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The effect of right and left brain dominance in language learning

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Abstract

The purpose of this study is to determine the effects of right and left brain dominance on students' academic achievement and learning English. Language classrooms consist of students who have different learning styles and these learning styles are related with the dominance of right or left brain. This has a great impact during the learning process. Therefore, having an idea about the brain dominance of the students is important. If the teacher knows his or her students well, he or she can use the methods, techniques and materials adequately. This research will provide the teachers to find out the dominant part of their students' brains and use the appropriate classroom techniques, methods and tools according to them. It will also give the opportunity of finding out the teachers' brain dominance to help him / her to be aware of his / her teaching style.

Keywords: brain dominance, brain dominance in language learning, learning styles, right and left brain

1. Introduction

The aim of the research was to find answers to the questions below:
- What is the brain dominance of each student?
- What is the brain dominance of each English teacher who participated during the study?
- Does the brain dominance effect the students' academic achievement in the English lesson?

The participants in this study comprised of a group including two classes which had 43 5th grade students at a private school. There were 21 students in one class and 22 in the other one.

First of all, each student was given a right brain / left brain dominance quiz (Education World, 2000) to find out the dominant part of the brain. It had ten questions with two options. The students read and circled one of the options. Then the English teacher of each classroom was given a quiz which invents the learning styles to find out the dominant brain. The quiz had 20 questions with a 'Yes' or 'No' answer. The aim of giving a similar test to each teacher was to help him / her to be aware of his / her teaching style so he / she can complete the missing parts of his / her teaching style.

Next, the results of brain dominance tests in two classrooms were compared. According to these results, the best ways to teach and practice English were found out. Also, the results of each part including reading, vocabulary, use of English and writing in students' English exams were compared with the results of brain dominance test.

The above plan required the researcher to do the research approximately 10 days. The data analysis for this research was conducted by using Microsoft Office Excel.

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2. Literature Review

Brain functions and the effect of them in learning English have always been one of the researcher's favourite spheres of interest. Being an English teacher, she was intrigued when she first heard about a connection between brain dominance and learning English in one of Gulfem Aslan's (1999) seminars she attended. With her and her colleague's 5th grade students in mind, she became curious as to the effects of right or left brain dominance could have on the students' academic achievement in learning English.

Much of the theory of left and right specialization has been developed through examining some patients. The brains of these patients were damaged because of some accidents. The ones who had a damage on the left hemisphere showed that the processing of language reside in the left hemisphere.

Morris (2005) stated that Dr. Roger W. Sperry, a Nobel prize winner, conducted a research to see what happens when the parts which connects left and right hemisphere is cut. Morris (2005) found the following:

"A typical result of this research involved presenting an image to the left eye [connected to right hand side of the brain], the patient would be unable to say the name of the object [using language centres in the left hemisphere], but could pick out a similar object with the left hand [right hemisphere]. Perhaps the most intriguing split brain research was with a patient of another pair of split brain researcher, Michael Gazzaniga and Joseph LeDoux, who had some limited language facilities in his right brain. This patient showed marked preferences in responses from the two hemispheres. When asked, 'What do you want to do?' the left hemisphere replied 'draftsman', but the right hemisphere [using scrabble letters] replied 'automobile race'. The overall results of Sperry's research can be summarised by his quote: 'Everything we have seen indicates that the surgery has left these people with two separate minds. That is, two separate spheres of consciousnesses."(p. 17)

The results of this research indicated that there are specific differences between the two hemispheres. The right brain is better at copying of designs, discrimination of shapes, understanding geometric properties, reading faces, music, global holistic processing, understanding metaphors, expressing emotions and reading emotions. The left brain is better at language skills, skilled movement and analytical time sequence processing.

