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Enhancing Indonesian EFL students' learning outcomes by implementing brain gym

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ABSTRACT The extracurricular activities and self-development after learning activities required extra energy from the students. Therefore, the students' learning outcomes were not maximally achieved. Therefore, the purpose of this study was to enhance the students' learning outcomes of learning English before and after the application of the integration of the scientific approach with brain gym activity. This research was an experimental research design with one group pretest-posttest design. The population of this study was students of class XI SMA Negeri 4 Luwu Utara, Indonesia. The sample of this research was 32 students of class XI 1 Department of Social Studies. However, the final sample amounted to 28 people who met the requirements. Collecting data used was learning outcomes tests. The data were analyzed by using SPSS Application. The results showed that teaching the English language by implementing brain gym activity could enhance the EFL students learning outcomes.

1. INTRODUCTION

The teaching process by the teacher and the learning process by students are two things that cannot be separated. However, teaching by teachers has a more important role in student learning. Good or bad teacher competence in teaching has a parallel impact on student learning processes and outcomes. Therefore, the teaching carried out by the teacher must be based on the needs and interests of students. In line with this, teaching the English language and literature must be able to position itself as a field of study that has a distinctive teaching style oriented to student needs and puts forward innovative, creative, and efficient principles. Thus, the objectives of learning the English language and literature can be achieved.

Learning is a work process of the body and brain. As in learning English, understanding concepts or subject matter is a thinking activity carried out by the brain. Reading, writing, speaking, and listening are also brainwork processes that involve the performance of the human body. Therefore, learning requires sufficient energy to optimize the performance of the human brain and body. If students learn in a weak state, there will be feelings of laziness, drowsiness, loss of concentration, and weak comprehension of students towards the material being learned. The worst thing that will happen is the expected learning goals that will never be achieved.

At SMA Negeri 4 Luwu Utara, the average duration of learning in the class was seven hours a day, starting at 07.00 WITA up to 14.00 WITA with several subjects. Plus extracurricular activities and self-development after learning activities, starting at 15.00 WITA to 16.30 WITA such as English camp, sports, arts, tutoring for Olympic preparation, and several other activities. Then, at home students are still treated to learning activities and doing assignments given at school as well as assignments in their social environment. That is the cycle of activities that students have to go through every day (except holidays). The whole series of activities would require extra energy. However, it was not uncommon for students to be tired, bored, or even sick. Other problems that cannot be ignored were (1) low intellectual abilities of students, (2) emotional disorders (3) students were not mature enough to learn, (4) unsupportive social backgrounds, (5) poor learning habits, (6) low memory capacity, (7) impaired sensory organs, (7) the possibility of inappropriate teaching and learning processes, and (8) lack of support from the learning environment such as the availability of adequate facilities and infrastructure. This was a fundamental problem and a solution must be sought. Therefore, what can be taken to overcome these problems was to position the role of the teacher to design and develop teaching and learning that was acceptable, fun, interesting, comfortable, supports the achievement of student learning goals, and was able to optimize the performance of the student's brain and body at the time. Learning refers to the principles of innovation, creativity, and efficiency.

The integration of the scientific approach with brain gym is one of the English language learning strategies designed to optimize the learning process and the performance of students' bodies and brains. The scientific approach (scientific approach) is a way to teach students scientifically. This approach does not teach students an imaginative, practical, and centered learning process, but there

was a scientific procedure that must be followed to find an accurate conclusion or result in understanding a concept or material. Through this approach, students would seek, find, and produce a fact or finding from a given problem. The scientific approach (scientific approach) also provides an understanding to students that the source of knowledge is not only from the teacher but can be found anywhere and anytime (Kemdikbud, 2013). Meanwhile, brain gym is a series of bodywork activities that aim to optimize brain function and performance. With brain gym, students could learn without stress, able to increase self-confidence, show results immediately, did not require special materials or places, make someone independent in terms of learning, and activate all the potential and skills of students. Brain gym is recognized by the National Learning Foundation USA as the best learning technique (Dennison et al., 2008). Therefore, the integration of brain gym into the scientific approach was an effort to optimize the performance of students' brains in learning simultaneously so that the long and tiring learning process became easy to pass because of the brain and body functions of students.

Learning outcomes can be optimized through the application of activities, procedures, strategies, or learning approaches. It has been used at all schools in Ireland since the early 2000s and its use has become the subject of much dialogue (NCCA, 2019). Things that are important in learning, both results that can be measured directly with graphs and values or learning outcomes that can be observed in their implementation in everyday life (Fauziah & Setiawan, 2009). They added that good learning outcomes can be influenced by the form of learning taught by the teacher. Furthermore, learning outcomes are also obtained from an integral evaluation of learning arrangements in a total way (Ananda, 2019). This is because a good evaluation rubric provides a profile of students' language progress (Latifa et al., 2015).

