

Conference Paper

The Effectiveness of Brain Gym Games in Optimizing the Right and Left Sides of Students' Brains

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Abstract

Successfully optimizing the right and left sides of the brain can help to improve intelligence, logic and social intelligence. This study aimed to determine the effectiveness of the brain gym game in optimizing the right and left sides of students' brains. A quantitative approach was used with a pretest/posttest design. Random sampling was used to recruit participants and the sample consisted of 53 students at XI MIPA Senior High School. The results showed that the brain gym game was effective in optimizing students' right and left sides of the brain. Based on these results, innovation is recommended that contributes to the novelty of guidance and counseling media using the brain gym game to reflect on the functions of students' right and left sides of the brain.

Keywords: brain gym games, right brain, left brain

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1. Introduction

In the learning process, there are various behaviors, individual traits or potentials that affect children's development. There are many obstacles that often affect children's development so that children can't fulfill their development optimally, such as the school environment, children have to grapple with various goals and learning agendas by forcing the brain to work very hard, so there will be an imbalance in the brain between the right brain and left brain, can also cause fatigue in the brain so that children's learning intelligence decrease, [1]. The brain processes all kinds of information it receives. Emotions, concentrations, and all stressful conditions that occur in a person can be rooted in the balance of the brain. So that students in developing their cognitive need skills that can optimize the work of the brain, [2].

Teachers have an important role in educating the nation's children. The formation of student character in schools is part of the guidance and counseling teacher's duties.

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In addition to facilitating students, guidance and counseling teachers, assist students to grow up, and become a center for information including recognizing their talents, interests and learning abilities, [3]. Guidance and counseling teachers often find various problems in the school environment both personal, social, career and learning problems, [4]. The current education system that only focus on the outer left brain and does not balance with the use of the right brain. The left brain plays a dominant role in the processing of logic, words, mathematics, and sequences for academic learning. The right brain that deals with musical rhythm, images, and creative imagination have not got a proportionate share to be developed, [5]. The problem that most often occurs in schools in Indonesia is known since 2018, namely learning problems, where most of students go through learning stress, [6]. The cause of stress in Indonesia reaches 82.8% which comes from very busy children's routines, [7]. Learning barriers are associated with an overcrowded learning agenda that forces the brain to work very hard. These all result an imbalance of the brain, namely between the right brain and the left brain, it can also cause fatigue in the brain so that children's learning intelligence decreases, [8]. Learning problems that are often encountered among students, namely boredom of learning are triggered by a lot of pressure, which cause brain function is weak. This encourages guidance and counseling teachers to be obliged to help students in an effort to balance the right brain and left brain.

The balance of the right brain and left brain has benefits for individuals. Individuals who have a balance of the brain have the advantage of not only excelling academically but also having an influence on their social life, [9]. The ability to balance the right brain and left brain performance makes intelligence more perfect, logical, and social intelligent to prepare society 5.0 for the improvement of people's lives, [10]. Not everyone can balance the right brain and left brain because it dominates one of the right or left brain, [11]. Brain imbalance is one of the triggers for boredom of learning, unfocus, and others, [12]. One method that can optimize the balance of the brain is the brain gym game.

The brain gym is a collection of simple movements that aim to connect the mind and body, [13]. Based on the research, [14] that students who took part in brain gym-based learning had a higher average cognitive learning outcome than students who took learning without a brain gym. Brain gym can be done to refresh students' physical and mind after undergoing a learning process that requires high concentration which results in fatigue in the brain, [15]. Brain gym is useful to increase the creativity of teachers including guidance and counseling teachers in creating a more enjoyable learning atmosphere, reducing learning tension through natural touches through movement, [16].

The brain gym can cause functions between the right and left brains to work together so that it can strengthen the relationship between the two hemispheres of the brain before being used in various activities, [17]. That way, the brain gym is expected to be able to help students' problems at school by reducing boredom of learning and restoring the balance of the right and left brain.

This phenomenon is one of the researchers' interests in researching students of Senior High School number 18 Palembang. Researchers make observations to see the conditions that occur at school. Based on the results of observations, there is boredom in learning and learning stress experienced by students and more optimizing the left brain without optimizing the right side of the brain. In short, the characteristics of the left brain are academic and intellectual, while the characteristics of the right brain are artistic, creative, and instinctive. Researchers observed that students had not utilized their potential and had not taken advantage of activities that used the right brain in the learning process. Students at Senior High School number 18 Palembang, follow the system established by the government which states that schools have currently implemented a "full-day school" system, meaning the learning process starts from morning to evening. As a result, it raises a tendency to decrease student learning concentration. Also, researchers conducted interviews with counseling teachers at Senior High School number 18 Palembang. The results obtained from the learning problems commonly experienced by students, guidance, and counseling teachers only provide individual counseling services and group guidance and that too is not routine. Besides, the results of a study on the needs of students in schools using a questionnaire saw how the balance of the students' right and left brains obtained that the students' left and right brain balance was low (55%), the students' right and left brain balance was classified as moderate (15%), while the balance The students' left and right brains were high (30%).

