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THE INFLUENCE OF STUDENT FACILITATOR LEARNING MODEL AND EXPLAINING USING MIND MAPPING ON THE RESULTS OF LEARNING NATURAL SCIENCE

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A B S T R A C T

The aim of this research to know about: 1) the effectiveness of implementation of learning SFAE with Mind Mapping for IPS at V grade in Gugus VI Kintamani. 2) The difference of the result in IPA between students who followed learning conventional for V grade Gugus V Kintamani. The type of this research is quasi experiment with non-equivalent posttest only, control group design. The sample in this research is all of the students in V grade SDN langgahan with total 20 students and student in V grade SDN Awan is 22 student from the total students is 109 students. Random sampling technique used to determine experiment class and control. The method of data collection is used statistics descriptive, test-t , and ANAVA –the result shows about: 1) There is the effective influence implementation about SFAE learning with Mind Mapping of the result of learning IPA V grade gugus VI kintamani district with the high effectiveness with result of ES = 2,93 and 2) for the difference to the result of the IPA between students with following learning with using SFAE learning of Mind Mapping and the student followed conventional learning with the significant assessment (28,42>4,08) ,therefore in the conclusion learning of SFAE models with Mind Mapping has the influence for the result of study IPA for student in V Grade in Kintamani district.

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1. Introduction

The learning process at each level of education is an implementation to achieve educational goals in Indonesia. In Law No. 20 of 2003, Chapter II Article 3 is concerned "National education aims to develop the dignified character and character of the nation's civilization in the context of intellectual life of the nation, and develop the potential of students to become human beings who believe in and have faith in God Almighty, have noble, healthy , knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible ". national education also aims to assist humans in developing their potential so that they are able to deal with any changes that will occur.

To achieve the goal of national education can be achieved through formal, informal and non-formal education. Especially formal education, namely, education held in schools in general, which gets several subjects as set in Law No. 20 of 2003 concerning the National Education System, Article 37 Paragraph 1 which states, that the curriculum at the level of primary and secondary education must contain 10 subjects. One of them is the subject of Natural Sciences. Based on Permendiknas No. 22 of 2006 states that "science is related to how to find out about nature systematically, so that science is not only mastering a collection of knowledge in the form of facts, concepts, or principles only but it is also a process of discovery ". In line with Trianto's opinion (2013: 136) states "Science is a collection of systematic theories, which learn about natural phenomena through scientific methods such as observation and experiment". Science learning in elementary schools is expected to be a vehicle for students to learn about themselves and the natural environment, and be able to develop further in applying it in everyday life.

The purpose of learning science in elementary schools in the national body of education standards (BNSP, 2006) one of which is the development of a positive attitude of curiosity and awareness of the existence of interrelated relationships between science, the environment and society.

To achieve these objectives, science learning must be in accordance with the characteristics of students who are still in the concrete operational stage, who have not been able to think abstractly and have diverse characteristics such as: like to play, like to imitate, work in groups, and always want to implement or feel Piaget themselves (in Susanto, 2013). Therefore, learning science in elementary schools should be designed to suit the needs of students in accordance with the characteristics of elementary school students. So that it can improve student learning outcomes in science lessons, but the reality is still not achieving the expected learning outcomes.

Based on the results of interviews conducted on November 26, 2017 with natural science teachers in class V at SDN Cluster VI Kintamani, the interview results obtained are (1) the majority of class V students who participate in learning are still less active and play a passive role. (2) students when attending class in learning tend to be bored and unpleasant. (3) the lack of learning media provided by the school. (4) learning outcomes obtained by students tend to be low.

Followed by observations to teachers who are carrying out science learning in class, get results, namely: (1) class learning more often uses the lecture method. (2) when learning takes place teachers rarely use instructional media so that students get bored quickly. (3) teachers rarely involve students when learning takes place which results in poor learning outcomes. One that can be used to overcome the above problems needs to be applied to various types of approaches, strategies and learning models. The learning model that can be used to overcome the above problems is the Student Facilitator And Explaining learning model, this learning model is a model that trains students to play an active role such as expressing opinions, explaining the concepts of learning material and the questions they have to friends involved in learning process, so that in the learning process all students can be involved directly and actively in following learning. In line with the opinion of Kurniasih & Sani (2015: 79). Stating that the Student Facilitator And Explaining learning model is a learning model that trains students to be able to present their ideas or ideas to their peers.

This learning model will be better if it is integrated with Mind Mapping. Mind Mapping aims to increase student creativity in taking notes and explaining subject matter so that learning becomes fun and not boring. In line with the opinion of Sarya (2015) "Mind Mapping Is a verbal visualization technique into the picture. Mind maps are very useful for understanding material, especially material that is given verbally.