Many students find themselves in learning difficulties. This difficulty is often found when teaching and learning take place, as a result, language learning outcomes are low (Putra & Taufik, 2019). Therefore, the goal or object of the assessment of learning outcomes is a change of attitude that includes cognitive, affective, and psychomotor aspects in a proportional way (Ananda, 2019). This is in line with Nur & Syarifuddin (2018) who reported that there are at least 3 strategies to be achieved in learning, namely metacognitive, cognitive, and socio-affective strategies. Learning difficulties experienced by students can be reduced by including them in active learning. When teachers can communicate learning modules well, and students can interpret and master what is explained by the teacher, it is called active learning (Nurhayati & Saenab, 2018).

Learning outcomes are intervened by 2 aspects, namely internal aspects and external aspects. The internal aspect that affects the results of practice is how the level of attention of students in learning (Arozaq et al., 2017). Consists of a description of the design (view of insight), the skill of the way (view of expertise), and students' actions (view of action) (Rahmi et al., 2018). Not only that, one of the external aspects is a learning activity. On the contrary, extrinsic encouragement tends to be temporary, because it proves the level of success achieved by students after exploring a learning activity (Sugiyanto et al, 2020). Thus, Singh S and Mahajan M(2017) suggested that learning outcomes must be based on several aspects: (1) insight into the subject; (2) Cognitive – Intellectual skills, must include how to put insight into action, must include solution skills problems; (3) commonly used words, namely defining, explaining, recognizing and others; (4) Efficient – How to conceptualize and carry out research? The words commonly used are demonstrating, applying and others; and (5) general skills – general skills include problem-solving methods, learning keys. Furthermore, he emphasized that compulsory learning outcomes are specific and measurable. Bloom's Taxonomy described the upgrading method and therefore has been proven to be a powerful tool to help improve learning outcomes namely (1) before mastering the design, remembering it well (2) understanding it before implementing it (3) analyzing the current method before assessing it.

Brain gym activities are activities used in learning so that students are more active and participate in class. It is a universally promoted and implemented program with the ability to influence the learning of thousands of children around the world (Watson & Kelso, 2014). Therefore, Watson A and Kelso L(2014) think that brain exercise will be very meaningful for assessing children with neurological-based disorders such as autism. Mendrofa et al. (2020) reported that brain exercise as cognitive training and physical guidance stimulates the brain by releasing mental stress, increasing focus on practice, clearing the mind, increasing memory and cognitive skills such as accuracy, focus, and dexterity in how to train yourself. Furthermore, they added that brain exercise stimulates the functioning of the brain to be more efficient in the elderly, and facilitates the circulation of blood and oxygen to the brain. Furthermore, Apandi (2019) stated that brain exercise activities are an effort to make students feel more peaceful, the body becomes fresher which will bring transformation to students. For Yusuf et al. (2010), brain exercise itself aims to maintain the balance of power between the right brain and left brain remains optimal. They also suggested that brain exercise provides a repair boost to the fibers in the corpus callosum that provide many of the two-way neural connections between the cortical zones of two parts of the brain, including the hippocampus and amygdala.

According to the originator of brain exercise, Dennison, the basis of brain exercise is the interdependence between action, cognitive, and learning techniques. Some previous research has found that the application of brain exercise has a positive effect on academic ability, focus, and balancing the abilities of students (Mendrofa et al., 2020; Apandi, 2019; Yusuf et al., 2010). Thus, this activity helps students to develop and strengthen fair routes that allow them to make connections between what they already know in the back of the brain and the ability to express and work on that data in the front part of the brain (Dennison et al., 2008). Therefore, to be successful in learning activities, teachers must relate to their students (Apandi, 2019). He also added that in receiving data, the hindbrain is difficult to express, as a result, people feel stress which causes their enthusiasm to practice and work to decrease.

2. METHOD

The type of research used was experimental research. This was chosen because the researcher provided treatment to the sample to determine the effect of the treatment. The application of an integrated scientific approach to brain exercise would be seen in learning outcomes of learning English in class XI students of SMA Negeri 4 Luwu Utara. This

experimental research used a one-group pretest-posttest design (Sugiyono, 2013: 110). This design used only one class to be given treatment. This design was applied by measuring the students' English language learning ability before the treatment was given (pre-test). After the initial measurement, the next step was to provide treatment. The treatment, in this case, was the application of an integrated scientific approach to brain exercise in English language learning. After the treatment was given, the measurement of the final condition after treatment (post-test) was carried out. The results of the two tests were then used to determine the students' learning outcomes.