In line with data from preliminary studies that have been conducted by researchers, there is support from previous research results, namely brain exercise shows a positive impact to increase concentration in learning and reduce learning boredom, [18]. Further research, brain exercise can reduce anxiety, [19]. Also, other studies have shown brain exercise to be effective in dealing with stress, [20]. Given the many positive impacts of using brain exercise, researchers are interested in conducting a study entitled "the effectiveness of brain gym games in optimizing the right brain and left brain of students in Senior High School number 18 Palembang". Researchers hope that the Brain Gym game can provide benefits for students and teachers in optimizing brain balance for high school students.

2. Related Works/Literature Review

2.1. Brain Gym Games

Brain gym games are exercises that can be used to facilitate learning in various academic fields such as reading skills, oral reading, reading comprehension, thinking skills, spelling, mathematics, creative writing, listening and thinking, sports and play, memory, abstract thinking, thinking creative, speed reading, and taking tests, [21]. An activity that is carried out together using simple body movements in a fun way to stimulate the blocked parts of the brain so that they can function optimally.

The brain gym is a series of simple body-based exercises, [22]. The brain gym is a very effective learning, [23]. Brain gym can facilitate learning activities and make adjustments to the tensions, challenges, and demands of everyday life. Brain exercise is useful for training the brain, [24]. Brain exercise will make the brain work or activity.

2.2. Right Brain and Left Brain

The right brain is concerned with artistic and creative development, feelings, language style, musical rhythm, imagination, daydreams, colors, self-recognition, and other people, socialization, and personality development, [25]. Meanwhile, the left brain is a place to perform academic functions such as reading-writing-arithmetic, memory (names, times, and events), logic, and analysis, [26]. The challenge faced is how to implement an education system that allows the optimization of the entire brain so that the reception, processing, storage, and use of information to occur efficiently. [27]. For this reason, the human brain needs to be invited to exercise to nourish and optimize brain function.

3. Material & Methodology

3.1. Research methods

The research method used is a quantitative method with the type of pre-experimental. The determination is adjusted to certain criteria to be studied, [28]. The research design used was one group pretest and posttest design, namely a quasi-experimental design using one experimental group and a control group.

The population in this study were all students of class XI MIPA at senior high school number 18 Palembang, amounting to 116 people (Data Source: administration staff at senior high school 18 Palembang for the academic year 2016/2017) and the sample is

part or representative of the population studied, [29]. From the total population of all class XI MIPA, the sampling technique in this study was carried out randomly (random sampling), namely the author took each class randomly. As for measuring the sample size, according to [30] Slovin formula can be used and the results in this study are a sample size of 53 students.

Data collection techniques using observation, interviews, documentation, and questionnaires were carried out during the study at school to support data collection. The instrument made through the validity using the validity test using the product-moment correlation formula is used to measure the validity of an instrument, while the instrument reliability test is carried out using internal consistency with the split-half technique which is analyzed using the Spearman-Brown formula. The validity of the questionnaire instrument was tested using the validity and reliability test which is useful for seeing how valid the questionnaire items were distributed to respondents with a significant level of 5% presented with a table for testing the questionnaire items for the independent variable question number 1 with a total of 30 respondents 18 items declared valid and 2 items were declared invalid. The researchers obtained this data by distributing questionnaires to the students who were the samples. The data collection in this study was by distributing questionnaires as many as 53 students consisting of class XI IPA 1, XI IPA 2, XI IPA 3, XI IPA 4. The questionnaire that the researchers used in this study were a closed questionnaire which was then given to students or respondents who be the sample in this study.

4. Results and Discussion

Based on the result of the observations, the phenomenon that occurs in school is that there is boredom of learning and learning stress experienced by students and optimizes the left brain without optimizing the right brain. In short, the characteristics of the left brain are academic and intellectual, while the characteristics of the right brain are artistic, creative, and instinctive. Researchers observed that students had not utilized their potential and had not taken advantage of activities by emphasizing the use of the right brain in the learning process. The purpose of the brain gym game is to practice simple movements that are used to facilitate learning activities and adapt to daily demands. This movement is trained to stimulate the right brain and left brain, lighten or relax and develop the potential possessed by students. In this study, if the functions of the right brain and left brain are balanced, there will certainly be individuals who are not only successful in academics, but also in social problems. This means that

people successfully optimize the ability of the right brain and left brain, their intelligence will be perfect, logical and social smart.

