تطبيق اختبار مهارات الاستماع، واختبار تعلم المفردات، ومقياس الإندماج الصفي على عينة الدراسة. وباستخدام الأساليب الإحصائية المناسبة أشارت النتائج إلى فعالية البرنامج المقترح باستخدم طريقة التدريس الدماغي الكلي فوجدت فروق ذات دلالة إحصائية بين متوسطي درجات المجموعتين العلاجية وغير العلاجية في التطبيق البعدي لاختبار تعلم المفردات، ومقياس المشاركة الصفية لصالح المجموعة العلاجية تعزى إلي استخدام طريقة التدريس الدماغي الكلي .وفي ضوء نتائج البحث، اختتمت الدراسة بتقديم التوصيات والمقترحات البحثية المستقبلية.

Introduction

Vocabulary constitutes a fundamental aspect of language acquisition and comprehension, serving as the cornerstone upon which linguistic proficiency is built. Defined as a compilation of words and their meanings, vocabulary encompasses the lexical repertoire that individuals employ in communication and comprehension. Scholars and educators have explored various dimensions of vocabulary, shedding light on its types, significance, challenges, and strategies for effective learning. This introductory chapter endeavors to delve into the intricate facets of vocabulary, drawing insights from scholarly sources and seminal works to elucidate its multifaceted nature.

Vocabulary, as elucidated by sources such as the Oxford Advanced Pupil's Dictionary (2020) and the Cambridge Dictionary Online (2024), encompasses the entirety of words known, learned, or utilized by individuals within a language. It transcends mere rote memorization of word lists, involving the dynamic process of acquiring, comprehending, and employing words across diverse contexts. Jackson (2014) further delineates vocabulary as the aggregate of words within a language, varying in familiarity and usage among individuals and across domains of activity.

The dichotomy between receptive and productive vocabulary, as expounded by Harmer (1991) and Hatch & Brown (1995), underscores the distinction between understanding words passively and actively using them in speech or writing. Receptive vocabulary influences reading comprehension and listening skills, while productive vocabulary facilitates active communication and language proficiency.

In the realm of English as a Foreign Language (EFL) instruction, vocabulary learning objectives aim to cultivate language proficiency and communicative competence among pupils. These goals encompass foundational vocabulary acquisition, expansion of lexical repertoire, retention strategies, active usage promotion, skill development,

autonomy fostering, integration with language skills, and progress monitoring, as delineated by scholars like Aldawsari (2016) and Zhang (2008). Vocabulary mastery holds pivotal significance in language education, serving as the linchpin for effective communication and comprehension. Bintz (2011) underscores vocabulary expansion as a continual pursuit within educational frameworks, emphasizing its integrative role in language skills development and literacy acquisition.

The intricacies of vocabulary learning pose challenges for both teachers and pupils, necessitating comprehensive instructional approaches. Strategies encompass explicit instruction, contextual learning, active engagement, mnemonic devices, differentiated instruction, systematic repetition, constructive feedback, and supportive environments, as advocated by scholars like Nation (2001) and Tomlinson (1999). The symbiotic relationship between vocabulary learning and listening skills underscores the significance of exposure to spoken language in language acquisition. Engaging with diverse forms of communication enhances vocabulary acquisition and strengthens listening comprehension, as evidenced by research highlighting the interdependence of these linguistic domains (Feng & Webb, 2022; Nation & Hunston, 2013).

In addressing the challenges of language learning, innovative approaches like Whole Brain Teaching offer promising avenues for vocabulary acquisition. This dynamic pedagogical method emphasizes interactive engagement, contextual learning, and multisensory experiences, fostering effective vocabulary acquisition and language proficiency among learners, as supported by empirical research (Cahya, 2013; Vidal Castillo, 2015; Kane, 2021).

In summary, the exploration of vocabulary encompasses a rich tapestry of theoretical frameworks, pedagogical strategies, and empirical insights, underscoring its pivotal role in language acquisition

and communication. As this introductory chapter elucidates the multifaceted dimensions of vocabulary, subsequent chapters will delve deeper into specific aspects, elucidating effective instructional methodologies, innovative approaches, and empirical findings shaping contemporary practices in vocabulary learning and teaching.

Engaging young learners in an English as a Foreign Language (EFL) classroom involves creativity, patience, and effective teaching strategies to capture and maintain their attention. Engagement in the classroom is a multidimensional concept involving interest, attention, enthusiasm, and commitment toward tasks and activities (Dennis, 2021; Lane, 2022). This includes pupils' attitudes, emotions, and behaviors during participation, influencing their learning outcomes and experiences (Alhassan et al., 2024; Andujar & Rodriguez, 2020).

