

**EFFECTIVENESS OF IMPLEMENTING REVERSE WHOLE BRAIN IN LISTENING AND SPEAKING COURSES AT UNIVERSITY X****Yules Orlando Sianipar<sup>1</sup>, Ilza Mayuni<sup>2</sup>, Zainal Rafli<sup>3</sup>**

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Technology has significantly impacted all aspects of life, from voice-controlled cars to easily accessible security systems. Today, advances in technology continue to shape many aspects of human life. Technology, ease of access, and communication are some of the factors that have evolved in line with current global developments. The question is: How is the Reverse Whole Brain Model applied to university students? In this section, the researcher outlines the objectives to be achieved as a reference for answering the research questions and determining how the Reverse Whole Brain Model is applied to university students. Each teaching material has its own objectives, which teachers must facilitate using appropriate teaching methods. The researchers hope the methods offered can meet learners' needs in line with the objectives of each material taught. Sianipar's (2025) article states that the Whole Brain Model is a good method to use, but requires adjustments due to brain damage. Sianipar states that "the whole brain method can teach from various aspects of the brain without having to rely on only one side" (Sianipar, 2025). Sianipar explains that the Reverse Whole Brain Method is a teaching method that starts on the right side of the brain and moves to the left, the opposite of the Whole Brain Method. The design chosen in this study is a one-group pretest-posttest. A one-group pretest-posttest research design is one in which the same group receives a treatment. The difference in pretest and posttest scores will be measured using the Wilcoxon Signed-Rank Test (nonparametric test). This test is particularly useful when comparing two related samples, matched samples, or performing multiple measurements on a single sample to see whether the population mean ranks differ

**Keywords:** *Reverse Whole Brain Method, Listening and Speaking, One-Group Pretest-Posttest***Background**

The world has become increasingly dynamic in times like these. Access to everything has become easier for humans due to technological advancements. Technology has significantly impacted all aspects of life, from voice-controlled cars to easily accessible

security systems. Today, technological advances have affected many aspects of human life. Technology, access, and communication are among the factors that have evolved in line with current global developments. Unfortunately, education has not kept pace.

Several articles used in this study state that a gap in technological development exists in education. "Digital-based learning, required by the government since the COVID-19 pandemic in early 2020 until mid-2022, has not been fully implemented by teachers and students in lagging areas" (Swandi et al., 2024). Swandi et al. found that digital learning is unevenly distributed and that some teachers and students still lack understanding of how to use it. They also highlighted the government's need to improve facilities and increase support for teachers' and students' understanding of digital learning. "Lag in general and academic lag in particular is a relatively common phenomenon that tends to increase due to technological progress, especially in the online learning period due to the COVID-19 pandemic in the years 2020 and 2021" (Alwahaibi et al., 2023). Alwahaibi et al. concluded that the educational gap has persisted since the pandemic and observed that it is especially pronounced among A'Sharqiyah University students. This is attributed to the effects of technological developments on physical and mental health, particularly among higher education students.

"The study entitled "Educational Lag in Higher Secondary Education Institutions in Ixtapaluca, Valle de Chalco, and Chalco" is to analyze the impact of the COVID-19 pandemic on school dropout rates and educational quality in these municipalities" (Aldape-Enriquez et al., 2024). Aldape-Enriquez et al. show that the COVID-19 pandemic has created gaps in education. These problems affect school dropout rates and educational quality disparities in Mexico. Several strategies have been implemented in Ixtapaluca, Chalco, and Valle de Chalco in Mexico. One of them is the implementation of technopedagogical methods. Aldape-Enriquez et al.'s paper states that this method needs to continue to meet students' learning needs and provide new learning methods. "Despite continuous efforts, the educational achievement gap remains, in most societies, a significant obstacle to ensuring greater equity and social justice" (Cabral-Gouveia et al., 2023). Despite numerous efforts, the educational achievement gap remains a significant issue, according to Cabral-Gouveia et al. Cabral-Gouveia et al. state that evaluations of educational strategies, projects, and initiatives are necessary. They suggest that improving

teaching methods is crucial to mitigate negative impacts on graduates and improve their performance.