Thus the science learning process by applying the Mind Facing Mapping Facilitator and Explaining (SFAE) model is expected to improve learning outcomes for the better. In line with the findings of Sanjaya (2014) which states that "students who are taught using the SFAE learning model can foster student interaction in learning activities to be active. Interactions that occur are multi-directional interactions, from student to student, student to teacher and vice versa. Besides that students are also more able to exchange opinions objectively in learning and can improve student learning outcomes ". Mind Mapping has many advantages, namely: (1) with Mind Mapping the ideas of the problem are clearly identified (2) Mind Mapping makes it more able to concentrate on the problems that are often encountered. Science learning by using the Mind Mapping model is expected to increase student activity and learning outcomes in science learning can be improved. Thus students not only listen to the teacher explain in front of the class, but student activities are needed in developing the subject matter in the learning process in order to improve student learning activities and outcomes.

Learning outcomes are abilities obtained by children after going through learning activities that include the cognitive, affective, and psychomotor domains. learning is not only the mastery of the concept of subject theory, but also the mastery of habits, perceptions, enjoyment of talent interests, social adjustment, kinds of skills, ideals, activities and expectations, student learning outcomes after receiving his learning experience, after following the learning process in class and outside Susanto's class, (2013: 5).

According to Haetik, et al (2016) states that learning outcomes are something that is achieved by someone after the person is doing learning activities. Learning outcomes are assessed to determine the extent to which certain materials or subject matter can be understood by students.

Natural Sciences (IPA) deals with how to find out about nature systematically, so that science is not only the mastery of knowledge in the form of facts, concepts or principles but also a process of discovery made. According to Agustina & Tika, (2013: 272) IPA is a structural and systematic series that is carried out to find concepts, principles and laws about natural phenomena. According to Susanto, (2013: 167) Natural sciences are human endeavors in understanding the universe through proper observation of targets, using procedures, and explained with reasoning so as to get a conclusion. From the explanation above, it can be concluded that Natural Science (IPA) is a science that studies the events that occur in the

universe, both living things and inanimate objects through concepts, principles, laws and facts that are found with proper observations and procedures so that they get a dream.

The Student Facilitator And Explaining (SFAE) learning model is one type of cooperative learning that emphasizes specific structures designed to influence learners' interaction patterns and aims to increase mastery of Shoimin material, (2014: 184). According to Kurniasih & Sani (2015: 79) states that the Student Facilitator And Explaining learning model is a learning model that trains students to be able to present their ideas to their peers. Meanwhile, according to Aqib, (2013) states that the learning model of Student Facilitator And Explaining is a learning process where students / students present their ideas / opinions to other fellow participants.

Based on the explanation above, it can be concluded that the Student Facilitator And Explaining model is a learning tabular model that gives students the opportunity to explain the subject matter to other students. Mind mapping / mind map is a graphic tectis that allows us to explore all the abilities of our brain for the purposes of thinking and learning. Sleep, (2016: 16). According to Tony and Buzan (2004: 68) Mind maps are expressions of radian thinking because mind maps are a natural function of the human mind. Followed by Sarya (2015) "Mind mapping, a verbal visualization technique into images. Based on the explanation above, it can be concluded that Mapping / mind map is a way to describe and map the contents of the mind into an image or graphic so that it can help record, strengthen, and recall information that has been learned.

Conventional learning can also be referred to as a learning model because it contains syntax, social system, principles of reaction, and support systems. According to Rasana (2009: 20) conventional learning is still widely applied in elementary schools. Submission of material in conventional learning is mostly done through lectures, questions and answers, and assignments that take place continuously.

Considering the problems found above, it is necessary to do research with the aim of 1). To find out the effect effectively in the implementation of learning models of Student Facilitator and Explaining Assisted by Mind Mapping on the learning outcomes of Class V students in Elementary School Cluster VI Kintamani District 2017/2018 . 2) to find out the difference in science learning outcomes between students who take learning with the Student Facilitator and Explaining Assisted Learning Model with Mind Mapping and students who take conventional learning in fifth grade students in Elementary School Group VI, Kintamani Subdistrict, academic year 2017/2018.

2. Methods

This research is a quasi-experimental research (quasi experiment). Because not all variables that arise and the conditions of the experiment can be tightly controlled and controlled. This study uses a post-test only control group design.