Classroom engagement comprises several dimensions: behavioral, cognitive, emotional, and social engagement. Behavioral engagement involves pupils' active involvement in academic pursuits, which correlates with academic success (Siddiq, 2020). Cognitive engagement refers to the level of effort and involvement in learning tasks, including problem-solving and self-regulated learning (Chapman, 2003; Sharan & Than, 2008). Emotional engagement encompasses positive reactions towards learning experiences and fosters a sense of belonging (Hipkins, 2012). Social engagement involves forming bonds with peers and academic staff, promoting inclusivity and cooperation (Pekrun & Linnenbrink-Garcia, 2012; Wentzel, 2012).

In EFL instruction for young learners, classroom engagement is crucial for effective language acquisition and cognitive development (Nakamura et al., 2021). It fosters holistic development by enhancing cognitive skills and socio-emotional competencies, leading to language retention and confidence (Mystkowska-Wiertelak, 2020). Numerous studies highlight the significance of engagement in language learning,

intrinsic motivation, and academic achievement (Baralt et al., 2016; Bikowski & Casal, 2018; Doo & Bonk, 2020).

Whole Brain Teaching (WBT) is a teaching method aimed at enhancing engagement through interactive techniques involving different brain areas (Wolken, 2017). Research suggests that WBT increases student engagement, motivation, and academic performance (Palasigue, 2009; Armijo, 2009; Szott & Molitoris, 2010). Positive outcomes, including improved behavior and engagement, have been observed in EFL contexts following WBT implementation (Cardona Peláez, 2012).

Research has extensively investigated the impact of Whole Brain Teaching (WBT) on language acquisition, motivation, and academic performance across various educational contexts. Domeño (2016) and Hafrianti et al. (2020) demonstrated the efficacy of WBT in enhancing language skills and motivation among pupils learning English as a foreign language. Kholifah (2021) and Salem (2017) highlighted the positive outcomes of WBT implementation in specific subject areas, emphasizing improved listening skills, vocabulary retention, and motivation. Addressing the challenges of listening skills in English language learning, Kieu et al. (2023) explored effective engagement techniques, emphasizing active participation during listening lessons. WBT's emphasis on active listening aligns with its instructional approach, aiming to enhance communication and comprehension skills across diverse educational settings.

Originating from observations by Chris Biffle, WBT represents a pedagogical reform movement aimed at enhancing student engagement and classroom management. Grounded in brain research, WBT integrates seven core techniques, emphasizing whole-brain activation and cooperative learning (Battle, 2010). The incorporation of WBT principles into classroom design fosters a dynamic learning environment, engaging students through sensory experiences and

collaborative activities (Boer et al., 2001). Key techniques like Teach-Okay promote memory retention and active participation, contributing to improved academic outcomes (Hosen, 2015).

Studies have reported positive effects of WBT on student engagement, academic self-concept, and overall performance (Clark, 2016; Lindstrom, 2010). Teachers value WBT for its effectiveness in catering to diverse learning styles and fostering positive attitudes toward learning (Hoss, 2013; Ritchie, 2015). Whole-brain teaching offers a structured approach to classroom management and instruction, promoting positive behavior reinforcement and memory retention (Torio & Cabrillas-Torio, 2016). It encourages student-centered learning and application of knowledge beyond traditional methods, enhancing motivation and skill development (INCI & Erte, 2011).

In short, Whole Brain Teaching emerges as a comprehensive and impactful instructional approach, addressing the diverse needs of students while fostering active engagement, collaboration, and meaningful learning experiences across educational settings. According to the above-mentioned the current research aimed to investigate the effect investigate the effect of using the whole-brain teaching method on developing the 2nd-grade primary school pupils' vocabulary learning, and EFL classroom engagement. In line with these objectives, the following hypothesis is developed:

- There is a statistically significant difference (favoring the treatment group) between the means of scores obtained by the participants of the non-treatment and the treatment group in the post-test of vocabulary learning.

- There is a statistically significant difference (favoring the treatment group) between the means of scores obtained by the participants of the non-treatment and the treatment group in the post-application of the EFL classroom engagement scale.