Previous studies reviewed by the author indicated a need to improve teaching and learning methods to help graduates become better individuals. This is why the author feels it is important to analyze the effectiveness of new teaching methods, the Reverse Whole Brain Model. Many teaching methods have emerged worldwide and are used by teachers. However, the Reverse Whole Brain teaching method differs from existing methods. The Reverse Whole Brain Model is a teaching method that is believed to activate all quadrants of the human brain. The Reverse Whole Brain Model is a modification of the Whole Brain Model that Sianipar (2025) believes can help students with disabilities due to brain damage. "The studies above show that the whole brain method is a plus as a method needed for learners with this aphasia disorder, but there must be adjustments to overcome the disorder" (Sianipar, 2025). Sianipar felt these adjustments were necessary to address the deficiencies of learners with aphasia.

This follow-up research by Sianipar emphasizes the effectiveness of the Reverse Whole Brain Model. The researcher used this model in a Listening & Speaking class at a university. This study aims to prove the model's effectiveness before implementing it with learners with language and speech disorders, including aphasia. Before testing it, the researcher aims to determine its effectiveness for typical students to understand how useful it is for them.

The question is:

- How is the Reverse Whole Brain Model applied to university students?

In this section, the researcher outlines the objectives to be achieved as a reference in answering the research questions.

- To determine how the Reverse Whole Brain Model is applied to university students.

Learning Method

"The existing ones are generally private and, therefore, charge a fee. This condition signifies the need for an open-access educational platform that simultaneously facilitates students with language and digital literacy and optimizes their potential to learn English in different learning environments (online/onsite) or blended/hybrid learning" (Mayuni

et al., 2024). Mayuni et al.'s research states that digital platforms are needed to optimize hybrid learning. This demonstrates the potential for online media as a new teaching method; however, the availability of free online media remains limited. Teaching methods today are limited; many teachers are still unwilling to adapt them to achieve learning objectives. The key to improving the learning process lies within the teacher. Teachers must understand which methods align with the learning objectives and material. This aligns with research by HK et al., which states that teachers are expected to determine appropriate teaching methods that align with the objectives and material being taught (HK et al., 2024). Another study by Simanjuntak et al. stated that current teaching methods are inadequate in preparing students for the workforce. This study introduces and evaluates a learning framework designed to address gaps in traditional teaching methods, which often fall short in preparing students for real-world challenges and incorporating digital tools into the learning process (Simanjuntak et al., 2025). This study shows that teaching methods in maritime high schools and colleges lack the skills needed to meet the needs of the global workforce. Curriculum improvements and enhanced teaching strategies are still needed to enhance the professionalism of future graduates. These two studies indicate that the current state of English language learning is poorly supported because it lacks teaching methods appropriate to the conditions and desired objectives. Each teaching material has its own objectives, which teachers must facilitate using appropriate teaching methods. The researchers hope the methods offered can meet learners' needs in line with the objectives of each material taught.

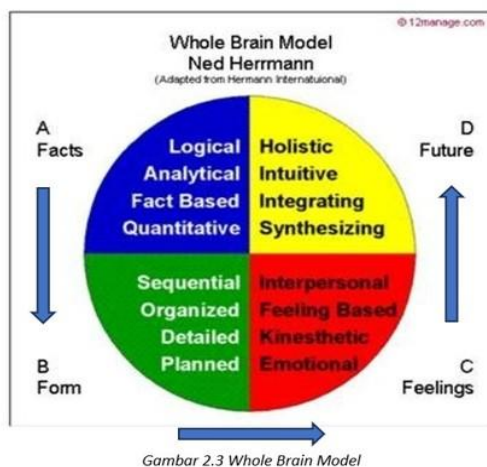
#### Reverse Whole Brain Model

Upon further examination, Sianipar (2025) is the only source that references the Reverse Whole Brain Model. "The studies above show that the whole brain method is a plus as a method needed for learners with this aphasia disorder, but there must be adjustments to overcome the disorder" (Sianipar, 2025). Sianipar's research states that modifications to the Whole Brain Model are necessary to address the deficiencies of learners with aphasia. Understanding the Whole Brain Model is helpful. The Whole Brain Model describes how the brain works. Ned Herrmann first proposed it (Boer et al., 2011). Herrmann's model shows the left and right sides of reason (cerebral system), and the left and right sides of emotion (limbic system). These four quadrants are the brain's thinking areas because they have neural cortices (areas shown to be involved in thinking). Each quadrant has very