Morris (2005) indicated that Ned Hermann who is the father of brain dominance technology drew on Sperry's work and developed the theory. He then went onto develop a questionnaire. It is called "Hermann Brain Dominance Instrument (HBDI)". By this model the brain is divided into four different systems and styles which are listed below:

A: Left cerebral hemisphere – analytical
B: Left limbic system – sequential
C: Right limbic system – interpersonal
D: Right cerebral hemisphere – imaginative

According to the notes of Morris (2005), "A related but independent theory is the theory of Multiple Intelligences developed by Howard Gardner (1983). Here he identified seven types of intelligence:

- Verbal-linguistic,
- Logical-mathematical,
- Visual-spatial,
- Body-kinesthetic,
- Auditory-musical,
- Inter-personal communication,
- Intra-personal communication,

Gardner later added Naturalist Intelligence and Existentialist Intelligence. Whilst Gardner had a background in neuro-psychology he does not appear to make any specific links between brain science and his theories. Gardner is a strong believer in the plurality of intelligences and does not consider these to be the definitive set. He is also keen to differentiate intelligences from learning styles. David Lazear's 'Eight Ways of Knowing' expands upon this theme giving many sample exercises for each mode, as well as a rather uncritical review of the literature. The visual-spatial seems to have some aspect of right brain styles. (….) The VARK [Visual Auditory Reading Kinesthetic] is another related model. Whilst this shows some characteristics of a left-right distinction, such as the presence of Visual and

Kinesthetic components associated with the right hemisphere, it is more a model of perceptual style rather than cognitive style. It does not address the different modes of thinking exhibited by sequential / holistic styles." (p. 30)

All these models and researches take people's attention on some aspects of the left-right specialization. Morris (2005) pointed out that the idea that the left and right hemispheres exhibit different patterns of thought has caught the public attention and have inspired several educational theories.

Most of the traditional educators give lessons without considering the different interests of the learners in homogenous learning groups. However, better and greater learning can be accomplished if they take the learners' different interests and aptitudes into consideration as a heterogeneous group.

Many teachers have difficulties with some children such as keeping them still and focused, finishing assignments, keeping organized, grasping concepts the way they are taught. In 2006, Morris described the reasons specifically related with the dominant side of the brain. He also added that left brained children have analytical thinking. They make lists and schedules. They always want to know the rules and follow them. They take in information through analysis, observation and thinking. They have little trouble expressing themselves in words. They are precise in choosing words. Their language abilities are so refined. They are also good at processing symbols and mathematical formulas. Right brained ones use mostly their feelings about something to decide if it is true or not. Their minds move rapidly from one thought to another and this causes difficulties in finishing the assignments. They are holistic learners that they need to see the whole picture then examine and learn about all the parts that create the whole. They are creative and imaginative. Singing, music, art, writing, designing, anything creatively based are easy for them. They view their opinions through their own personal experiences and backgrounds. Right brained children know exactly what they mean but have trouble finding the words to express. They are visual learners who can see a three dimensional image in their minds. They like things to be concrete so they like to see, feel or touch the real object.

There are also whole brained children who use many of the above strategies for learning. The right brained ones may also have left brained tendencies or vice versa.

Morris (2006) also focused on the teaching strategies in schools. He mentioned that traditional schooling tends to favor left brained people. The students are usually taught mostly by left brained teachers, who themselves love order, sequence and planning. Right brained learners do not always get the rewards or understanding of a different way to process information.

Revell (1992) stated that we all live in a society which tends to respect and nurture the left brain more than the right. When children get older, the educational systems often teach them that remembering facts is more important than being creative and imaginative. Their right brains are appealed to less and less and their left brains more and more. It is the right side that controls the emotions so social relationships become less harmonious. Then it becomes more difficult to solve problems in a holistic way. Creativity is seriously impaired. Revell focused on maximizing the power of the brain as a whole and working in better balance as a treatment. Revell added that this is only possible if teachers balance the four skills and balance learner-centered and teacher centered activities.