The population in this study were all fifth grade students in the even semester at Cluster VI SDN Kintamani District, Bangli Regency in the Academic Year 2017/2018 with a total of 109 students. after determining pepulation, then study the document about the learning outcomes of Class V Natural Sciences in odd semester and proceed with the class equality test using the one-way Anava-a test.

After the equality test was continued with the determination of the sample, by using a random sampling technique of 6 elementary schools which got the result that the fifth grade SDN class had become an experimental class of 20 students and SDN Awan became a control class of 22 students.

The data analyzed in this study were natural science learning achievement tests using an objective test (multiple choice), the tests were tested so that they were tested for validity, reliability, degree of severity and different power. After tested the test is used as a post test.

The method of data analysis in this study uses descriptive statistical analysis methods and Variant analysis (ANAVA). Descriptive analysis is used to describe student learning outcomes. Analysis of variance used in this study is one-way analysis of variance. By calculating the average value, mode, median, scale of five, and the maximum and minimum values in this study the data is presented with gfafik histogram. Before conducting a hypothesis test, several prerequisite tests must be carried out as follows.

1) Test for normality
To test the normality of science learning outcomes, the Chi-Square formula is used with the terms $t_{count} < t_{table}$.

$$\chi^2 = \sum \frac{(f_0 - f_e)^2}{f_e}$$

(Koyan, 2012)

Note:

f_0 = Observation frequency

f_e = Expectation frequency

2) Homogeneity Test

Homogeneity test for regression analysis requirements uses the same technique as homogeneity test for difference test requirements. To test the homogeneity of the variance for the two groups the F test was used with the provisions of $f_{count} < f_{tabel}$.

$$F_{hit} = \frac{Variansterbesar}{Variansterkecil}$$

After conducting the prerequisite test, it is continued with testing the hypothesis, the hypothesis in this study is in accordance with the formulation of the problem that is using 2 analyzes, the first hypothesis analysis using the t test formula and the second hypothesis using the ANAVA-A test one way. The following formula is used to test the hypothesis in this study.

Hypothesis 1 states that there is an effective effect on the implementation of the Student Facilitator and Explaining (SFAE) learning model on the learning outcomes of science students in grade V of SD VI Cluster Kintamani District Hypothesis 1 Testing using the t-test formula as follows.

$$t = \frac{\overline{X} - \mu}{\sqrt{\frac{\sum D^2}{N(N^2 - 1)}}}$$

(Dantes, 2012:63)

Note :
$\overline{X}$ = average of learning outcomes
i = Criteria (KKM)
D = Deviation

Hypothesis 2 states that there are differences in science learning outcomes between students who take the Student Facilitator And Explaining (SFAE) learning model and students who take conventional learning in fifth grade students of Elementary School VI Class Kintamani District 2017/2018. Hypothesis 2 testing in this study uses One Way ANAVA-A.

3. Findings and Discussion

Recapitulation of the calculation of research data about students' science learning outcomes can be seen in Table 1.

Table 1.
Recapitulation of Calculation Results for Science Learning Outcomes Scores

Variation Source	Science Learning Outcomes		
	Experiment Group	Control Group	Total
Mean	81,50	61,54	143,04
Median	82,87	60,19	143,06
Modus	85,12	56,16	141,28
Varians	126,33	138,76	265,09
Standar Deviasi	11,78	11,24	23,02
Skor minimum	53	40	93
Skor maxsimum	97	87	184
Rentangan	45	48	93

Based on Table 1, the post test results in the experimental group obtained a mean of 81.50, a median of 82.87 and a mode of 85.12, it can be seen the value of Mo> Md> M. This means that the value of

the experimental group tends to be very high, followed by the control group to obtain a mean of 61.54, a median of 60.19, mode 56.16, the value of Mo <Md> M. .

After that testing the assumptions that contain pre-test is done by testing the Data Normality. The normality test is carried out to test an empirical distribution following the characteristics of a normal distribution or to investigate the fo (frequency of observation) of the symptom under investigation that does not deviate significantly from the fe (frequency of expectation) in the normal distribution. Data analysis conducted, can be presented a summary of the results of the normality of the test results of the science learning outcomes of the experimental and control group students in Table 2.

Table 2.
Summary of Test Results Normality of Science Learning Outcomes Data Distribution

No	Learning Outcomes Data Group	χ^2_{hutung}	χ^2_{tabel}	Status
1	Experiment	4,289	5,591	Normal
2	Control	2,791	5,591	Normal

After conducting the data normality test, the variance homgenity test is carried out. The homogeneity test is performed on the variance of pairs between the experimental and control groups. The test used is the F-test with homogeneous data criteria if $F_{count} < F_{table}$. A summary of the results of the homogeneity of the variance between the experimental and control groups is presented in Table 3.