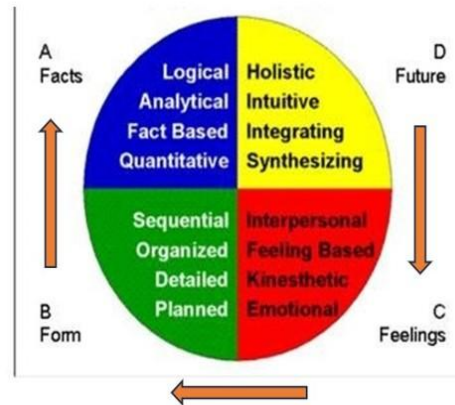
distinct clusters of cognitive functions" (Boer et al., 2011). The Herrmann Model is used as a brain measurement tool to determine how a person thinks and which quadrant they are more inclined to.

Boer et al. further developed this model as a teaching and learning model. "Ultimately, we claim that activating whole brain® innovation to nurture multiple intelligences is only a particle of the higher education cosmos" (Boer et al., 2015). Boer et al. believe that the Whole Brain Model teaching and learning method, adapted from the Herrmann model, can activate intelligence across multiple quadrants simultaneously.

Sianipar's (2025) article states that the Whole Brain Model is a good method to use, but requires adjustments due to brain damage. Sianipar states that "the whole brain method can teach from various aspects of the brain without having to rely on only one side" (Sianipar, 2025). Sianipar concludes that the Reverse Whole Brain Method is a teaching method that starts on the right side of the brain and moves to the left, the opposite of the Whole Brain Method.



Gambar 2.3 Whole Brain Model



Gambar 2.4 Reverse Whole Brain Model

Figure 1 Whole Brain Model VS Reverse Whole Brain Model

When using it, it begins with the upper right hemisphere of the brain, which relates to a person's holistic abilities and how things occur in a person's daily life. The material is presented using images that relate to the students' daily experiences. From the upper right hemisphere, the teaching continues to the lower hemisphere, but remains focused on the right hemisphere. The material taught connects to what students feel is relevant. Next, the teaching moves to the lower left hemisphere. In the lower left hemisphere, it is linked to

instructional methods, teaching students the proper sequence of the material. Finally, the teaching continues to the upper left hemisphere. In this section, teaching focuses on how students reason about the material. Students are taught how to analyze the material.

#### Listening and Speaking Class

The researchers chose the Listening and Speaking class because it gives teachers maximum interaction with students. "Of the two courses, the one that requires direct interaction in its teaching is Listening and Speaking" (Sianipar, 2026b). The researcher considers it essential to teach these skills to students. Numerous research articles have shown that speaking and listening skills are highly needed in today's world. One such article is "In the current conditions of rapid development of science and technology, the development of communicative skills in a foreign language at a high level is relevant, which indicates the need to improve them through listening and speaking activities" (Pavlovskaya et al., 2022). Pavlovskaya et al. state that in a rapidly developing world, the ability to communicate in a foreign language is highly needed. This is why Pavlovskaya believes it is crucial to improve listening and speaking skills. "This signifies that when students converse with their peers, they are not merely practicing the language; they are also learning how to apply it in real-life contexts" (Saeid, 2024). Saeid's article states that speaking and listening skills are closely related to everyday life. When students practice communicating, they not only apply their speaking and listening skills but also gain a concrete understanding of how communication actually works in real life. "...students need to practice speaking and listening to English following their field of study, so that they can benefit from the skills in their careers" (Amna & Christina, 2021). Amna & Christina state that students need to practice speaking and listening in English. According to the authors, these skills can benefit students in their future careers. Amna & Christina argue this because many English learners, even after years of study, still struggle to communicate fluently.

