# A Brain-Compatible Learning Based Program to Develop Secondary School Students' EFL Reflective Reading skills

**Samar Mohamed M. Abd El Had*, Bahaa El-Din El -Sayed El-Naggar, Ahmed Abd El Salam Edress**

**TEFL, Department of Curriculum, Instruction, and Technology of Education, Faculty of Education, Zagazig University, Egypt.**

*Corresponding author: **Samar M. M. Abd El Had**, Email: Samarmohamed021@foe.zu edu.eg

***Received: 13-09-2024, Accepted: 29-10-2024, Published: 08-11-2024***

***ABSTRACT***

Investigating the impact of a brain-compatible learning program on the growth of secondary school students' EFL reflective reading abilities was the goal of this study. At the Kafr Saqr Secondary School for Girls in the Sharkia Governorate of Egypt, sixty second-year secondary school students participated in the study. The study's design was quasi-experimental. They were purposefully divided into two groups: a control group (n = 30) and an experimental group with 30 members. Pre-posttests and an EFL reflective reading skills questionnaire were created by the researcher in order to gather data. Regular training was used to teach the control group, whereas the brain-compatible learning program was used to teach the experimental group. The current study was carried out during the first term of the academic year (2024) for a period of twelve weeks, with a 60-minute session. Lastly, the study's findings demonstrated that the brain-compatible learning program significantly improved the EFL reflective reading abilities of second-year secondary school students.

**Keywords:** Brain-Compatible Learning, EFL Reflective Reading Skills, Students

## 1. Introduction

Reflective reading is one type of reading that helps learners become more aware of their surroundings by pushing them to think critically and see beyond the obvious. They are compelled to monitor their thoughts and evaluate what they read. It boosts their confidence, helps them better understand the questions they face, and inspire them to ask questions while they read. Apart from assisting students in altering their behavior, it also helps them understand the actual meaning of what they read, which enhances their ability to study on their own and deepens their understanding of the reading materials **(1)**.

In reflective reading, the teacher thinks about the text, dissects it into its component elements, and develops the strategies he needs to understand it until he reaches the conclusions the text requires. After that, the instructor evaluates the results using the plans he has made. In this way, he turns the reader from a passive information consumer into an active reader who can acquire unique and varied knowledge. Encourage them to read for pleasure and on their own, develop their mental and cognitive abilities, ask questions, acquire new insights, and become lifelong readers **(2)**.

## 2. Context of the Problem

As an EFL teacher, the researcher saw that secondary-stage students had low scores in the majority of reflective reading skills, and she studied the prior study that confirmed the persistence of EFL students' lack of reflective reading skills.

To document the problem, a group of fifteen second-year secondary school students took a pilot reflective reading skills exam. The findings showed that students were unable to evaluate the text's worth. They were unable to make logical deductions and discern between literal and inferred meanings. Additionally, they were unable to express ideas, draw analogies, deduce connections between occurrences, identify the information's source, and assess it. They were unable to decipher information by reading between the lines.

## 3. Statement of the problem

In light of reviewing the previous discussion, the pilot study and the researcher's experience in EFL teaching, it can be stated that secondary students are weak in EFL reflective reading skills results. The researcher proposed a new program to overcome such difficulties. It is a brain-compatible learning-based program that may develop EFL reflective reading skills of secondary school students. This led to the following questions:

**1)** What are the EFL reflective reading skills targeted for 2nd secondary school students?
**2)** What are the actual EFL reflective reading skills of 2nd secondary school students?
**3)** How can a brain-compatible learning-based program be designed to help develop EFL reflective reading skills of secondary school students?

## 4. Brain compatible learning

The human brain does not absorb direct instruction unless it makes sense to it because it is a dynamic system. It just chooses which information to accept, and each brain interprets what it accepts differently. The total quantity of past experiences stored in that particular brain has a greater impact on processing than the type of experience or how it was delivered by the teacher **(3)**.

Brain-compatible learning is the result of combining educational theory with neuroscience. Several brain-compatible learning principles were developed as a result of the study of real physiological changes in the brain (neuroscience) brought about by particular educational intrusions (educational psychology). The classroom has traditionally employed these brain-compatible learning strategies. According to Erlauer **(4)**, all successful teachers already use certain brain-compatible ideas.

One illustration of the student-centered approach is the brain-based learning methodology. A teacher who uses a brain-based approach helps pupils learn while also fostering a supportive learning environment and increasing student participation. This method aims to develop students' focus, comprehension, and long-term memory

for the lessons they are learning. It is founded on the ideas of brain-based learning that were created by **(5)**.

