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APPLICATION OF THE STEAM APPROACH TO INCREASE LEARNING OUTCOMES FOR THEME 4 STUDENTS OF CLASS IVB SD NEGERI 0411 PASAR UJUNG BATU T.P 2020/2021

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Abstract, *The background of this research is the low student learning outcomes which are marked by the number of student scores who have not reached the KKM, this is because the method used by the teacher does not attract the attention of students. The purpose of this study was to determine the improvement of learning outcomes in theme 4 through the STEAM approach to the fourth grade students of SD Negeri 0411 Pasar Ujung Batu. This research is classroom action research which consists of 2 cycles, namely cycle I and cycle II. The data sources in this study were the fourth grade students of SD Negeri 0411 Pasar Ujung Batu, totaling 25 students in the 2020/2021 school year and the sample was determined by the entire population. The data are the results of the initial test, the results of the final test. Data analysis techniques through quantitative and qualitative approaches. The results of the initial test in this study obtained a percentage (34.7%) in the first cycle (60.9%) and (100%) in the second cycle. It was concluded that the STEAM approach could improve the learning outcomes of fourth graders at SD Negeri 0411 Pasar Ujung Batu on theme 4.*

Keywords *:* Learning Outcomes, Natural Resources, STEAM Approach.

I. INTRODUCTION

The existence of learning innovation, teachers have difficulty developing it in learning. The same is true for science teachers. Many science teachers in their learning are still less varied in using the learning approach this causes student learning outcomes to decrease. Meanwhile, to instill a concept, especially in the field of science, it is necessary to apply a certain approach. Sumrall (Asy'ari: 2006) reveals that one of the reasons teachers use less method or approach which varies allegedly because it requires thinking, preparation, and class management that relatively difficult. Based on the observations of researchers as guardians of class IV SD Negeri 0411 Pasar Ujung Batu In the 2020/2021 academic year it was found that the learning outcomes for theme 4 had not yet reached the predetermined KKM value is 65.

The problem above occurs because most teachers do not understand the concept of theme 4 itself, so teachers experience confusion in teaching it. Teachers do not understand how to develop learning in accordance with the demands and needs of

students because they are used to teaching by giving lectures so that what is conveyed to students is not optimal. Coupled with students who do not master the concept of science, especially on the subject of natural resources, there are indications that students have not been active in the learning process. Teachers also have not used an appropriate approach to students. One solution that can improve student learning outcomes is to use the STEAM approach. The STEAM approach can allow students to connect their knowledge in the fields of science, technology, engineering and mathematics. So it is expected that student learning outcomes can increase. As stated (Daryanto. 2014:13).

Classroom Action Research (CAR) is a translation of Classroom Research, which is an action research conducted by teachers in their own classrooms through self-reflection, with the aim of improving their performance as teachers, so that student learning outcomes are increased. CAR in research conducted by teachers in their own classrooms through self-reflection with the aim of improving the quality of the learning process in the classroom, so that student learning outcomes can be improved. Classroom Action Research (CAR) is a variety of classroom-context learning research conducted by teachers to solve learning problems faced by teachers, improve the quality and learning outcomes and try out new learning things for the sake of improving the quality and learning outcomes. (Kemmis and Mc Taggart. 1990:34). The STEAM approach can enable students to connect their knowledge in the fields of science, technology, engineering and mathematics. So it is expected that student learning outcomes can increase. As stated by the scientific approach is learning that uses scientific rules. The scientific approach or scientific method generally contains a series of data collection activities through observation, questioning, experimentation, processing information or data, then communicating (Kemendikbud, 2014:19).

Learning using a scientific approach has characteristics and principles. According to Hosnan (2014:36) the scientific approach has the following characteristics: (1) Student-centered; 2) Involving science process skills in constructing concepts, laws or principles; 3) Involving potential cognitive processes in stimulating intellectual development, especially students' higher order thinking skills; 4) Can develop students' character. In addition to the characteristics, Hosnan (2014:37) also mentions the principles of learning with a scientific approach, namely: 1) Student-centered learning; 2) Learning to form students' self-concept; 3) Learning to avoid verbalism; 4) Learning provides opportunities for students to assimilate and

accommodate concepts, laws, and principles; 5) Learning encourages the improvement of students' thinking skills; 6) Learning increases students' learning motivation and teacher's teaching motivation; 7) Provide opportunities for students to practice communication skills; 8) There is a validation process for concepts, laws, and principles that are constructed by students in their cognitive structures.