Because of the aforementioned research, the researchers chose the Listening and Speaking class. The researchers understand that both of these skills are essential for communication. Furthermore, this class urgently needs new teaching methods to create a conducive classroom atmosphere for both students and teachers. "...traditional English teaching methods often rely on prerecorded audio materials for listening training, as well as mechanically repeated dialogue exercises to improve oral communication. This single-

dimensional teaching method is no longer sufficient to meet learners' needs for a real language environment and personalized learning experience" (Zhu, 2025).

### **Methodology**

This research is a quantitative study. "The quantitative method is the collection and analysis of numerical data to answer scientific research questions" (Rana et al., 2023). Rana et al. state that quantitative research is a method in which data collection and analysis use numerical calculations through statistical analysis. Typically, absolute values can be demonstrated through statistical calculations. This study used a one-group pretest-posttest design. A one-group pretest-posttest research design is one in which the control group is given a treatment. Measurements will be taken before and after the treatment is administered to the control group (Barutu et al., 2023).

The researcher administers a pretest first. Afterward, the researcher teaches the Listening and Speaking material using the Reverse Whole Brain Model. Afterward, the researcher measures the extent of the changes experienced by the students by administering another posttest. The researcher compares the two tests to determine the extent of the differences using SPSS version 25. Both tests will be used as research data. The selected population is students from University X. The sample for this research is the Listening and Speaking II class students from the university.

The pretest and posttest scores will be analyzed using the Wilcoxon Signed-Rank Test (a nonparametric test). "The Wilcoxon signed-rank test, in contrast to the t-test, assumes the symmetry of differences between pairs rather than the assumption of normality. This test is particularly useful when comparing two related samples, matched samples, or performing multiple measurements on a single sample to see whether the population mean ranks differ" (Adegbaye & Adeoti, 2024). The researchers chose the Wilcoxon Signed-Rank Test (a nonparametric test) because it fits the requirements of the selected data sample. It is used to compare two tests (two related samples), to find the mean of the two tests (mean ranks), and to ensure the samples come from the same class (on a single sample).

## Result and Discussion

From the results of data collection through the pretest and posttest process, the scores of students in *the Listening and Speaking II* class were obtained

| No | Nama       | Pretest | Posttest |
|----|------------|---------|----------|
| 1  | Student 1  | 84      | 80       |
| 2  | Student 2  | 78      | 80       |
| 3  | Student 3  | 68,75   | 70       |
| 4  | Student 4  | 68,75   | 70       |
| 5  | Student 5  | 56,25   | 80       |
| 6  | Student 6  | 65      | 80       |
| 7  | Student 7  | 56,25   | 78       |
| 8  | Student 8  | 71,8    | 78       |
| 9  | Student 9  | 75      | 78       |
| 10 | Student 10 | 56,25   | 80       |
| 11 | Student 11 | 53,12   | 78       |
| 12 | Student 12 | 62,5    | 78       |
| 13 | Student 13 | 59,37   | 78       |
| 14 | Student 14 | 34,37   | 78       |
| 15 | Student 15 | 56      | 70       |
| 16 | Student 16 | 56      | 82       |
| 17 | Student 17 | 55      | 78       |
| 18 | Student 18 | 46,8    | 78       |

*Table 1 List of scores*

After the data collection process, the researcher proceeded to data analysis. In analyzing the data, the researcher began by conducting a normality test. This test aims to determine how the data are distributed.

### Tests of Normality

|                | Kolmogorov-Smirnov <sup>a</sup> |    |       | Shapiro-Wilk |    |      |
|----------------|---------------------------------|----|-------|--------------|----|------|
|                | Statistic                       | df | Sig.  | Statistic    | df | Sig. |
| Pretest model  | .164                            | 18 | .200* | .963         | 18 | .652 |
| Posttest model | .394                            | 18 | .000  | .717         | 18 | .000 |

\*. This is a lower bound of the true significance.

