

The Effectiveness of Whole-Brain-Learning in Teaching Oral Communication to Senior High School Students

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Abstract The purpose of this study was to investigate the effectiveness of Whole Brain Teaching (WBT) compared to Conventional Teaching (CT) in enhancing the understanding of Principles of Speech Delivery among Senior High School students. Participants, consisting of a Controlled Group of 42 and an Experimental Group of 43, were randomly assigned to both teaching methods, with the Whole Brain Teaching Method having 43 participants, while the Conventional Teaching Method had 42. The study used Pre-Test and Post-Test objective tests to measure the students' understanding of the topic, and self-administered questionnaires to collect feedback from the students. The results indicated that the students in the experimental group using WBT had significantly better performance compared to the control group using CT. The study's findings revealed that the use of WBT in the Oral Communication subject was more effective than CT, highlighting the potential of WBT as an effective teaching strategy for educators to consider. Moreover, the study recommends developing modules and instructional materials using WBT in English subjects to enhance Senior High School students' English language skills. This recommendation is particularly important in a globalized world where English proficiency is increasingly valued. Additionally, the study highlights the potential of WBT to improve language learning outcomes, further emphasizing the benefits of incorporating WBT as a teaching strategy. Overall, this study contributes to the ongoing discussion about effective teaching strategies and provides practical recommendations for educators to enhance their teaching practices and improve their students' learning outcomes.

Keywords Whole Brain Teaching (WBT), Conventional Teaching, and Senior High School

1. Introduction

Existing studies, such as Limniou [1] and Kennedy et al. [2], have consistently reported that millennial students heavily rely on their electronic gadgets while in the classroom. Consequently, 21st-century teachers face the challenge of exploring various teaching strategies that can capture and maintain their students' attention, as well as increase engagement in class. One approach that has shown promise in increasing student engagement and achievement in science education is Whole Brain Teaching (WBT). Several studies have investigated the effectiveness of WBT in science education, including studies by Bilican and Korkmaz [3], Mak and Leung [4], and Pedretti and Nazir [5]. Their findings suggest that WBT can improve student motivation, achievement, and knowledge acquisition in science. Additionally, Haak et al. [6] found that using a whole-brain teaching approach in a college-level anatomy and physiology course improved student learning outcomes compared to traditional lecture-based instruction. These studies highlight the potential benefits of using WBT in science education. However, there is currently no research on whether WBT is equally effective in English Language Teaching (ELT). Additionally, WBT has traditionally been used in preschool, elementary, and junior high school

education. This study aims to bridge these gaps by investigating the effectiveness of WBT strategies in senior high school ELT classrooms.

In 1999, Chris Biffle advocated for the development of strategies by teachers to boost student achievement and engagement in the classroom. Following his 25 years of experience in a mainstream classroom, he introduced Whole Brain Teaching (WBT), which comprises seven teaching strategies. Various studies have suggested that the implementation of WBT strategies in the classroom can enhance both academic achievement and self-efficacy among students [7,8].

Several studies have demonstrated that involving multiple senses in the learning process can increase retention. For instance, Rizzo et al. [9] found that elementary school students who received multisensory instruction involving visual, auditory, and kinesthetic learning techniques had improved reading comprehension and word recognition skills. Additionally, John Dewey's theory of learning by doing, emphasizes the importance of practical and relevant learning over passive and theoretical learning. Schank [10] supported this theory and noted that implicit learning through practical experiences is more effective than explicit learning.

There was a Chinese saying that goes, "Tell me and I'll forget, show me, and I may remember; involve me, and I'll understand." This line connects correspondingly to John Dewey's Learning by doing and Edgar Dale's cone of Experience because both theories advocate the use of experiential learning in education.

According to Anderson [11], Dale's Cone of Experience is a model that incorporates several theories related to instructional design and learning processes. She explains that during the 1960s, Edgar Dale theorized that learners retain more information by what they "do" as opposed to what is "heard", "read," or "observed". His research led to the development of the Cone of Experience. Today, this "learning by doing" has become known as "experiential learning" or "action learning". Generally speaking, the more senses are involved in the learning process of a student, the higher retention will be achieved.

In the Philippines in 2013, the Department of Social Welfare and Development (DSWD) and the Department of Education (DepEd) launched Kariton Klasrum with the theme "Katropa, Edukasyon at Kalusugan Mo'y Sagot ko! Sakay na sa Kariton ng Pagbabago!" in Ultra Sports Complex, Pasig City. This event aims to promote "No child will be left behind" because of this project, teachers are challenged to explore strategies that would fit the learning styles of each Filipino student. Positively, according to Wong [12], one known factor of student achievement is student engagement, and one set of strategies that claims to increase student engagement is called Whole Brain Teaching.