Table 3.
Summary of Experiment Group Homogeneity Test Results and the control group

Learning Outcomes Data Group	F_{count}	F_{table}	Status
Experiment Control	1,10	4,08	Homogen

Based on table 3, it is known that the F_{count} for science and learning outcomes of the experimental and control group students is 1.10 while the F_{table} with db numerator = 2-1 = 1, the db mentioner = 42-2 = 40 and the 5% significance level is 4.08 This means that the $F_{count} < F_{table}$ so that the variance data of science learning outcomes of the experimental and control group students is homogeneous. Based on the data analysis prerequisite test, it was found that the data of the science learning outcomes of the experimental and control group students were normal and homogeneous. After obtaining the results of the data analysis prerequisite test, proceed with testing the research hypothesis.

The first hypothesis testing uses the t analysis test by comparing the learning outcomes of science students with KKM that have been set in the eyes of science students. The results of the analysis obtained t = 13.34, after obtaining the results of the t test continued with testing the level of effectiveness that obtained the results of ES = 2.93 which also states that the learning model of Student Facilitator and Assisted Assisted Mind Mapping on the learning outcomes of fifth grade students in Elementary School in the Cluster Elementary School VI Kintamani District Bangli Regency has a high effectiveness.

Based on the second hypothesis test states that "there are differences in science learning outcomes between students who follow the learning model of Student Facilitator and Exolaining (SFAE) with students who take conventional learning in fifth grade students of Elementary School VI Class Kintamani District 2017/2018" testing the hypothesis performed using the ANAVA-A test (one path) with the provisions of the hypothesis H0 rejected if tcount> ttable and H0 accepted if $t_{count} < t_{table}$. The results of ANAVA-A calculations can be presented in table 4.

Table 4.
Summary of Hypothesis Test Results Using ANAVA Test

Sumber variasi	JK	Db	RJK	F_h	F_{tab}(5%)	Results
Between	991,9	1	7688,6	28,42	4,08	Signifikan
Within	553,5	40	270,508	-	-	
Total	1545,4	41	-	-	-	

Based on Table 4, it is known that Fcount is 28.42. Furthermore, the results of these calculations are compared with F_{table} with a numerator db 1 and the denominator db 40. Based on the F table, the F_{table} price obtained at a significance level of 5% is 4.08. Comparison of F_{count} with F_{table} shows that $F_{count}> F_{table}$ so that the results of this study are significant.

Discussion of research results and hypothesis testing concerns the learning outcomes of science students who take part in learning using the Student Facilitator and Exsplaining (SFAE) learning model assisted by Mind Mapping in the experimental group and students who take learning using conventional

learning in the Control group. In this study shows that there is an effective effect and differences in student learning outcomes.

Descriptively, the science learning outcomes of the Experiment group students were Higher compared to the Control group students. This review is based on the average of the sectors and the trends of the sectors which were obtained in both groups. The average science learning outcomes in the Experiment group was 81.30, (very high category), while the average score of learning outcomes in the Control group was 61.54, (high category). It is already seen that the average learning outcomes of the experimental group are higher than the average learning outcomes in the control group.

Based on the discussion about the effect of the evective implementation of the Student Facilitator and Exsplaining (SFAE) model assisted by Mind Mapping on the Science Learning Outcomes of Class V students of Class VI of Kintamani Subdistrict, Bangli Regency, Academic Year 2017/1018. Obtaining the results of the data analysis of science learning outcomes using the t-test obtained t = 13.34 and ES = 2.93 because of that it can be concluded that the Learning Facilitating Student Facilitator (SFAE) learning model is assisted by Mind Mapping on the Science learning outcomes of students in the fifth grade at Elementary School Cluster VI Kintamani District has a high effectiveness (0.8 <2.93). This is because the Student Facilitator and Exsplaining (SFAE) Assisted Learning Model Mind Mapping is a learning model that involves students in the learning process as well as explaining learning material to their friends and giving input and asking questions so that the learning process students understand more quickly about the material that has been learned.

Followed by a discussion about the differences in student learning outcomes between students who are taught with the Student Facilitator and Exsplaining (SFAE) learning model assisted by Mind Mapping in the experimental group and students who are taught by conventional learning in the control group, this can be seen from the ANAVA-test results A. which obtained Fh = 28.42 and Ftable at a significant level of 5% with db 41 is 4.08. This means Fantar> Ftable so H0 is rejected. Thus there are differences in learning outcomes of students who take learning with the Student Facilitator And Explaining model assisted by Mind Mapping in the experimental group and students who take conventional learning in the control group class V in Elementary School Cluster VI Kintamani District, Bangli Regency.