Materials and Methods

Research Design

The current study utilized the quasi-experimental research design of a pre-post control group design to achieve its objectives. A treatment group and a non-treatment group were exposed to pre-post-treatment material and data collection tools (listening skills test). In addition, the treatment group only was instructed and trained through the Whole-Brain Teaching Program, while the non-treatment group received regular teaching. The researcher instructed both groups to ensure that the study was implemented better.

The Participants

The participants of the present study were sixty 2nd-grade pupils attending Taha Hussien Primary School in Minia Governorate during the first semester of the 2022/2023 academic year. The selection was conducted randomly. These pupils were evenly distributed into two groups: a treatment group comprising thirty pupils, and a non-treatment group also consisting of thirty pupils. In the treatment group, instruction was delivered using the Whole-Brain Teaching program, while the non-treatment group received education according to the curriculum outlined by the Egyptian Ministry of Education. The following pupils were excluded from participation as they were grade repeaters or were absent more than twice from the sessions, and those who missed any of the pre-and post-tests.

Research Instrument

vocabulary skills test

The Vocabulary Skills Test was prepared by the researcher (See appendix F) to assess the following sub-skills: Identifying the form of the targeted vocabulary items, Guessing the meaning of vocabulary items, and connecting new words to their personal experience. The test included 30 items: look at pictures and (✓), rearrange letter items, fill

in the missing gaps items, supply the missing letters, circle the correct answer, and describe using suitable words. A point is given for each correct item. The maximum score is 30 marks.

The researcher constructed the test according to the above-mentioned vocabulary learning sub-skills and the content that was presented in the suggested program. It included thirty items covering the most significant objectives of the program. The test was designed according to the table of specifications. In addition, the key answers were attached to the test.

The survey experiment for the vocabulary test was conducted on a group consisting of (30) pupils from the second grade at Taha Hussien Primary School, in the academic year 2022/2023. The time for the vocabulary test for the second grade was calculated by counting the time consumed by each pupil taking the test and calculating the average to be (45) minutes (one session) to read and answer the test. The test's content validity was assessed by a panel of jury members comprising ten TEFL experts. Those experts evaluated the test according to specific criteria, including the linguistic clarity of items, alignment with learning objectives, appropriateness for participants, coverage of skills tested, and adequacy of model answers. Following suggested adjustments by the jury, they confirmed the test's suitability and relevance. The finalized version of the test, incorporating jury suggestions, was then administered to participants.

The validity of the vocabulary test was calculated using SPSS V.26 software by computing the internal consistency. This was done by finding the correlation coefficient between the score of each vocabulary item and the total score of the dimension to which it belongs, using the survey sample scores, as shown in Table (1).

Table (1) The correlation coefficients between the score of each vocabulary item and the total score of the dimension to which the vocabulary test belongs (N=30)

First Dimension		Second Dimension		Third Dimension	
6	0.542**	1	0.44*	11	0.731**
7	0.735**	2	0.616**	12	0.842**
8	0.713**	3	0.685**	13	0.798**
9	0.518**	4	0.624**	14	0.786**
10	0.492**	5	0.429**	15	0.798**
16	0.463**	21	0.669**	26	0.842**
17	0.537**	22	0.669**	27	0.848**
18	0.457**	23	0.793**	28	0.751**
19	0.736**	24	0.784**	29	0.885**
20	0.745**	25	0.333*	30	0.724**

From the previous table, it is evident that all correlation coefficients between the vocabulary items of the vocabulary test and the dimension to which each item belongs are statistically significant at the (0.05) and (0.01) levels.In addition, the researcher calculated the correlation of each dimension from the dimensions of the vocabulary test with the total score of the test, as shown in Table (2).

Table (2) The correlation coefficients of each dimension from the dimensions of the vocabulary test with the total score

Dimension	Correlation Coefficients
Identifying the form of the targeted vocabulary items	0.621**
Guessing the meaning of vocabulary items	0.644**
Connecting new words to their personal experience.	0.742**

It becomes evident from Table (2) that all correlation coefficients of each dimension from the dimensions of the vocabulary test with the total score are statistically significant at the 0.01 level.

Hence, from Table (1) and Table (2), it is evident that there are high internal consistency indicators for the vocabulary test, indicating the validity of the test.

The reliability of the vocabulary test was calculated using Cronbach's Alpha equation, and the reliability coefficients for the dimensions and the total score as illustrated in table (3).