In the research conducted by Wong [12], he explained that WBT is a collaborative learning technique in which the teacher uses different strategies to keep students interested

and create positive classroom management. WBT is based on Herrmann's four-quadrant whole brain model that combines auditory, verbal, and visual elements of teaching instruction.

Another evident case study was presented by Armijo [13]; he examined the impact of WBT on student achievement at San Jacinto. As a result of this observation, he developed strategies to improve learning in the classroom; WBT emerged as a grassroots educational reform movement in Elementary School. Both quantitative and qualitative research methodologies were utilized for this study through the analysis of assessments and surveys. This case study found that Whole Brain Teaching has had a positive effect on student achievement when used.

Furthermore, Fishel [14] studied the WBT method for seven months with a small class of private preschool kindergarteners; in her paper entitled "Total Participation Teaching Methods in the Elementary classroom reading and math.", she proved that the WBT method promotes students to learn the material through visual, auditory, kinesthetic, and cooperative learning techniques. She emphasized that the newly found teaching method is promising and highly effective, and fun for learning both content and behavior management skills in the early years of education.

Wong [12] confirmed that WBT is also applicable to the Tertiary level regardless if it originated from the primary and secondary school levels. He provided strong evidence that WBT is effective in teaching top-up degree students. During his implementation, he reported that most of the students did participate when the WBT strategies were used. Many students actually tried to teach each other in English, which is their first language. However, there were also a few students who did not participate at all, but they all agreed that they were able to learn more about the subject. They also agreed that the Attention-Getter strategy helped them to get their attention back on the teacher.

From the overall shreds of evidence collected, this mixed-method study examined the effects of WBT on student engagement and academic achievement of senior high school students with exposure to Whole Brain Teaching techniques as measured through a Survey, Pre-test, and Post-test in a duration of one-week discussion. This study contributes to the educational field of teaching English to senior high school students.

2. Statement of the Problem

The purpose of this study was to increase student engagement and academic achievement of senior high school students by applying Whole Brain Learning strategies in the field of English Language Teaching. The study sought to answer the following specific questions:

- How did the students in the control and experimental groups perform in the pre-test?
- How did the performance of the control and

- experimental group perform in the post-test?
- Was there a significant difference between the scores in the pretest and posttest results of the control and experimental groups?
- What were the perceptions of the students toward WBT?

3. Methodology

3.1. Research Design

The researcher has utilized a true experimental research design, specifically, one group pre-test-post-test design, in order to determine the effects of whole brain learning in teaching oral communication to ABM students.

This study follows four phases done by the researcher. In phase 1, the researcher developed a test and lesson plan, which was validated by the experts; in phase 2, the researcher implemented the Pre-test, Lesson Plans, Post-Test, and Survey. In phase 3, the researcher started to evaluate the results of the test. And lastly, in phase 4. The researcher analyses the results of the data.

3.2. Participants of the Study

The participants of this study were 2 sections of Grade 11 students from Accountancy and Business Management (ABM) students enrolled in a private university in Manila, Philippines (ABM); the ABM strand focuses on the basic concepts of financial management, business management, corporate operations, human resources, and marketing. The students in this strand range from 16-18 years old.

Table 1. Number of Participants

Section	Total Number Of Students
ABM 2	42
ABM 6	43
Total	85

3.3. Sampling Technique

The researcher used Non-Probability Purposive Sampling Technique in this study since only two sections were picked out of 6 sections of ABM. The two sections picked have comparable scores in the pre-test. One class was taught in a conventional way, and the other one was taught by applying selected WBT strategies.

3.4. Research Instruments

3.4.1. Lesson Plan

The researcher constructed two sets of semi-detailed specialized lesson plans for oral communication, injecting the whole-brain and conventional teaching approaches, respectively. The specific instrument focused on the

Principles of Delivering a Speech. The English Teachers' experts were asked to validate the lesson plans in Oral Communication. The validators have been teaching English subjects for 5 years. The recommendations and suggestions served as the bases for the revision of the Lesson Plan.

Questionnaires were provided to the experts to validate the lesson plans. A five-point rating scale ranging from (5) - Outstanding, (4) – Very Good, (3) – Good, (2) – Fair, (1) – Needs Improvement was the basis for the assessment of lesson plans.

Based on the expert’s evaluation of the objectives of the lesson plans, the average weighted mean was 4.4. The English experts agree that the objectives follow the SMART principle in making a lesson plan which is simple and specific, measurable, attainable, result oriented and realistic, and time-bounded.

The manner of presentation of the lesson plans has an average weighted mean of 4.4. It shows that the experts agree with the appropriateness of the lesson plans presentation. They find the lesson comprehensive, easy to use, suitable for the student’s ability, and provides greater opportunity for learning.

