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BRAIN BASED LEARNING APPROACH ON LEARNING PROCESS REACTION RATE MATTER IN SMAN 1 KEBOMAS GRESIK

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Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui aktivitas siswa dalam kelompok dengan penerapan *brain based learning*, dan untuk mengetahui peningkatan hasil belajar siswa setelah menggunakan pendekatan tersebut. Penelitian ini merupakan jenis penelitian *experimental design, one group pretest posttes*, yang dilaksanakan di SMA Negeri 1 Kebomas Gresik, kelas XI IPA 3. Penelitian ini dilaksanakan selama 3 kali pertemuan dengan waktu 2x45 menit untuk tiap-tiap pertemuan. Disimpulkan aktivitas siswa dalam kelompok yang paling dominan adalah praktikum yang sesuai dengan *learning principle 1* dan diskusi yang sesuai dengan strategi *social brain* dan *learning principle 2*. Aktivitas yang tidak relevan menunjukkan persentase yang sedikit dan tidak mengganggu proses pembelajaran. Terjadi peningkatan hasil belajar siswa dengan diterapkannya pendekatan tersebut, dengan persentase 0% siswa tuntas pada pretes dan untuk posttes menunjukkan sebesar 84,37% siswa tuntas.
Kata kunci: *brain based learning*, laju reaksi, aktivitas siswa, hasil belajar.

Abstract

The aim of this study is to know the activity of students in their group with brain based learning implementation and to know the increasing of learning outcomes after using that approach. This experimental study, which was designed as praexperimental design, one group pretest posttest, was conducted in SMAN 1 Kebomas Gresik class XI science 3. The study lasted 3 meeting with every meeting consist of 2x45 minutes hours. It was concluded that activity of student mostly spend in doing experiment corresponding to learning principle 1 and discussing which corresponding to social brain strategy and learning principle 2. The irrelevant activities are present in a little percentage and have no influence mainly to the learning process. The learning outcomes was increase from 0% in pretest become 84.37% student past the posttest with brain based learning implementation.
Keyword: brain based learning, reaction rate, student's activity, learning outcomes.

INTRODUCTION

Student can learn optimal in conducive situation where the brain is placed in the best moment to learn. According to Hileman (2006), Learning is innately linked to the biological and chemical forces that control the human brain[1]. Brain-Based learning is a instructional approach which integrate some of simple inventions to increase learning process, enrichment, and reorganization cognitive system.

This learning approach pushes the teacher to think naturalistic of brain development to make decision. By using their knowledge about the brain, teacher can make better decision to create a condition where student can select the best way to develop their ability. There are a lot of teacher didn't know that they have been block student's brain ability by intralinear and predictable teaching[2]. The result is a bored learning process or make students frustrated and continuing stuck on undeveloped cycle.

Brain based learning is an approach that can facilitate a learning process become attractive, not only treat students to think

optimal with their brain but also help them to be an active students in each of learning activity. This approach create a learning process with the brain potential development orientation to increase learning outcomes.

Chemistry matter, rate of reaction, factors affect reaction rate (concentration, surface area, temperature, and catalyst) are compatible to brain based learning approach. That matter could be said suitable to brain based learning approach because it is include in the first learning principle of brain based learning, where student have to find their own concept. It can be used as a memory code method corresponding to one of brain based learning stage that is incubation and memory coding. The other stage that suitable to that matter is preparation. In this stage, teacher give a phenomenon of reaction rate in daily life.

Based on interview with teacher and students questionnaire on January 23th 2013 in SMAN 1 Kebomas Gresik, there was no an approach that could facilitate students to find their potential. From learning outcomes data, there was 50% students not pass reaction rate matter with minimum of score is 75, that's why it is need to apply an approach that could increase the learning outcomes. There are 26.67% students think that rate of reaction matter is difficult to understand because it is include a lot of concept and there is no fun approach to fix this, although there are 16.67% of students interest to chemistry.

That's why it is need to do a research that have objectives to know the activity of students and learning outcomes using brain based learning approach. By using that approach, there is students activity which support brain based development and irrelevant activity show a little percentage, then there is increasing of learning outcomes.