Table (3) Coefficients for Cronbach's Alpha reliability

Dimension	Item N	Cronbach's Alpha reliability coefficient
Identifying the form of the targeted vocabulary items	10	0.795
Guessing the meaning of vocabulary items	10	0.790
Connecting new words to their personal experience.	10	0.938
The vocabulary test as a whole	30	0.863

From the previous table, it is evident that the values of Cronbach's alpha coefficients are high, indicating a high level of reliability for the vocabulary test.

Classroom Engagement Scale: The survey experiment for the classroom engagement scale was conducted on a group consisting of (30) pupils from the second grade at Taha Hussien Primary School, in the academic year 2022/2023 to verify the scale's validity and reliability. The scale in its initial form consisted of 27 items distributed into three dimensions: behavioral engagement, cognitive

engagement, and emotional engagement. The raters are two teachers, they were asked to rate each pupil's engagement according to a 5-point Likert scale ranging from strongly agree to strongly disagree.

The test's content validity was assessed by a panel of jury members comprising ten TEFL experts. These experts evaluated the test based on specific criteria, including the linguistic clarity of items, alignment with learning objectives, appropriateness for participants, coverage of skills tested, and adequacy of model answers. Following suggested adjustments by the jury, they confirmed the test's suitability and relevance. The finalized version of the scale, incorporating jury suggestions, was then administered to participants. They recommended omitting 3 items as they cannot be observed.

The validity of the vocabulary test was calculated using SPSS V.26 software by computing the internal consistency. This was done by finding the correlation coefficient between the score of each classroom engagement scale item and the total score of the dimension to which it belongs, using the survey sample scores, as shown in Table (4).

Table (4) The correlation coefficients between the score of each item of the scale and the total score of the dimension to which the item belongs in the Classroom Engagement Scale

Behavioral Dimension		Cognitive Dimension		Emotional Dimension	
Item	**Coefficient**	**Item**	**Coefficient**	**Item**	**Coefficient**
1	0.521**	**2**	0.641**	**3**	0.656**
5	0.521**	**4**	0.415**	**9**	0.681**
6	0.842**	**8**	0.441*	**10**	0.531**
7	0.737**	**14**	0.711**	**11**	0.378**
12	0.422**	**16**	0.782**	**19**	0.425*
13	0.384**	**18**	0.712**	**20**	0.613**
15	0.732**	**27**	0.767**	**22**	0.711**

17	0.578**		**24**	0.59**
25	0.414**		**23**	0.385*
26	0.825**		**21**	0.444**

From the previous table, it is evident that all correlation coefficients between the items of the Classroom Engagement Scale and the total score of the corresponding dimension are statistically significant at the (0.05) and (0.01) levels.

In addition, the researcher calculated the correlation of each dimension from the dimensions of the Classroom Engagement Scale with the total score of the scale, as shown in Table (5).

Table (5) The correlation coefficients of each dimension from the dimensions of the classroom engagement scale with the total score

Dimension	Correlation Coefficients
Behavioral Dimension	0.705**
Cognitive Dimension	0.739**
Emotional Dimension	0.383**

From Table (5), it is evident that all correlation coefficients between the scores of each dimension of the Classroom Engagement Scale and the total score of the scale are statistically significant at the (0.05) and (0.01) levels. Hence, from Table (4) and Table (5), it is evident that there are high internal consistency indicators for the Classroom Engagement Scale, indicating the scale validity.

Inter-rater reliability is calculated through the Cooper equation, which calculates the agreement ratio between two raters (observers), as follows:

Agreement Ratio=
$$\frac{Number\ of\ Agreements}{Number\ of\ Agreements+\ Number\ of\ Disagreements} x100\%$$

The researcher calculated the agreement ratio and found it to be approximately (81.48), indicating a high level of reliability for the Classroom Engagement Scale.

The reliability of the Classroom Engagement Scale was calculated using Cronbach's Alpha equation, and the reliability coefficients for the dimensions and the total score as illustrated in table (6).

Table (6) Coefficients for Cronbach's Alpha reliability

Dimension	Item N	Cronbach's Alpha reliability coefficient
Behavioral Dimension	10	0.794
Cognitive Dimension	7	0.61
Emotional Dimension	10	0.703
Classroom Engagement Scale as a whole	27	0.705

From the previous table, it is evident that the values of Cronbach's alpha coefficients are high, indicating a high level of reliability for the Classroom Engagement Scale.

Table (7) of Specifications for Pre-post Classroom Engagement Scale

Dimensions	Items
Behavioral	1-5-6-7-12-13-15-17-25-26
Cognitive	2-4-8-14-16-18-27
Emotional	3-9-10-11-19-20-22-24-23-21

In light of the calculation of validity, and reliability the final form of the test consists of (27) items and a table (7) that illustrates the test items distributed across dimensions.