The sample in this study was selected by using cluster sampling. Based on preliminary research data, the lowest English learning outcomes were students majoring in social studies, totaling four classes. The four classes would be randomly selected to serve as the experimental class or sample class. Based on this view, it was found that the sample in class XI IPS1 was 32 students, namely, 6 students were male and 26 other students were female. The hypothesis testing used was the paired sample T-test. This hypothesis testing aims to determine whether or not there are differences in student learning outcomes before and after the integrated scientific approach to brain exercise was given. The significance level was 0.05. If the significance value was greater than the probability value, then the alternative hypothesis was accepted and the null hypothesis was rejected and could be generalized.

3. RESULT & DISCUSSION

3.1 Descriptions of Students' Learning Outcomes to Learn English Language Before Treatment (Pretest)

Learning outcomes data were collected using tests. The type of test used was multiple choices totaling 25 items. The test was used to measure student learning outcomes before and after treatment. The initial and final ability test instruments used were identical. That was, the items were developed from the same indicators. Test scores were given based on the number of correct answers. This means that if the student answers each item correctly, the score obtained was 25, but if the student answers incorrectly then the score was 0 (zero). The students' learning outcomes before treatment (post-test) were as follows table 1:

Based on the table above, it is known that the final score of the student before the treatment is given, namely, the highest score was 68 and the lowest score was 20. These values are further categorized into the following table 2:

Based on the table above, it was known that student learning outcomes were not optimal. The average student's ability was still very low. Only two students had good test results. Meanwhile, nine students had quite good test results, 15 students had poor test results, and two other students had very poor results. This proves that students have not been able to remember well the material that has been taught.

3.2 Descriptions of Students' Learning Outcomes to Learn the English Language After Treatment (Posttest)

After knowing that the students learning outcomes to learn English were low, then they were given treatment in the form of an integrated scientific approach to brain exercise.

TABLE 1. The student' learning outcomes before treatment (pretest) and after treatment (posttest)

		Pretest		Posttest	
No	Samples	Score	Final Score	Score	Final Score
1	XI IPS1 A	7	28	18	72
2	XI IPS1 B	11	44	23	92
3	XI IPS1 C	6	24	16	64
4	XI IPS1 D	9	36	20	80
5	XI IPS1 E	5	20	15	60
6	XI IPS1 F	14	56	22	88
7	XI IPS1 G	8	32	19	76
8	XI IPS1 H	12	48	18	72
9	XI IPS1 I	16	64	25	100
10	XI IPS1 J	11	44	19	76
11	XI IPS1 K	7	28	15	60
12	XI IPS1 L	9	36	16	64
13	XI IPS1 M	10	40	17	68
14	XI IPS1 N	8	32	11	44
15	XI IPS1 O	11	44	17	68
16	XI IPS1 P	11	44	19	76
17	XI IPS1 Q	6	24	15	60
18	XI IPS1 R	17	68	23	92
19	XI IPS1 S	6	24	11	44
20	XI IPS1 T	8	32	15	60
21	XI IPS1 U	7	28	13	52
22	XI IPS1 V	11	44	21	84
23	XI IPS1 W	14	56	20	80
24	XI IPS1 X	5	20	12	48
25	XI IPS1 Y	9	36	17	68
26	XI IPS1 Z	6	24	14	56
27	XI IPS1 AA	8	32	14	56
28	XI IPS1 BB	11	44	18	72

TABLE 2. Frequency distribution of students' learning outcomes before treatment

Value Range	Categories	Frequency
86-100	Very good	0
66-85	Good	2
46-65	Prety good	9
26-45	Not good	15
0-25	Not very good	2
	Total	28

This treatment aims to determine the influence on student learning outcomes. The treatment was given for four meetings. Then, the measurement of English learning outcomes after the treatment was carried out. The results were as follows Table 1

Based on the table above, it is known that the final score of students after treatment was given, namely the highest

TABLE 3. Frequency distribution of students' learning outcomes before treatment

Value Range	Categories	Frequency
86-100	Very good	4
66-85	Good	12
46-65	Prety good	7
26-45	Not good	2
0-25	Not very good	0

TABLE 4. Paired Samples Test from Control Class

	Mean	N	Std. Deviation	Std. Error Mean
Before	37.57	28	12.80	2.41
After	69.00	28	14.55	2.74

score was 100 and the lowest score was 44. These values were further categorized into the following Table 3. Based on the Table, it is known that student learning outcomes after treatment have increased. Four students got very good learning outcomes, 12 students got good categories, seven students got enough categories, and two students got poor categories. None of the students was netted in the very bad category.