The activities of the lesson plans were found to be student-oriented. The average weighted mean was 4.8. It shows that these activities can enhance the learner’s understanding of English. The experts agree that the activities provided were appropriate to the ability of Grade 11 senior high school students.

The experts' evaluation results show that the developed lesson plans were useful. The average weighted mean of 4.43 shows that experts agree that both lesson plans can be used in teaching English.

3.4.2. Pre-Test and Post Test

As part of gathering information and data in the study, the researcher utilized and constructed pre-test and post-test to determine the effects of whole-brain teaching before and after the implementation. The test questionnaire was validated by experts in the field of English, and it consists of 25 objective-type questions.

3.4.3. Student’s Perception of a New Teaching Strategy

The survey was adapted from published action research by Adam Wong entitled Applying whole-brain-teaching in self-financed top-up degrees, Working Paper Series No. 2, Issue 6, 2015. It was a paper-based self-administered questionnaire. No personal identity information was collected so that the students would not have to worry that their answers would affect their results in the subject. The Researcher modified the survey. The questions Q3 to Q15 were about Teach–Okay. The questions Q16 to Q25 were about the Class- Yes. Instead of the 5- Point Likert Scale, the Researcher removed the Neutral from the survey to avoid safe answers from the students. The answers to these questions are rated on a Likert 4-point scale, in which “4” means “Strongly Agree”, “3” means “Agree”, “2” means

“Disagree”, and “1” means “Strongly Disagree”. The questions Q1, Q2, Q16, and Q26 were open-ended questions.

3.5. Statistical Treatment

T-Test was used to compare the pre-test and post-test scores of the controlled and experimental groups, and the Likert scale was used to measure the experimental group’s perception of WBT strategies.

4. Results and Discussion

4.1. Mean of the Pre-Test

The table below shows the average results of the pretest scores of both the control and experimental group.

Table 2. Performance in Pre-test

Group	N	Mean	Standard Deviation	Verbal Description
Controlled Group	42	16.5714	2.98077	Fair
Experimental Group	43	16.7907	3.21868	Fair

Legend: 0-10= Poor, 10-17=Fair, 17-21= Good, 21-25 = Very Good, 22-25=Excellent

The average score results of the pre-test were 16.5714 for the Control Group and 16.7907 for the Experimental Group. Both groups had comparable average scores during the pre-test and got fair remarks.

4.2. Mean of the Post Test

The following table shows the average results of the post-test of both the control and experimental group. Groups have different average scores during the post-test.

The average score results of the post-test were 19.3571 for section 2 (Controlled Group) and 22.3023 for section 6. Controlled Good got a good remark, while Experimental Group got a Very Good remark.

Table 3. Performance in Post-test

Group	N	Mean	Standard Deviation	Verbal Description
Controlled Group (ABM 2)	42	19.3571	3.15317	GOOD
Experimental Group (ABM 6)	43	22.3023	2.35569	VERY GOOD

Legend: 0-10= Poor, 10-17=Fair, 17-21= Good, 21-25 = Very Good, 22-25=Excellent

4.3. Comparison of both Controlled and Experimental Group in Post Test

The Experimental Group (ABM 6) gained 5.51% compared to the Controlled Group (ABM 2), which gained 2.78% in the post-test. The data show differences in their final scores. This implies that the two techniques in teaching produce different products, which are significantly different.

Table 4. Comparison of Pre-test and Post Test in both Group

Group	N	Post Test	Increase	Significance Difference
Controlled Group (ABM 2)	42	19.3571	2.78	.745
Experimental Group (ABM 6)	43	22.3023	5.51	.000

4.4. Students' Perception of the WBT Technique

Thirty-two (32) out of Forty-three (43), or 74.42% of the total respondent from the experimental group, answered the questionnaire. The answers to the open-ended questions Q26 and Q27 are listed below. The responses to Q4 to Q16 and Q18 to Q25 are summarised in Table 5.

4.4.1. About "Teach-Okay"

- Everyone should participate
- It should be used by the other lecturer so students will understand the lesson more
- To help the students understand the lesson
- To improve students' communication skills

4.4.2. About "Class-Yes"

- Use it often so the attention of the students will only focus on the teacher
- Use a lively voice and different intonation

Table 5. Responses to the questions on “Teach-Okay” and “Class Yes”