Saleh (2001) conducted a study on brain hemisphericity. He stated that "studies have suggested that brain hemisphericity is associated with different occupations and academic majors [Kolb, 1979; McCarthy, 1996]. Kolb believed people choose majors / fields based on congruence between their learning styles and the norms of those majors / fields [1979]. People choose their academic majors based on the compatibility between the norms of these disciplinary fields and the individual's hemispheric dominance [Kolb, 1979; Gordon & Coscarelli, 1986; Rowe, Waters, Thompson, & Hanson, 1992]. Academic subjects such as arts, the humanities, and architecture are believed by several researchers to require a more global, synthetic, and spatial orientation which make them more suitable for right-brain dominant students, whereas other subjects such as science, engineering, and language emphasize logic and verbal analysis, which make them a better fit for left-brain dominant students [Coulson & Strickland, 1986; Herrman, 1982; Katz, 1983]. Lavach [1991] examined the brain hemisphericity of students with different majors. He reported that humanities students showed preference for the right-hemispheric dominance. Natural science students demonstrated a left-hemispheric mode, while social science majors showed preference for left-hemispheric dominance." (p. 7)

In his study, Saleh (2001) investigated the correlation between students' choice of academic majors and their brain hemisphericity. There were 429 graduate and undergraduate students in a large university in the southern part of the United States as participants. . They were selected randomly. 402 of the students were undergraduates and 27 were graduates. The number of females in this sample was twice the number of males. The data were collected over a period of two years. The participants were asked to complete a demographic survey. It was the Hemispheric Mode Indicator (HMI) of McCarthy (1987). It measured the preference in the individual's approach to learning with a bias for right, left or whole brain-mode processing techniques.

(….) "The instrument has 32 items; each item consists of a continuum between two adjectives, such as 'neat' and 'sloppy'. On the continuum, there are four choices, the subject either chooses 'a lot' or 'somewhat' from one side of the continuum or 'a lot' or 'somewhat' from the other side of the continuum. The participant chooses one adjective and the degree to which he / she exhibits this characteristic for each item and then self scores the questionnaire. The high negative scores on the HMI continuum are associated with a left hemispheric mode, and the high positive scores are associated with a right hemispheric mode. Scores between -8 and +8 on the continuum are associated with whole-brain dominance. To be able to code and enter the data in the computer program for the statistical analyses in this study, negative and positive scores were converted into all positive scores. Scores below 72 were viewed as left hemispheric dominance, while scores above 80 were viewed as right hemispheric dominance. Scores in the range of 72 to 80 are considered balanced hemisphericity [whole brained]." (Saleh, 2001, p. 9)

To determine the influence of brain hemisphericity on students' choice of academic majors ANOVA was used. SPSS and SAS computerized statistical programs were employed.

The results showed that there was a significant difference between arts and literature majors and business majors. Arts and literature majors showed a right brain tendency whereas business and commerce students showed a left brain tendency. Students majoring in education showed a tendency toward right-hemispheric dominance but business and commerce majors showed a tendency toward left-hemispheric dominance. Nursing, communication and law students showed a tendency toward right-hemispheric dominance while engineering, science, business and commerce students showed a tendency toward left- hemispheric dominance.

In contrast to all, Gabriel (2007) focused on the lack of evidence of creativity in the right brain. He stated that the right brain is artistic, musical, spatial, intuitive, and holistic; the left brain is linear, rational, analytical, and linguistic. There is some truth in these labels. But, not surprisingly, they are mostly oversimplifications of tendencies, not fixed rules.

"(….) On the subject of creativity and language-two skills often polarized as examples of right and left brain thinking-Corballis said, 'I don't see any good evidence that the right hemisphere is more creative than the left. Language itself is highly creative-every sentence you construct is a new creation-and one could make a case for supposing that the left hemisphere is really the creative one.' He goes on, 'But I think artistic creativity is likely to invoke more right-hemisphere capacities, simply because of the right- hemisphere bias for spatial skills. And there are aspects of language, such as prosody, and perhaps pragmatic aspects such as an understanding of metaphor or sarcasm, that may be more right than left hemispheric. So it's always a question of balance." (Gabriel, 2007, p. 5).

3. The Present Study

In general, schools tend to favor left – brain modes of thinking, and they mostly ignore the right – brain ones. In order to be more whole – brained, schools need to give equal weight to the talents and skills referring to both right and left brains. Therefore, it is important for tutors to have enough information about their students. This will help them to give activities to fill the gaps of the students by using methods and techniques that connect both sides of the brain.