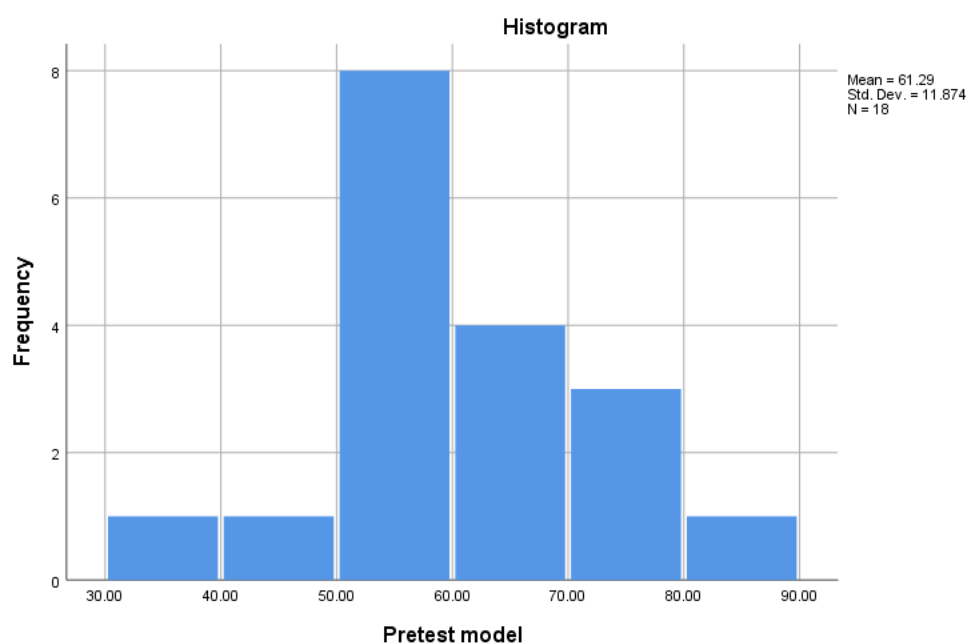
a. Lilliefors Significance Correction

*Table 2 Tests of Normality*

The normality test is a prerequisite for data analysis. The normality test determines whether the data is suitable and whether it is normally distributed (Sari et al., 2025). The normality test is used to determine whether the data is normally distributed. This determines whether to use parametric or non-parametric tests. From the data obtained by

the researcher through the pretest and posttest, the pretest sig value was 0.652, while the posttest sig value was 0.000.

The sig value requirement for the distribution of data that is considered normal is  $> 0.005$  (Sera et al., 2025). With this provision, the pretest data are considered normally distributed, with a sig value of 0.652. Value  $0.652 > 0.005$ . For posttest scores, with sig. 0.000, the data is considered to be abnormally distributed because  $0.000 < 0.005$ .



*Figure 2 Histogram Pretest*

From the histogram, the pretest distribution appears evenly distributed, but the posttest has some blank parts. That's why the normality test shows that the posttest distribution is uneven, given the data set. The next step is to use a nonparametric test, namely the Wilcoxon Signed-Rank Test.