## 5. Reflective reading skills

There are several reasons why reading with reflection is vital. When it comes to educating people, it is far more effective than radios, televisions, and other multimedia. Through reading, students acquire the knowledge they require. Reading and academic achievement are strongly correlated, according to educational scholars. Students who value reading in their daily lives receive higher grades than their non-reading peers **(6)**.

Students try to tie occurrences to one another in order to find new meanings when they read to practise reflective thinking. According to Chi **(7)**, reflective reading helps students connect the dots between what they already know and what they are learning from a new experience. It also enables them to see new connections between things. To put it another way, it has evolved into the process of discovering this variety of meanings within texts. When readers take a moment to reflect, they are influenced to choose to employ the informational investigation and transformation of situations in which they find themselves.

## 6. The study design

Participants were split into two groups for the current study's quasi-experimental design, which served as a primary source of data (control and experimental). The control group received standard education, while the experimental group received brain-compatible learning.

### *The study participants*

Sixty second-year secondary students from Kafr Saqr Secondary School for Girls, Kafr Saqr Educational Directorate, Sharkia Governorate, who were enrolled in the second semester of the academic year (2024), participated. They were split up into a control group of thirty pupils and an experimental group of thirty students. Since the participants were purposefully chosen, it was considered that they made up a homogeneous group. Therefore, it was assumed that they would be similar in many ways and that their ages and experience levels would not differ significantly.

### *Instruments*

The instruments listed below were created, verified, and put into use.

1. To determine the appropriate subskills for second-year secondary school students, an EFL reflective reading questionnaire is required.
2. An actual instrument for determining the participants' level is an EFL reflective reading test.

### *Data analysis*

The study's hypotheses were tested using a t-test to see if there were any differences between the treatment group's mean scores on the EFL reflective reading skills test before and after administration. This was done in order to ascertain the impact of the brain-compatible learning-based program on the development of EFL reflective reading skills.

## 7. Verifying the study hypotheses

- ***The first hypothesis***

It was hypothesized that there is a statistically significant difference between the mean scores of the experimental and control groups on the post administration of the reflective reading skills test results, in favour of the experimental group ones. According to Table 1, the experimental group outperformed the control group in the EFL overall reflective reading skills and sub-skills. The t-values for the overall reflective reading skills (9.78), clarification (3.45), investigation (2.23), evaluation (4.23), and reflection (3.56) were all significant at the 0.01 level. This hypothesis was thus validated **(Table 1)**.

- ***The second hypothesis***

It was hypothesized that there is a statistically significant difference between the mean scores of the experimental group in the pre-posttest results of overall EFL reflective reading and its sub-skills, in the favour of the post-test ones. The experimental group's post-test mean scores were higher than the pre-test means for EFL reflective reading skills and its sub-skills. The t-values were 8.45 for overall EFL reflective reading skills, 3.54 for clarification, 4.99 for investigation, 5.17 for evaluation, and 3.54 for reflection; all were significant at the 0.01% level. This hypothesis was thus validated **(Table 2)**.

- ***The third hypothesis***

It was hypothesized that using the brain-compatible learning based program has a positive large effect on the experimental group students' EFL reflective reading skills. In the EFL overall reflective reading skills test, the experimental group's effect sizes were greater than the pre-group's. The effect sizes were (1.5) for overall reflective reading skills, (1.2) for clarification, (1.2) for investigation, (1.9) for evaluation, and (2.3) for reflection. All of these values were significant at the 0.01 level. Consequently, this hypothesis was validated **(Table 3)**.

**Table 1: Both groups post EFL reflective reading skills test results**

| Reflective reading sub-skills | Group | M | S.D | t-value | Sig |
|---|---|---|---|---|---|
| 1- Clarification | Control | 2.75 | 2.91 | 3.45 | 0.01 |
| | experimental | 6.00 | 3.23 | | |
| 2- Investigation | Control | 2.34 | 2.12 | 2.23 | 0.01 |
| | experimental | 6.16 | 3.45 | | |
| 3- Evaluation | Control | 3.32 | 1.23 | 4.23 | 0.01 |
| | experimental | 6.25 | 2.34 | | |
| 4- Reflection | Control | 2.76 | 2.81 | 3.56 | 0.01 |
| | experimental | 6.25 | 3.76 | | |