3.3 Hypothesis Testing

The paired sample statistics table above shows a summary of statistics, it could be seen that the English students' learning outcomes before treatment were 37.57 and the average English students' learning outcomes after treatment was 69.00, experiencing an increase in the average English students' learning outcomes to 31.42, the standard deviation refers to the variation of data on each variable, the standard deviation of student learning outcomes before treatment was 12.80 and after treatment was 14.55, N indicates the amount of data was 28.

The data shows that the significance value (0.00) is lower than the probability value (0.05). It means that H0 was rejected and H1 was accepted. It indicates that there was a significant improvement in students learning outcomes after integrating the scientific approach to brain exercise.

In learning activities, brain exercise has a very important role to restore the power or ability of the brain to work if people experience boredom or fatigue at work. Thus, the function of brain exercise is to strengthen human memory, both short and long-term memory, which is needed by students in mastering a stack of subject matter given. Dennison et al. (2008) stated that the Brain gym lengthening activities help students to develop and reinforce those neural pathways that enable them to make connections between what they already know in the back of the brain and the ability to express and process that information in the front of the brain. In line with it, Kartina (2009) in her research proved that doing brain exercise before studying has a very positive impact on student achievement. Brain exercise is also recognized by the National Learning Foundation USA as the best learning technique (Dennison et al., 2008).

Before the treatment was given, the average student learning outcomes were still very low. Only two students had good test results. Meanwhile, nine students had quite good test results, 15 students had poor test results, and two other students had very poor results. However, after being given the treatment, there was a difference improvement in student learning outcomes, namely four students with very good category learning outcomes, 12 students in good categories, seven students in enough categories, two students with poor categories, and no more students who were netted with very bad category.

Even though the resulting benefits were so good, the integration of a scientific approach with brain art certainly has a weak side or obstacles faced during its application in learning, especially in English. The scientific approach and brain exercise are two different concepts. Merging the two into one new concept is something that is not easy. There were several obstacles during the implementation process namely: (1) in its application, the integration of the scientific approach with brain exercise required a lot of time, so it was not very effective if it was applied in learning with a relatively short duration of time without taking advantage of the environment outside of learning activities; (2) some movements were complicated to apply during learning activities because they required special preparation such as a mat. This equipment was provided because students have to lie down and sit directly on the floor; (3) teachers must be good at maintaining the atmosphere of the class because brain exercise movements were often used as material for students' jokes; (4) the teacher must be able to maintain students' attention to the subject matter when students were directed to carry out brain exercise movements that were inserted in several parts of the student learning stages. Because it was very prone for students to turn their attention when learning activities were shifted to brain exercise activities. Weaknesses were found at the trial stage and early-stage learning activities. Furthermore, these weaknesses were reflected again and evaluated so that it does not occur again in the next learning activity.

3.4 Discussion

The conclusion that can be drawn based on the results of the research and discussion was teaching the English language by implementing brain gym can enhance the EFL students learning outcomes. The enhancement was gotten because the systematic learning procedures and brain function worked optimally. It certainly made the students easier to master the subject matter given. The material was

TABLE 5. Paired Samples Test from Control Class

				95% CI				
	Mean	Std Deviation	Std ErrorMean	Lower	Upper	t	df	Sig.
Posttest-Pretest	−3 14	8 41	1 58	−34 69	−28 16	-19.76	27	.000

easily learned by students because the process of recording or remembering and living the learning runs in a balanced manner. Students would be active in learning and not experience stress because of the large learning load. However, it could not be denied that the application of an integrated scientific approach to brain exercise required skill and work persistence from a teacher to be able to carry out learning procedures correctly. Teaching students maximally to achieve maximum results was certainly not an easy thing. It took hard work from a teacher to be able to determine the roots of the problems faced by students and teachers.

4. CONCLUSION

The conclusion that can be drawn based on the results of the research and discussion was teaching the English language by implementing brain gym can enhance the EFL students learning outcomes. The enhancement was gotten because the systematic learning procedures and brain function worked optimally. It certainly made the students easier to master the subject matter given. The material was easily learned by students because the process of recording or remembering and living the learning runs in a balanced manner. Students would be active in learning and not experience stress because of the large learning load. However, it could not be denied that the application of an integrated scientific approach to brain exercise required skill and work persistence from a teacher to be able to carry out learning procedures correctly. Teaching students maximally to achieve maximum results was certainly not an easy thing. It took hard work from a teacher to be able to determine the roots of the problems faced by students and teachers.

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