The Whole Brain Teaching Program: The program comprises four main components: a content analysis section to inform the selection of appropriate teaching methods and activities, a framework delineating the structure of the program, a comprehensive teacher's guide, and a

corresponding pupil book. Each unit within the program consists of five lessons, beginning with overarching objectives for the unit and specific behavioral objectives for each lesson. Additionally, a model of strategies employed by pupils is provided, with each lesson featuring activities designed to enhance listening skills, vocabulary learning, and classroom engagement. The conclusion of each lesson includes an evaluation segment featuring various questions aimed at assessing pupil progress. The Whole-Brain teaching program will introduce theme 2, units (four, five, and six) of Connect for the second-grade primary schools. Throughout the program, a focus is placed on implementing the Whole brain teaching method strategies and activities aimed at developing the independent variables.

Training through the presented program is based on the whole brain teaching strategies and techniques in which pupils learn words individually and by peer tutoring and switching roles under the teacher's supervision and guidance. The researcher utilized these techniques in each session:

1. Class- Yes (Attention Getter).
2. Class Rules (The Organizer).
3. Teach-Okay (Whole Brain Activator).
4. Scoreboard (The Motivator).
5. Mirror (The Class Unifier).
6. Hand & Eyes (The Focuser).
7. Switch (The Involver).

Results

To verify the validity of the first hypothesis, an Independent Samples t-test was conducted using SPSS V.26 software to calculate the significance of the difference between the mean scores of the treatment and non-treatment groups in the post-application of the vocabulary learning test as indicated in Table (7).

Table (7) Mean, Standard Deviation, t-value, and Significance of Differences between Means of Scores Obtained by the Pupils of the Treatment and Non-Treatment groups in the Post-Test of Vocabulary Learning

Group	N	Mean	SD	FD	t-value	Sig.
Non-treatment	30	23.73	3.35	58	20.56	Sig. at 0.01
Treatment	30	6.03	3.31			

From Table (7), it is evident that there is a statistically significant difference at the 0.01 level between the mean scores of pupils in the treatment and non-treatment research groups in the post-application of the vocabulary learning test, favoring the treatment group. Thus, the second hypothesis of the research is confirmed, and therefore,
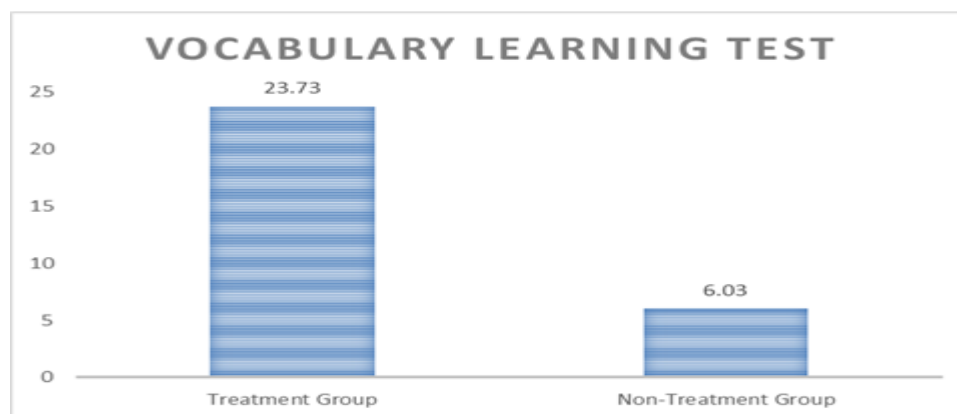
accepted. The following figure illustrates this:

Figure (1): Illustrative Representation of The Mean Scores of Pupils in the Treatment and non-treatment Groups in the Post-Application of Vocabulary Learning Test.