Researchers conducted research starting from June 5th-31st 2017, consisting of initial observations, further observation to the class that was used as the population and sample, as well as conducting good consultation and communication with the school, distributing questionnaire instruments, distributing questionnaires, and providing services in the form of services classical guidance. The research activity began on Monday, June 5th 2017, the researchers made preliminary observations on the state of the school. Followed by Saturday, June 17th-20th 2017, again made further observations to the class that was used as the research sample, as well as conducting consultations and communicating well with the school. Then on Wednesday, June 20th 2017, the researchers distributed a test questionnaire instrument to 30 respondents outside the sample and established good communication and approach with respondents. Then it was continued on July 17th 2017, to again ask for permission to distribute valid and reliable questionnaires, then on July 18th 2017 came back to school and had not got the right time, and on July, 20th 2016 to distribute valid and reliable questionnaires to 53 research samples ended with distributing questionnaires, providing classical guidance services for 3 meetings and the research was ended on 31st of July 2017. This research was conducted to determine the effectiveness of the brain gym game in optimizing the left and right brains of students at senior high school number 18 Palembang. Based on the data obtained from the results of distributing questionnaires consisting of 18 items of the right brain and left brain to 53 respondents consisting of pre-test and post-test, it shows that there is a difference between before and after giving the brain gym game in balancing the students' right and left brain. Then proved by analyzing using the t-test formula.

Based on the data obtained from the results of distributing questionnaires consisting of 18 items of right brain and left brain to 53 respondents consisting of pre-test and post-test, it shows that there is a difference between before and after giving the brain gym game in optimizing students' right and left brain. Then proved by analyzing using the t-test formula.

Based on the results of the t_{count} value then compared with the t_{table} value. To get the value of t_{table} with $dk = n-1$ or $dk = 53-1 = 52$, if the error is set to 5%, then we get $t_{table} = 1,68$. Based on the value of t_{count} above, it is obtained at 10,90 while t_{table} is 1,68 or in other words, $t_{count} > t_{table} = 10,90 > 1,68$. Thus, H_a is accepted and H_0 is rejected. This shows that the brain gym game is effective in optimizing students' right and left brain.

TABLE 1: The Result *pre-test* dan *post-test*

Respondents	<i>Pre-Test</i>	<i>Post-Test</i>	Gain (d) (<i>Post-Test</i> <i>Pre-Test</i>)	Gain (d) (<i>Post-Test</i> <i>Pre-Test</i>) ²
1	55	56	1	1
2	50	54	4	16
3	48	49	1	1
4	51	55	4	16
5	49	51	2	4
6	50	49	1	1
7	47	49	2	4
8	52	56	4	16
9	53	54	1	1
10	49	52	3	9
11	46	54	8	64
12	46	51	5	25
13	49	51	2	4
14	54	55	1	1
15	53	55	2	4
16	50	52	2	4
17	50	53	3	9
18	55	61	7	49
19	60	61	1	1
20	56	59	3	9
21	52	56	4	16
22	49	52	3	9
23	55	54	1	1
24	44	48	4	16
25	46	51	5	25
26	45	51	6	36
27	47	54	7	49
28	56	57	1	1
29	47	53	6	36
30	53	57	4	16
31	57	59	2	4
32	58	57	1	1
33	56	59	3	9
34	57	55	2	4
35	51	59	8	64
36	45	52	7	49
37	44	50	6	36
38	48	54	6	36

Respondents	Pre-Test	Post-Test	Gain (d) (Post-Test Pre-Test)	Gain (d) (Post-Test Pre-Test) ²
39	48	53	5	25
40	49	55	6	36
41	59	59	0	0
42	57	53	4	16
43	55	56	1	1
44	57	58	1	1
45	45	56	11	121
46	47	52	5	25
47	50	54	4	16
48	50	50	0	0
49	48	54	6	36
50	49	53	4	16
51	47	54	7	49
52	52	57	5	25
53	57	55	2	4
Total Σ	2703	2874	194	1018