It is also important for tutors to be aware of their own brain dominance because they may have a tendency to teach to their own dominance.

Because of these reasons the present study proposes the following research questions:

1. What is the brain dominance of each student?
2. What is the brain dominance of each English teacher who participated during the study?

3. Does the brain dominance effect the students' academic achievement in the English lesson?

Two classes of English learners were involved in the study. The classes were named as A and B. They were given the right brain / left brain dominance quiz (Education World, 2000). The students were informed about how to do the quiz. Details are provided in the following sections.

4. Methodology

4.1. Participants

The participants in this study consisted of a group including two classes which have 43 5th grade students at a private school. Class A contained 21 students and class B contained 22 students. Both of the classrooms contained mixed-ability students with lower, middle and upper English levels came from different schools. 4 students in class A and 2 students in class B attended the school and started to learn English 3 months ago. They all came from different state schools located in a large urban area. According to the detailed lists the researcher found in the archive files of the Foreign Languages Department, 7 students in Class A and 9 students in Class B had been learning English for two years. The other 10 students in Class A and 11 students in Class B started to learn English in the kindergarten. These clearly show that all the students were exposed to different ways and approaches of different English teachers to learn English.

4.2. Procedures

First of all, the researcher gave students a right brain / left brain dominance quiz (Education World, 2000) to find out the dominant part of the brain. This was the first research question asked. The quiz had ten questions with two options. The students read and circled one of the options. Then to find an answer to the second question, the English teacher of each classroom was given a quiz (Morris, 2006) which invents the learning styles to find out the dominant brain. This quiz had 20 questions with a 'Yes' or 'No' answer. The aim of giving a similar test to each teacher was to help him / her to be aware of his / her teaching style so he / she can complete the missing parts of his / her teaching style.

To assess the third research question, the researcher compared the results of an English exam the students took before with the brain dominance of the students. The English exam consisted of parts including reading, vocabulary, use of English and writing. Reading and Use of English parts in this exam provided the researcher to measure the left brain dominance whereas vocabulary and writing parts included tasks that measured the right brain dominance.

4.3. Data Analysis

To find out the brain dominance of the students it was referred to the scoring procedure in the Right Brain – Left Brain Dominance Answer Key (Education World, 2000).

According to this procedure, the total scores were found as in the table below:

Table 1. Scoring Procedure

Question 1. Faces=right-brain behaviour; Names=left-brain behaviour
Question 2. Spontaneous=right-brain behaviour; Organized=left-brain behaviour
Question 3. Fantasy=right-brain behaviour; Realistic=left-brain behaviour
Question 4. Intuition=right-brain behaviour; Logic=left-brain behaviour
Question 5. Open-ended=right-brain behaviour; Well-structured=left-brain behaviour
Question 6. Pictures=right-brain behaviour; Language=left-brain behaviour
Question 7. Creative=right-brain behaviour; Not creative=left brain behaviour
Question 8. Humorous=right-brain behaviour; Serious=left-brain behaviour
Question 9. Main idea and overview=right-brain behaviour; Details and facts=left-brain behaviour
Question 10. Exploration=right-brain behaviour; Systematic plans=left-brain behaviour.
Total Score: _____ Right-Brain Responses; _____ Left-Brain Responses _____

Next, the total score of the students were compared with the Vocabulary and Writing parts and Use of English and Reading parts of the students' English exam. The data analysis for this part of the research was conducted by using Microsoft Office Excel.