Since the t-test is used to determine the significance of differences, indicating confidence in the existence of differences between the mean scores of the treatment group in the pre-and post-applications of the vocabulary learning test, regardless of the size of the differences, the effect size equation was employed. This involved converting the t-value to η^2 using the effect size equation η^2 to calculate the effect of

using the Whole-Brain Teaching method according to the following equation:

$$\eta2 = \frac{t2}{t2 + df}$$

η2= Eta-squared value, t2= t-value squared, df= degree of freedom

Table (8) The Proposed Reference Table for Determining Effect Size Levels for Each Measure of Effect Size Scales

Tool	Low effect	Medium effect	High effect
η2	0.01	0.06	0.14

(Mansour, 1997, 65)

Table (9) Effect Size Values for The Whole Brain Teaching Program on the Vocabulary Learning Test

Variable	t-value	η2	Effect
Vocabulary test	20.56	0.879	Very high effect

From Table (9), the effect size value (η2) was calculated to be 0.879, which is greater than 0.14. This indicates a very high effect. Therefore, it confirms that the Whole-Brain Teaching program enjoys a high level of impact on vocabulary learning among the treatment group pupils.

The second hypothesis stated that 'There is a statistically significant difference (favoring the treatment group) between the means of scores obtained by the participants of the treatment and the non-treatment group in the post-application of EFL classroom engagement scale'. To verify the validity of the second hypothesis, an Independent Samples t-test was conducted using SPSS V.26 software to calculate the significance of the difference between the mean scores of the treatment and non-treatment groups in the post-application of the EFL Classroom Engagement Scale as indicated in Table (10).

Table (10) Mean, Standard Deviation, t-value, and Significance of Differences between Means of Scores Obtained by the Pupils of the Treatment and Non-Treatment groups in the Post-Application of the EFL Classroom Engagement Scale

Group	N	Mean	SD	FD	t-value	Sig.
Non-treatment	30	119.91	13.11	58	9.44	Sig. at 0.01
Treatment	30	90.85	40.59			

From Table (10), it is evident that there is a statistically significant difference at the 0.01 level between the mean scores of students in the treatment and non-treatment research groups in the post-application of the EFL Classroom Engagement Scale, favoring the treatment group. Thus, the third hypothesis of the research is confirmed, and therefore, accepted. The following figure illustrates this.
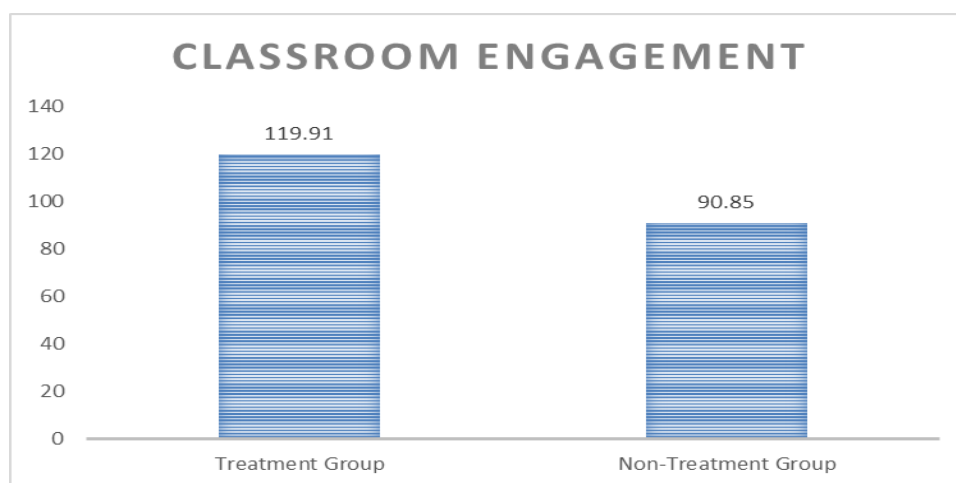
Figure (2): Illustrative Representation of The Mean Scores of Pupils in the Treatment and Non-treatment Groups in the Post-Application of EFL Classroom Engagement Scale

Since the t-test is used to determine the significance of differences, indicating confidence in the presence of differences between the mean scores of the treatment group in the pre-test and post-test applications of the Classroom Engagement Scale, regardless of the size of the

differences, the effect size equation was utilized. This was done by converting 't' into 'η2' using the effect size equation to calculate the effect of implementing the Whole-Brain Teaching program on the development of classroom engagement among second-grade primary school pupils, according to the following equation:

$$\eta2 = \frac{t2}{t2 + df}$$

η2= Eta-squared value, t2= t-value squared, df= degree of freedom

Table (11) The Proposed Reference Table for Determining Effect Size Levels for Each Measure of Effect Size Scales

Tool	Low effect	Medium effect	High effect
η2	0.01	0.06	0.14

(Mansour, 1997, 65)

Table (12) Effect Size Values for The Whole Brain Teaching Program on the Classroom Engagement Scale

Variable	t-value	η2	Effect
Listening Skills	9.44	0.605	Very high effect

From Table (11), the value of the effect size 'η2' is 0.605, which is greater than 0.14. This indicates a very high effect. Hence, it is confirmed that the Whole-Brain Teaching Program enjoys a high degree of impact on the classroom engagement level among the treatment group pupils.