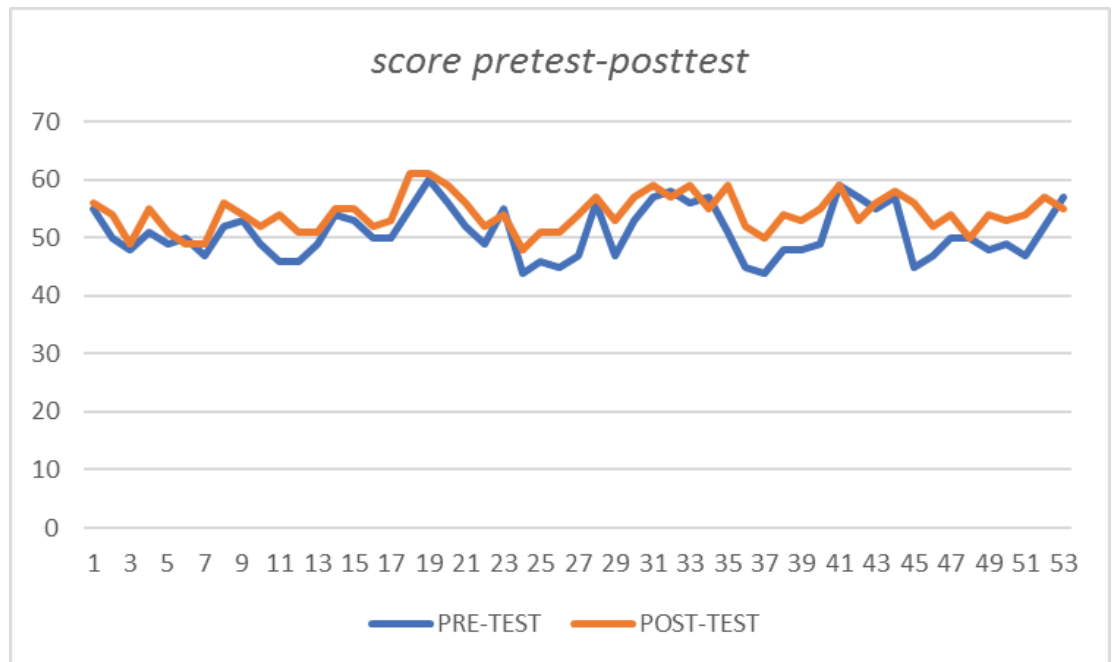


Figure 1: Score pretest-posttest

The results showed that brain exercise was considered effective in reducing saturation levels, [31]. Brain exercise is also believed to improve brain balance [32]. Brain exercise can increase comfort, [33]. Brain gym games are interesting and easy to learn and operate [34]. Brain Gym can help anyone who wants to improve their learning process, [35]. Thus, H_a is accepted and H_o is rejected. This shows that the provision

of guidance and counseling services by guidance and counseling teachers in the form of a brain gym game is effective in optimizing the right brain and left brain of class XI MIPA students in senior high school number 18 Palembang accepted.

5. Conclusion

Based on the results of the research that has been carried out and the discussion of the research results with the aim of knowing the effectiveness of the brain gym game in optimizing the right brain and left brain of students at 18 Palembang Senior High School which consists of classes XI IPA 1, XI IPA 2, XI IPA 3, XI IPA 4 in a sample of 53 students who optimized the left brain without optimizing the right brain, it can be concluded that the brain gym game is effective in optimizing students' right and left brain. Based on the results of the t_{count} above, it is then compared with the t_{table} value. To get the value of t_{table} with $dk = n-1$ or $dk = 53-1 = 52$, if the error is set to 5%, then we get $t_{table} = 1,68$. Based on the value of t_{count} above, it is obtained at 10,90 while the t_{table} is 1,68 or in other words, $t_{count} > t_{table} = 10,90 > 1,68$. Thus, H_a is accepted and H_o is rejected. The brain gym game contributes as a new media for guidance and counseling to reflect the functions of the right brain and left brain, people who succeed in optimizing the ability of the right brain and left brain, their intelligence will be perfect, logical, and social intelligence.

Suggestion

Based on the conclusions of the research, the researchers provide suggestions for teachers, it is hoped that the teachers of Senior high school number 18 in Palembang will motivate students to learn more by playing a brain gym game in optimizing the right and left brain students. Parents/guardians of students are expected to always pay attention to the development of the child's right and left brain functions. If the right brain and left brain are balanced, of course, there will be individuals who are not only successful in academics but also in the social field, meaning that individuals who succeed in optimizing the ability of the right brain and left brain will have perfect intelligence, logic and social intelligence. The principal of the school should give direction to the teacher, especially for guidance and counseling teachers to be able to streamline the implementation of the brain gym game. Students should be able to apply the brain gym game that has been obtained in their daily activities both at home and at school to stimulate or train the development of the right and left brain.

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