METHOD

This experimental study, which was designed as praexperimental design, one group pretest posttest, was conducted in SMAN 1 Kebomas Gresik class XI science 3. The participants of this research are 32 students that distribute to 8 groups. This research need 4 observer to know how is the activity of students during research process using brain based learning approach including its stages, strategies, and principle.

There are seven stages in brain based learning approach, those are Pra-explanation, preparation, initiation and acquisition, elaboration, incubation and memory coding, verification and belief checking, celebration and integration[2].

According to Hileman there are 10 teaching strategies that could be used in brain based learning implementation, but the researcher just choose 8 strategies those are brain's time clock, repetition, active learning, novelty, automatic learning, social brain, elicit emotions, and developing thinking skills[1].

The principle of brain based learning provide a theoretical framework for the effective learning and teaching process by practicing real life experiences (Ozden and Gultekin, 2008)[3]. The researcher use 5 from 12 principles according to Caine (2000)[4], as follow:

- Principle 1: All students have the capacity to comprehend more effectively when involved in experiences that naturally call on the use of their senses and their bodies.
- Principle 2: All students have the capacity to comprehend more effectively when their needs for social interactions and relationship are engaged and honored.
- Principle 8: All students can comprehend more effectively when given time to reflect on and process those experiences about which they live and read.

- Principle 9: All students can comprehend more effectively when immersed in experiences that engage multiple ways to remember.
- Principle 11: All students can comprehend more effectively in a supportive, empowering, and intrinsically challenging environment.

The study lasted 3 meeting with every meeting consist of 2x45 minutes hours. There was pretest before the research process, then the group was administered a brain based learning approach and the observer observed all of their activity corresponding to group activity observation sheet. And there was posttest after it.

RESULT AND DISCUSSION

After the experimentation process, the data obtained through activity of students in group and test were analyzed in order to investigate the activity of students in their group with brain based learning implementation and to know the learning outcomes using that approach.

Table 1. Observation Result of Student's Activity in Their Group on Meeting 1, 2, and 3 using Brain Based Learning Approach

No	Activity observed	% activity on meeting		
		1	2	3
1	Answering teacher/student's question (LP 9).	11,11	11,11	11,11
2	Listening to teacher explanation (Brain's Time Clock).	5,55	5,55	5,55
3	Giving opinion to the phenomenon in worksheet (LP 8).	5,55	5,55	5,55
4	Moving the chair before doing the experiment (Novelty), listening instrument music (Novelty), and doing experiment (LP 1).	16,67	16,67	11,11
5	Discussing with others (Social Brain dan LP 2).	16,67	11,11	16,67
6	Presenting the result in front of class (Elicit Emotions dan Developing Thinking Skills).	5,55	5,55	5,55
7	Watching video (Images dan Repetition).	0	5,55	5,55
8	Doing relaxation (Active Learning).	0	5,55	5,55
9	Playing the game (LP 11).	11,11	11,11	11,11
10	Asking to the teacher.	5,55	5,55	5,55
11	Concluding the learning material.	5,55	5,55	5,55
12	Doing unrelevant activity (playing mobile phone, talking out of topic, etc)	5,55	0	0
13	Listening others opinion	5,55	5,55	5,55
14	Celebrating the end of learning process	5,55	5,55	5,55
Total		**100**	**100**	**100**

LP = Learning Principle

Could be seen in Table 1 that generally the activities of student in their group mostly spend in activity 4 and 5. Activity 4 is doing the experiment (LP 1) with escorted by instrument music (Novelty) have percentage 16.67%. This fact is corresponding to constructivism theory that student need to find their own concept, whereas playing instrument music is used to make student feel enjoy according to novelty strategy, brain enjoys new or contrasting experiences[5].

Figure 1. Students doing the experiment escorted by instrument music.