The magnitude of the influence and differences in science learning outcomes by applying the Student Facilitator and Exsplaining (SFAE) learning model and those not learning with the Student Facilitator And Exsplaining (SFAE) model for the science learning outcomes, are due to several factors, namely (1) giving treatment in the form of SFAE-assisted learning models mind mapping learned in the experimental group, and (2) mind mapping assistance in the SFAE model. Explanation of the factors related to science learning outcomes is as follows.

The first factor is, Giving treatment in the form of SFAE learning models in the learning process in the experimental class, learning with the SFAE model causes increased activity, and students' enjoyment, it is because the steps of the SFAE learning model provide opportunities for students to become facilitators by providing opportunities to students to explain the material to other friends, this is in accordance with the opinions of Kurniasih & Sani (2015: 79). "States that the Student Facilitator And Explaining learning model is a learning model that trains students to be able to present their ideas or ideas to their peers". This SFAE model consists of 3 steps: the core stages, (1) Demonstrating or presenting outlines of learning material, (2) Forming groups, and (3) Providing opportunities for students to explain material to other students. The explanation of the steps in the SFAE model is as follows.

In the first step the teacher demonstrates or presents an outline of the learning material to be learned. This is done for students to know the material to be studied, this activity aims to shape students' initial knowledge so that students become motivated in following the learning process. This is in line with Roosyana (2016) states that "Presentation of Information directs students in answering questions that are guiding and digging in apperception.

In the second step, forming a study group, in this SFAE model the formation of a heterogeneous study group with 4-5 people. The purpose of forming this learning group aims to create a different learning atmosphere and make students learn in collaboration with group members, this is in line with Mahardika's statement (2015) which states the use of small groups in learning will make it easier for students to share their knowledge with other students.

In the third step which is to give an opportunity for students to explain to other students. This step aims to provide students with experience to become teachers and students learn to explain to other students and provide opportunities for students to explain the material or describe ideas / opinions to other fellow participants. This is in line with the statement Mulyani, (2016) which states that giving students the opportunity to explain the material that they understand to other students, this certainly can make students more optimal understanding of the material.

The second factor is, mind mapping assistance in the SFAE model. Mind mapping can develop students' mindset in exploring creative ideas in supporting learning activities and be able to describe and map the contents of thoughts into an image or graphic so that it can help record, strengthen, and recall information that has been learned,

By applying the SFAE model assisted with mind mapping, making students more active in the learning process so that learning becomes more useful, enjoyable, and has a positive effect on the learning outcomes of Natural Sciences.

4. Conclusion

Based on the results of hypothesis testing and discussion, the conclusions from this study are as follows. There is an effective effect on the implementation of the Student Facilitator and Explaining Assisted Mind Mapping learning model on the learning outcomes of Class V students in Elementary School Cluster VI, Kintamani District. From the results of the analysis using the t test it can be seen that the value of t = 13.34 after obtaining the results of the t test was continued by testing the effectiveness level which obtained the ES = 2.93. Natural Sciences Class V students in Elementary School Group VI Kintamani District Bangli Regency have high effectiveness. There is a difference in the learning outcomes of science between students who take learning with the learning model of Student Facilitator and Explaining Assisted by Mind Mapping and students who take conventional learning in fifth grade students in Elementary School VI Class Kintamani District. The analysis shows the value of F_{table} = 28.42 and F table at a significant level of 5% with db 41 is 4.08. This means F_{count}> F_{table} so H0 is rejected. Thus there are differences in post-test learning outcomes in the experimental group and control class V in Elementary School Cluster VI Kintamani District, Bangli Regency.

Based on the explanation above, it can be concluded that learning using the Student Facilitator and Explaining Assisted Learning Mind Mapping learning model has an effective effect and there are differences in the learning outcomes of Natural Sciences in fifth grade students in Elementary School VI District Kintamani.onclusion contains the main points derived from the discussion of the findings previously. Suggestions that can be delivered based on research that has been done are as follows. Suggest to students is to be more motivated in following the learning given by the teacher, so as to improve learning outcomes in each subject. It is recommended that teachers apply the Student Facilitator and Explaining Assisted Mind Mapping learning model because the research results prove that the use of the learning model. Student Facilitator and Explaining Assisted by Mind Mapping can improve student learning outcomes. Suggest to the principal in order to be able to use the results of this study as reference material for guiding teachers in carrying out learning. The last is suggest to other researchers so that the results of this study can be used as a reference library to conduct research on the same variable or on different variables.

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