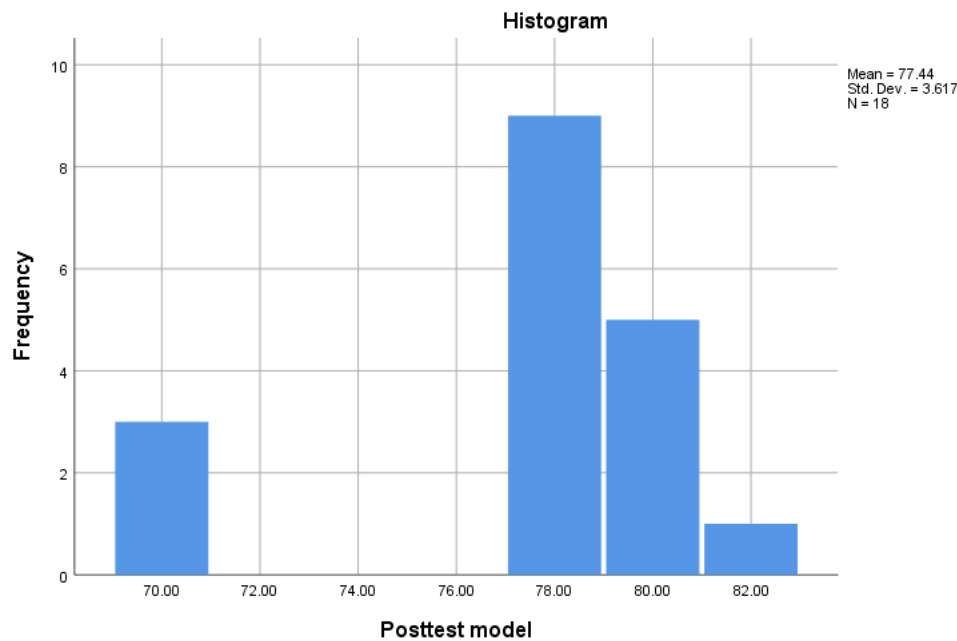


Figure 3 Histogram Posttest

“The Wilcoxon Signed Rank Test can be used to answer the hypothesis made by a researcher in their research report and is generally used in statistical calculations” (Sianipar, 2026b). In the Sianipar study, the Wilcoxon test was used to test the earlier hypothesis. “In the Wilcoxon signed rank test, variables are compared between abnormal returns before and after treatment is given” (Rahmalia et al., 2020). Because the data were not normally distributed, the researcher chose the Wilcoxon Signed Rank Test to analyze the pretest and posttest data and determine whether the model had an effect.

### Ranks

|                                |                | N               | Mean Rank | Sum of Ranks |
|--------------------------------|----------------|-----------------|-----------|--------------|
| Posttest model – Pretest model | Negative Ranks | 1 <sup>a</sup>  | 5.00      | 5.00         |
|                                | Positive Ranks | 17 <sup>b</sup> | 9.76      | 166.00       |
|                                | Ties           | 0 <sup>c</sup>  |           |              |
|                                | Total          | 18              |           |              |

a. Posttest model < Pretest model

b. Posttest model > Pretest model

c. Posttest model = Pretest model

Table 3 Ranks posttest-pretest

Negative ranks show a decrease in the mean and sum score. Negative ranks are used to see the difference (negatively) between the pretest and the posttest. The results show that 1 data point decreased by 5 points.

*Positive ranks* are used to see if there is a difference (positively) between the pretest and posttest scores. Positive rankings were observed in 17 data points from the total data obtained.

*Ties* are data points that have the same value between the pretest and posttest. From the calculations carried out, no data point produced the same value between the pretest and posttest.

#### Test Statistics<sup>a</sup>

|                        | Posttest model -<br>Pretest model |
|------------------------|-----------------------------------|
| Z                      | -3.507 <sup>b</sup>               |
| Asymp. Sig. (2-tailed) | .000                              |

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

*Table 4 Wilcoxon Signed-Rank Tests*

The basis for decision-making in the Wilcoxon Signed-Rank Test:

1. "If the Asymp.sig value (2-tailed) is smaller than  $<0.05$ ,  $H_a$  is accepted
  2. If the Asymp.sig value (2-tailed) is greater than  $>0.05$ ,  $H_a$  is rejected." (Sianipar, 2022).
- This is the basis for decision-making used by Sianipar in his research. From the calculation, as shown in the Test Statistics table, the value of Asymp. Sig. (2-tailed) is 0.000. Based on this, 0.000 is  $< 0.05$ . Because  $0.000 < 0.05$ , we conclude that  $H_a$  is accepted. From this description, it can be concluded that "there is an influence of the use of the *Reverse Whole Brain* model on students of the Listening and Speaking II classes at university X".

#### Discussion

Based on the analysis results, several points are discussed. The normality test results showed that the posttest data were non-normal, while the pretest data were normal. This may be because students were close together during the pretest. However, when viewed in the posttest section, the distances obtained are concentrated in one part of the score. Pretest scores are evenly distributed between 34.37 and 84. Posttest scores are spread from 70 to 82. The highest pretest score is 84, while the highest posttest score is 82. This distribution suggests an increase in grades in this group of students, especially among

those with low grades. This was created because, in *Reverse Whole Brain*, the teaching begins by touching the parts of the brain related to visuals and kinesthetics.