Activity 5 is discussing, 16.67%. Student need discuss the experiment result to compare their idea to others. And determine which one is correct or not. This is good for their social brain development and also good for them to develop their prior kowledge. Corresponding to Hileman strategy the social nature of the brain lends support to the notion that working cooperatively enhances learning. Effective cooperative learning includes: (1) face-to-face interactions, (2) positive interdependence, (3) group and individual accountability, (4) small-group decision making skills, and (5) meta-processing skills (Hileman, 2006) [1]. That is match to learning principle 2 from Caine (2000), all students have the capacity to comprehend more effectively when their needs for social interactions and relationship are engaged and honored[4].

Figure 2. Students discuss the experiment result in their group.

Student activity to watching video and relaxation are 0% in meeting 1, it's mean that activity isn't carried out. It is because the time management is low, the student late about 15 minutes. By the decreasing of time the researcher get difficulty to think more about the time table and organize the next activity. But the researcher did better in the next meeting, so this mistake isn't occur.

Generally, the irrelevant activity of student is 5.55% in meeting 1 and decrease to 0% in meeting 2 and 3. The irrelevant activity such as joking, talk out of topic, etc may happen because teacher make the learning process become enjoy, and make the student learn without anxiety or pressure. This has a little effect to make them feel free to express their feeling but all of them is under control and not disturb learning process.

This following figure shown data of student learning outcomes before and after brain based learning implementation. The data is taken by giving some of question about reaction rate to investigate the increasing of learning outcomes after student administered by brain based learning approach.

The learning outcomes could be seen in Figure 3. After brain based learning implementation there is increasing learning outcomes. It is shown that 0% student passes the pretest and 84.37% student was pass from posttest with minimum criteria of thoroughness is 75. Compared by interview data to the teacher in SMAN 1 Kebomas Gresik there was 50% not pass in reaction rate matter using another approach.

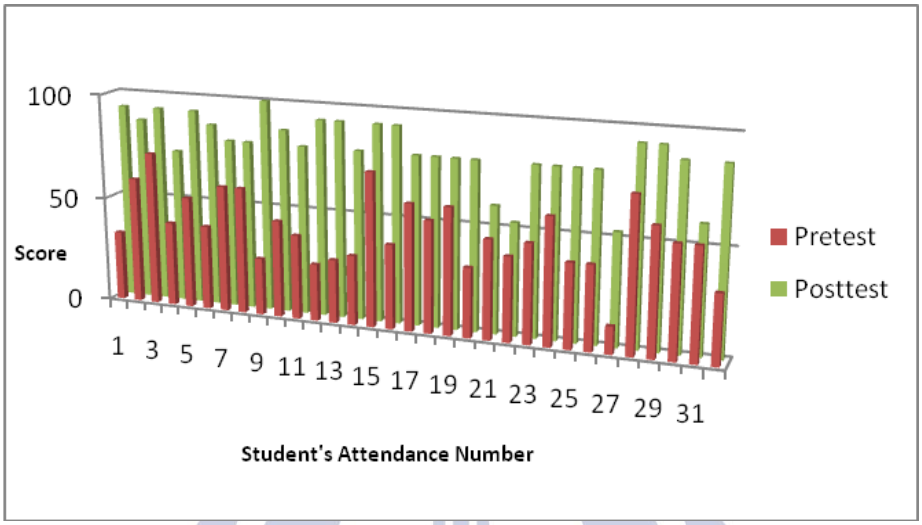

Figure 3. Diagram of learning process result before and after brain based learning implementation

CONCLUSION

Based on the result of research and data analysis, could be said that the implementation of brain based learning approach is well done, because the activity of students in their group already show the activity of brain based learning and the result of learning process was increase after brain based learning implementation.

The dominant activities are doing experiment and discussion. Student's behavior that shows irrelevant activity is decrease from meeting 1 is 5.55% become 0% in meeting 2 and 3. Classically, 0% of students were passed the pretest and after brain based learning implementation, 84.37% students were pass the posttest with minimal criteria of thoroughness is 75.

SUGGESTION

Based on discussion and conclusion above, generally the aims of this research already achieve. But there are some suggestions for the next research as follow:

1. For the next research the researcher can combine brain based learning approach and critical thinking because both of them push the students to find and process the information to mastery learning and deep understanding the matter.
2. It is important to concern with time management in using this approach because there are many of strategies and principles that need to do**.**

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