To find out the results of the Learning Style Inventory quiz (Freed, 1997) given to the teachers, "Yes" and "No" answers were counted. The more "Yes" responses, the more to the right the teacher was on this continuum. In the scoring procedure, the details below were given. In general:

0-4 yes responses indicates a very left dominant brain
5-8 somewhat left brained
9-12 considered whole brained, using both hemispheres
13-16 somewhat, preference for, right brained
17-20 VERY right brained

4.4. Results

According to the results of the right brain – left brain quiz 12 of the students are right brained, 5 of the students are left brained and 4 of the students are whole brained in Class A. In Class B, 14 students are right brained, 6 students are left brained and 2 students are whole brained. (See Figure 1)

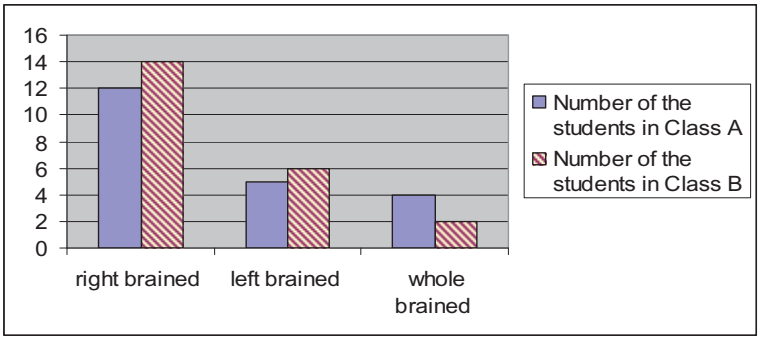

Figure 1. The brain dominance of the students in Class A and Class B.

It was also found out that the teacher of Class A had 16 "Yes" answers so she is right brained whereas the teacher of Class B had 7 "Yes" answers so she is left brained according to the results of Learning Styles Inventory (Morris, 2006). Feedback was given to both of them about the results so they could take it into consideration in their lessons to connect both sides of the brain.

Finally, brain dominance quiz of the students were compared with the mean of the specific parts in the English exams the students took. The mean of each part corresponding to the brain dominance is given in a table. (See Table 2).

Table 2. The comparison of the brain dominance with the parts of the English exam.

	Class	Mean of the Vocabulary and Writing parts	Mean of the Use of English and Reading parts
Right Brained	A	80,66	54,66
students	B	76,84	52,84
Left Brained	A	42,33	64,66
students	B	36,12	72,54
Whole Brained	A	76,15	70,22
students	B	68,26	64,54

5. Conclusion and Discussion

Right brained students who were good at responding demonstrating instructions and visuals showed a good performance in the Vocabulary part. As being open to open ended questions they were also good at the writing part. Left brained students, who were good at problem solving by logic and who can see the differences, did well in the Use of English and Reading parts.

Whole brained students' exam results seemed to be balanced because they could use both sides of their brains nearly equally.

All the results of this study indicate that the brain dominance effects the achievement of the students in the English classroom. Taking all these into consideration teachers can find the efficient strategies for their own classrooms. Therefore, teachers can also find out what kind of activities the students need to improve the part of their brain apart from the dominant one.

Being aware of own brain dominance will also help the teacher not to teach only through his / her own dominance.

By finding out the brain dominance of the students and giving activities according to them, the teacher might also improve the efficiency of his or her own teaching, increase the success rate and also advise the students on learning strategies and recalling.

All these information can serve teachers to make sure that they appeal to all learners with different brain dominances and provide their learners experiences with all three modalities. They should find a way to combine all three to make their learners enhance, to create the right atmosphere to make learning easier and more enjoyable and to help students to reinforce their knowledge with meaningful activities.

Appendix

Merve Oflaz (b.1976) received her B.A. in Teaching English as a Foreign Language at The Institute of Educational Sciences at Marmara University in 1998 and her M.A. on Teaching English as a Foreign Language at Yeditepe University in 2008. She attended many seminars and workshops on ELT. She received an award in the British Council Advantage Competition 2009 on 'The Best Lesson I've ever had' and she won 'My Favourite Lesson Activity' Competition of British Council in May 2009. She got a plaque for the workshop she led at ISTEK ELT Conference in August 2009. She was also given a certificate of 'Appreciation and recognition for taking on the role of associate teacher' from Ontario University in the year 2008. She obtained an Award of Service in May 2005 and an Award of Talented Teachers in May 2000 from İSTEK Atanur Oguz Schools. She has been teaching English for thirteen years. Currently she is an instructor at ISTEK Acibadem Schools.

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