In the visual part, the teacher helps students understand the material through pictures related to the lesson. In teaching likes and dislikes, the teacher shows pictures of how a person expresses likes and dislikes toward something. The teacher also combines it with the kinesthetic part. Teachers build understanding by asking about students' experiences with things they like and dislike. From this, teachers also ask what students like and dislike. Teaching that touches on the visual and kinesthetic parts relies heavily on the teacher's ability to interact with students and to make them comfortable expressing what they understand and feel when asked what they like and don't like. If teachers have limited ability to interact, the comfort between students and teachers needed for the teaching to run well will not develop. This assumption is supported by the distribution of posttest scores.

*“The results show that the application of this model in the Listening and Speaking II class is considered by students who were also respondents to the questionnaire as an appropriate learning model”* (Sianipar, 2026a). To address these assumptions, Sianipar published an article discussing the effectiveness of the Reverse Whole Brain model based on student assessments. The article is titled ***“Overview of Neuroplasticity in the Application of the Reverse Whole Brain Model in College Students”***. The article describes the Reverse Whole Brain model based on the students' assessments. They feel that the model has helped them in teaching and learning in the classroom.

After the normality test, the researcher analyzed the data using a nonparametric test. Nonparametric tests were used because the data distribution was not normal. For this reason, the researcher chose the Wilcoxon Signed-Rank test. From the analysis results, the researcher identified key findings in the data set. *Negative Ranks*, *Positive Ranks*, and *ties* were obtained from the results of the analysis. In *Negative Ranks*, the mean and sum sections show 5, and the N section shows 1. This difference indicates a decrease. Thus, 1 data point decreased from pretest to posttest scores.

In the *positive ranks*, the mean was 9.76, the sum was 166, and N was 17. This shows that 17 data points have an average value of 9.76, with a total value of 166. These 17 data points have increased, so they are included in the *positive ranks* section. This means these 17 data points increased from pretest to posttest scores.

*Ties* indicate data that did not change, either increasing or decreasing. The results of the data analysis in this study show that no data remained unchanged. No data has the same value in the pretest or in the posttest. This shows that all data change from pretest values when compared to posttest values.

To make the decision in this section of the Wilcoxon Signed-Rank Test, we look at the value of Asymp. Sig. (2-Tailed). From the results, the value of Asymp. Sig. (2-Tailed) is 0.000. Since  $0.000 < 0.05$ , we reject  $H_0$ . This means that  $H_a$  is accepted. The Reverse Whole Brain model shows that teaching with the model has an influence.

From this data analysis, it can be concluded that the Reverse Whole Brain model influences learning outcomes. From the pretest and posttest carried out, it was found that there was a significant increase between the two sets of scores. The *Reverse Whole Brain* model appears to have improved students' learning outcomes in *the Listening and Speaking II* class.

## Conclusion

This research applies a new learning model. The model is called *the Reverse Whole Brain model*. This application is intended to introduce *the Reverse Whole Brain* model. The research was initially initiated from the 2025 Sianipar study, which conducted a systematic literature review of studies on the Whole Brain Model and linked them to studies on learners with Aphasia. The study concluded that children with aphasia need modified versions of the Whole Brain Model. This is because the initial Whole Brain Model starts with the left brain, even though children with aphasia have damage to the left brain. This modification is called the Reverse Whole Brain Model.

This study concluded that the Reverse Whole Brain model influenced students' learning outcomes in *the Listening and Speaking II* class. This influence is shown by the increase in posttest scores compared with pretest scores. This application also shows that one student's posttest score decreased compared with their pretest score. The results also emphasized that the abnormal distribution of posttest scores is caused by the fact that most values fall within certain ranges. This is due to the comfort students feel when teaching is carried out with this model. This comfort is also supported by the lecturer's approach when applying the Reverse Whole Brain model, which makes students feel

comfortable. Sianipar's 2026 research on the use of the Reverse Whole Brain Model, conducted using questionnaires, supports this. The results showed that students taught with the Reverse Whole Brain Model felt it was a suitable model to apply in *the Listening and Speaking II* class.

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