**Table 2: Comparing the pre-post reflective reading skills test results of the experimental group**

| Reflective reading sub-skills | Group | M | S.D | t-value | Sig |
|---|---|---|---|---|---|
| 1- Clarification | Pre-test | 2.90 | 1.53 | 3.54 | 0.01 |
| | Post-test | 6.00 | 3.23 | | |
| 2- Investigation | Pre-test | 2.80 | 2.55 | 4.99 | 0.01 |
| | Post-test | 6.10 | 3.45 | | |
| 3- Evaluation | Pre-test | 4.90 | 2.46 | 5.17 | 0.01 |
| | Post-test | 2.25 | 4.23 | | |
| 4- Reflection | Pre-test | 2.70 | 1.60 | 3.54 | 0.01 |
| | Post-test | 6.50 | 2.80 | | |
| Overall reflective reading test | Pre-test | 11.90 | 2.62 | 8.45 | 0.01 |
| | Post-test | 24.90 | 5.23 | | |

**Table 3: The effect sizes of the experimental group in the EFL reflective reading skills in the pre-posttest results**

| Reflective Reading Sub-Skills | Test | M | S.D | Eta square | Effect size |
|---|---|---|---|---|---|
| 1- Clarification | Pre-test | 2.9 | 1.53 | 0.85 | Very large 1.2 |
| | Post-test | 6.0 | 3.23 | | |
| 2- Investigation | Pre-test | 2.8 | 2.55 | 0.8 | Very large 1.2 |
| | Post-test | 6.1 | 3.45 | | |

| | | | | | |
|---|---|---|---|---|---|
| **3- Evaluation** | **Pre-test** | **4.9** | **2.46** | **0.99** | **Huge 1.9** |
| | **Post-test** | **2.25** | **4.23** | | |
| **4-Reflection** | **Pre-test** | **2.7** | **1.60** | **0.95** | **Huge 2.3** |
| | **Post-test** | **6.5** | **2.80** | | |
| **Overall reflective reading skills test** | **Pre-test** | **11.9** | **2.62** | **.095** | **Huge 1.5** |
| | **Post-test** | **24.9** | **5.23** | | |

***Significant at (0, 01)***

## 8. Results of the study

The following outcomes could arise from reporting the statistical tables:

1. The experimental group did better than the control group on the EFL reflective reading skills test after it was administered.
2. According to the findings of the EFL reflective reading skills test, the post-administration performed better than the pre-administration.
3. The brain-compatible learning based program had a large effect size on the experimental participants' overall main skills of EFL reflective reading skills test results.

## 9. Conclusion &Recommendations

The brain-compatible learning program significantly improved the EFL reflective reading abilities of second-year secondary school students.

The current study made the following recommendations based on its findings and findings:

**1-** To teach EFL reflective reading, EFL secondary teachers must be trained in appropriate activities and procedures.

**2-** More time in English language teaching should be spent to strengthen the learners' EFL reflective reading skills.

**3-** Secondary EFL teachers should be encouraged by their supervisors to focus on their students' EFL reflective reading abilities.

**4-** Checklists of the essential EFL reflective reading abilities and instructions for practical exercises to develop them should be included in the teacher's handbook.

**5-** By using brain-compatible learning methodologies, teachers can shift their roles from being the sole information provider to that of a facilitator, guide, monitor, and consultant.

**6-** Students should be grouped in EFL classes according to several criteria, such as individuals, couples, small groups, or the entire class.

**7-** EFL secondary instructors should receive training on a variety of assessment techniques, including participation, group activities, speeches, presentations, and self-evaluation.

**Conflict of interest:** The authors declare no conflict of interest.
**Sources of funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
**Author contribution:** Authors contributed equally in the study.

## 10. References:

1- **Al-Shammari, N. (2019).** *Exploring the teaching practicum experiences of Saudi student teachers of Arabic*. University of Exeter (United Kingdom).
2- **Davis, D. A., & Craven, C. (2022)**. *Feminist ethnography: Thinking through methodologies, challenges, and possibilities*. Rowman & Littlefield.
3- **Hart, L. (1983)**. *A Quick Tour of the Brain. School Administrator, 40(1), 13-15.*
4- **Erlauer, L. (2003).** *The brain-compatible classroom: Using what we know about learning to improve teaching*. ASCD.
5- **Ramakrishnan, J., Annakodi, R. (2013)**. *Brain based learning strategies. International journal of innovative research & studies, 2(5), 235-242.*
6- **Shoebottom, P. (2007)**. *The importance of reading (a guide to learning English). Viewed on December, 4, 2011.*
7- **Chi, A. L. (2023)**. *Reflective Practice: Tools and Challenges in Difficult Contexts. Canadian Journal of Language and Literature Studies, 3(4), 1-16.*