Discussion

With a focus on encouraging active involvement, engaging multiple senses, and providing quick feedback, Whole Brain Teaching (WBT) presents a hopeful approach to enhancing language skills and

promoting cognitive, social, and emotional growth in young children. By utilizing interactive methods that activate both sides of the brain, WBT establishes an immersive and dynamic setting where children can excel in language development and overall development.

The current study aimed to investigate the effect of using a Whole-Brain Teaching Program on developing 2nd-grade primary school pupils' EFL listening skills, vocabulary learning, and EFL classroom management. Findings supported the study hypotheses. Pupils of the treatment group (who were taught using the WBT Program) outperformed the pupils of the non-treatment group (who were taught using conventional teaching methods) in the post-application of the listening skills test, vocabulary learning test, and classroom engagement scale. The introduction of the WBT program impacted students' abilities regarding the study variables.

Following the implementation of the WBT program in the study, both groups underwent the same assessment procedures. Upon analyzing the results obtained through t-tests, it was confirmed that participants in the treatment group significantly outperformed those in the non-treatment group. These findings supported all three hypotheses of the study.

Creating a non-threatening environment for language learning, especially for young learners like second-grade primary school pupils, is essential for their success and enjoyment in acquiring new language skills. One effective method for achieving this goal is by implementing the Whole-Brain Teaching approach. This method emphasizes engagement, participation, and making learning enjoyable for students. By utilizing strategies that stimulate various parts of the brain, teachers can create an environment where students feel supported and motivated to learn.

Positive reinforcement plays a crucial role in building confidence among the pupils of the present study. Teachers should use praise,

encouragement, and rewards to celebrate students' successes, regardless of their magnitude. This approach fosters a supportive atmosphere in which students feel motivated to continue learning and exploring the language. Interactive activities are integral to language learning in a non-threatening environment. Teachers can incorporate activities such as role-plays, group discussions, language games, and storytelling to engage students actively. These activities not only make learning fun but also provide opportunities for students to practice speaking, listening, reading, and writing in a low-pressure setting.

Visual aids are powerful tools for reinforcing language learning. Teachers can use pictures, flashcards, videos, and other visual materials to support vocabulary acquisition and comprehension. Visuals help pupils grasp new words and concepts more easily, enhancing their overall learning experience. Movement and gestures are effective in stimulating different parts of the brain and reinforcing language learning. Teachers can encourage pupils to use physical movements and gestures during language activities, such as acting out words or using hand motions to accompany language patterns. These kinesthetic activities make learning more interactive and memorable for students.

Peer collaboration promotes a supportive learning environment where pupils can work together and learn from each other. Pair or group activities allow students to practice speaking and listening in a low-pressure setting, enabling them to learn from their peers' strengths and support each other through challenges. Differentiated instruction acknowledges that students have different learning styles and abilities. Teachers should provide a variety of learning activities and allow students to choose tasks that align with their interests and strengths. This approach ensures that all students can engage meaningfully in the language learning process.

Low-stakes assessment minimizes the emphasis on formal evaluation and focuses on informal activities that allow students to demonstrate their understanding without fear of failure. Games, quizzes, and short tasks can be used to assess language proficiency in a relaxed and non-threatening manner. Creating a safe and supportive environment is paramount in language learning. Teachers should cultivate a classroom culture where mistakes are viewed as valuable learning opportunities rather than failures. Encouraging students to take risks and try out new language skills without fear of embarrassment or judgment fosters a positive learning atmosphere.

Incorporating these strategies into language learning activities based on the Whole-Brain Teaching method can create a non-threatening environment where second-grade primary school pupils feel confident, motivated, and eager to develop their language skills.

The results of the second hypothesis illustrated that there was a statistically significant difference at the 0.01 level between the mean scores of pupils in the treatment and non-treatment research groups in the post-application of the vocabulary learning test, favoring the treatment group. In addition, the program achieved a high effect size on developing pupils' vocabulary learning.