Technique	Question	Average Score	Verbal Indicator
Teach Okay	I know what I should teach another student	3.43	Agree
	I participate actively in “Teach-OK”	3.15	Agree
	I try to teach another student in “Teach-OK”	3.31	Agree
	Teaching others makes the lesson more Interesting.	3.62	Strongly Agree
	Teaching others is fun.	3.59	Strongly Agree
	Teaching others helps me understand the contents	3.6	Strongly Agree
	I actually learn more when I teach others	3.46	Agree
	Teaching others helps me prepare for the project presentation	3.59	Strongly Agree
	Teaching others helps me express myself better at work	3.62	Strongly Agree
	I have no trouble in finding someone to teach	3.25	Agree
	There is always someone willing to teach me	3.25	Agree
	I want the lecturer to use “Teach-OK” more Frequently	3.43	Agree
	I suggest “Teach-OK” be used next year	3.43	Agree
	Class-Yes	When the teacher says “Class”, I say “Yes” in reply	3.87
I say “Yes” in the same way the teacher says “Class Yes”		3.90	Strongly Agree
I like the lecturer to use different voices to say “Class Yes”		3.71	Strongly Agree
"Class-Yes" makes the lesson more interesting.		3.81	Strongly Agree
"Class-Yes" helps me to put my attention back to the lesson.		3.84	Strongly Agree
"Class-Yes" helps me to put my attention back to the lesson.		3.84	Strongly Agree
"Class-Yes" makes everyone to focus on the teaching		3.84	Strongly Agree
The lecturer should use "Class-Yes" more frequently		3.68	Strongly Agree
I suggest "Class-Yes" be used next year		3.71	Strongly Agree
Overall : Strongly Agree			

Strongly Disagree (SD) = 1pt, Disagree (D) = 2pts, Agree (A) = 3pts and Strongly Agree (SA) =4pts

The above results show that most students had generally positive attitudes about the WBT technique. Out of the 22 questions, 14 questions receive an average score of 3.5 or higher.

For Teach okay, the highest combined average score is 3.625. Teaching others makes the lesson more interesting; teaching others helps me understand the content, and teaching others helps me express myself better at work. These are important because it helps the students to experience teaching their classmates and it equips the students with the knowledge they need to understand.

For Class-Yes, the highest combined average score is

3.90 “ I say “Yes” in the same way the teacher says “Class”, followed by a combined average score of 3.80. "Class-Yes" helps me to put my attention back to the lesson”, and "Class-Yes" helps me to put my attention back to the lesson. And Class-Yes" makes everyone focus on the teaching. These are important because it makes everyone focused and get the attention of the students.

5. Findings

When the author implemented the Pre-test, both students

from the control and experimental groups got a comparable score during the pre-test exam, and there was no significant difference. After the implementation of the two lesson plans, the researcher observed that the experimental group, which taught using WBT performed and participated more in class than the control group, which taught using Conventional Teaching.

The results of the post-test of both the control and experimental group show a big significant difference. The experimental group, which taught using WBT, got 2.73% higher compared to the control group's scores.

Based on the questionnaires given by the researcher, most students agreed that the Teach-Okay strategy helped the students to understand the lesson, and the Class-Yes strategy helped them to get their attention back on the teacher.

6. Conclusions

Based on the findings, the following conclusions were derived:

1. Despite the fact that WBT originated from primary and secondary levels and it is mostly used in science education, the result of this experimental study indicates that WBT techniques of Teach-Okay and Class-Yes can be effective when teaching English to Senior High School Students.
2. This research supports the claims of Szott and Molitoris [15] and Wolken [16] that Whole Brain Teaching makes lessons more interesting, interactive, and attention-sustaining, which causes our students to behave more appropriately in our classroom setting. The teach/okay method increases the participation of students in the classroom. This strategy allows students to share their knowledge with one person before sharing it with the whole class. Students are then given the opportunity to test out what they know and thus more give them confidence and willingness to participate.
3. This research supports the claim of Davis and Summer [17] that experiential learning activities encouraged these students to reflect critically on ways to apply leadership theory in the workplace; therefore, Non-traditional students, as well as traditional students, support the use of experiential learning in various courses and disciplines.
4. This research provides evidence to support Wong [12] and Torio [18], WBT increases student engagement and, in turn, increases student achievement.

7. Recommendations

This research has achieved a significant milestone in creating lesson plans that were validated by experts, who agreed that both sets of lesson plans could be effectively

used in teaching English. These lesson plans can serve as a model and can be further improved and adopted by other education researchers to study the use of WBT techniques in different contexts. It should be noted that the results of this experimental study cannot be generalized to all senior high schools studying English, as the participants were limited to a private university in Manila, Philippines.

To address this limitation and to further improve the study, the author plans to make several improvements in the future. First, the author aims to increase the number of participants by including students from different academic strands such as STEM, HUMSS, GAS, and ADT. Second, the author plans to explore other WBT strategies that can be applied in teaching English, in addition to those used in this study. Finally, the author intends to increase the duration of the study from weeks to a semester to provide more in-depth insights into the effectiveness of WBT in teaching English. By making these improvements, the study can provide a more comprehensive and nuanced understanding of the potential benefits of WBT in language learning.

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