Utilizing the Whole Brain Teaching (WBT) approach in learning English as a Foreign Language (EFL) vocabulary can yield various benefits. By incorporating gestures, movement, and vocalization, WBT enhances student engagement and caters to different learning styles through its multi-sensory methodology. The interactive nature of WBT encourages active participation and fosters a supportive learning environment where students feel comfortable practicing new vocabulary. Moreover, the repetition and reinforcement inherent in WBT techniques aid in vocabulary retention, while collaborative activities promote social learning and facilitate contextual usage of words. This result agrees with various previous study results indicating

the positive effect of using WBT in developing vocabulary learning, acquisition, and retention (Cahya, 2013; Emyus et al., 2020; Kusumayati, 2015; Kane, 2021; Mohamed, 2017)

The third hypothesis results revealed that there was a statistically significant difference at the 0.01 level between the mean scores of pupils in the treatment and non-treatment research groups in the post-application of the EFL Classroom Engagement Scale, favoring the treatment group. In addition, the program achieved a high effect size on developing pupils' classroom engagement.

Integrating the Whole Brain Teaching (WBT) approach can significantly influence pupils' behavioral, cognitive, and emotional engagement within the classroom. Regarding behavioral engagement, WBT emphasizes dynamic participation through interactive techniques like gestures and call-and-response methods. This active involvement serves to capture students' attention and minimize disruptive behaviors, fostering a more conducive learning environment. Additionally, the structured and engaging nature of WBT lessons cultivates a positive atmosphere, encouraging students to actively participate and collaborate with their peers.

In terms of cognitive engagement, WBT employs strategies such as frequent comprehension checks and breaking down information into manageable segments. By utilizing these techniques, WBT facilitates deeper understanding and reinforces learning, thereby enhancing students' cognitive engagement. Furthermore, the incorporation of movement and gestures in WBT activities stimulates various areas of the brain simultaneously, promoting better memory retention and cognitive processing among students.

Emotionally, WBT contributes to students' engagement by fostering a sense of community and support within the classroom. The interactive and collaborative nature of WBT activities encourages students to connect with their peers, creating a positive and inclusive

learning environment. Additionally, WBT often incorporates elements of humor and positive reinforcement, which helps to build students' confidence and self-esteem. Through active participation and opportunities for recognition, WBT nurtures students' emotional engagement, leading to increased motivation and enjoyment in the learning process. This result is also supported by previous studies illustrating that using WBT enhances the pupils' level of engagement (Armijo, 2009; Szott& Molitoris, 2019; Cardona Pelaez et al, 2012; Fall, 2016; Knox, 2016)

Overall, integrating the Whole Brain Teaching method has a multifaceted impact on students' engagement, addressing behavioral, cognitive, and emotional dimensions of learning. By promoting active participation, deepening understanding, and fostering a supportive classroom environment, WBT contributes to creating a dynamic and effective learning environment for students.

Recommendations

1. *Ongoing Professional Development:* Provide ongoing professional development opportunities for teachers to familiarize themselves with Whole-Brain Teaching principles and strategies. Workshops, seminars, and online resources can support educators in effectively implementing the program's techniques and adapting them to the specific needs of their EFL classrooms.

2. *Assessment and Monitoring:* Regularly assess and monitor students' progress in EFL listening skills and vocabulary learning to gauge the effectiveness of Whole-Brain Teaching interventions. Use a variety of assessment methods, including informal observation, quizzes, and performance tasks, to capture different aspects of language proficiency and growth over time.

3. *Collaborative Learning Communities:* Foster collaborative learning communities among teachers, where they can share

best practices, exchange ideas, and collaborate on implementing Whole-Brain Teaching strategies in EFL instruction. Peer support and collaboration can enhance implementation fidelity and innovation in teaching practices.

Suggestions for Further Research

In light of the study findings, the following topics are proposed:

1. Explore the adaptability and effectiveness of the Whole-Brain Teaching Program in diverse cultural and linguistic contexts. Investigate whether modifications or additional support are needed to ensure its efficacy for students from different backgrounds.

2. Investigate the role of teacher training and implementation fidelity in maximizing the benefits of the Whole-Brain Teaching Program. This could involve assessing how variations in teacher proficiency and adherence to program guidelines impact student outcomes.

3. Compare the effectiveness of the Whole-Brain Teaching Program with other teaching methodologies or programs in terms of enhancing EFL listening skills, vocabulary learning, and classroom management. This could involve implementing different teaching approaches in different classrooms and analyzing their outcomes.

4. Conduct a longitudinal study to track the progress of students over an extended period, such as a school year or multiple school years, to observe the sustained impact of the Whole-Brain Teaching Program on their EFL skills and classroom behavior.

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