II. RESEARCH METHODOLOGY

The research subjects in this research study were Grade IV students of SD Negeri 0411 Pasar Ujung Batu consisting of 10 male students and 13 female students. Research This was carried out at SD Negeri 0411 Pasar Ujung Batu. Time of Implementation This research was carried out in a period of 1 month, from October to November 2020 . Completeness Criteria In this study, it is said that the cycle is complete if the student's score is above 75% above.

KKM (from a total of one class). The data collection techniques and instruments in this study are with learning outcomes tests, student learning activities are instruments using learning outcomes test questions and student activity observation sheets. Data analysis is calculated using statistics simple, namely To assess the test or formative test. Researchers do the sum of the values of obtained by students, which is then divided by the number of students in the class so that the average formative test can be formulated:

$$\bar{X} = \frac{\sum X}{\sum N}$$

With : X = Average value

X = Sum of all student scores

N = Number of students

The description of the actions in the first cycle is done to identify the problem, The problems in class V are low student learning outcomes. Next to do learning planning that will be applied in teaching and learning activities by STEAM approach and prepare the necessary resources, materials and tools during the activity learning takes place. And determine the learning scenario. Compiling worksheets students. Develop evaluation format and develop observation format. Implementation actions are carried out by implementing actions that refer to the implementation plan rencana learning, namely applying the STEAM approach in learning the 4 resource theme natural. Next, make observations on learning by using STEAM approach, and assessing the results of observations that have been made to students.

Reflection carried out to evaluate the actions that have been taken. And have a meeting for discuss the results of the

evaluation of learning scenarios and student worksheet formats as well as improve the implementation of actions in accordance with the results of the evaluation for use in the cycle next.

The implementation of Cycle II begins with re-planning and identification problems that arise in the first cycle, namely the low learning outcomes, then determine the indicators of achievement of learning outcomes about natural resources and carrying out development program of action II. The implementation of the second cycle of actions refers to the identification of problems that appears in the first cycle in accordance with the predetermined alternative problem solving, namely: by using the next STEAM approach as in cycle I observations in accordance with the format that has been prepared and record all the things that that occur during the execution of the action. And judge the result of action according to the specified format.

The reflection implementation aims to evaluate the Cycle II actions based on the data collected, and discussing the results of the evaluation of learning scenarios in cycle II and making conclusions on the implementation of learning Scientific approach in improving learning outcomes on the 4 theme focused on Language lessons Indonesia class IVB SD Negeri 0411 Pasar Ujung Batu.

III. RESEARCH RESULTS AND DISCUSSION

Research result

Description of Initial Conditions

Pre-action activities are carried out to obtain initial data regarding learning outcomes students on theme 4 natural resources. The results of the initial observations before the action show that learning is teacher-centered, students look passive during learning, teachers do provide guidance when working, but because it is not clear when delivering the theme, many questions arise that cause ineffective learning because the teacher has to repeat each theme 4 directly to every student who asks when giving guidance. From result The test obtained data in the form of numbers regarding the value of each student. Data complete learning in the initial conditions can be seen in the table below:

Table 1. Student Learning Completeness Pre-Cycle Test Results

No.	Mastery learning	Total students Pre Cycle	
		Amount	Percent
1	Complete	8	34.7%
2	Unfinished	15	65.2%
Amount		23	100%

Based on the data in table 1 above, it is known that the fourth grade students of SD Negeri 0411 Pasar Ujung Batu who scored less than KKM 65 were 15 students. Therefore the number of students who achieve the minimum learning mastery of theme 4 natural resources is 8 students (34.7%) Meanwhile, 15 students (65.2%) have not achieved completeness.

The action planning stage of the researcher prepares a learning device consisting of: From the lesson plan of cycle 1, at this stage the researcher is still focusing on learning students in absorbing theme 4 natural resources. Researchers draw up an Implementation Plan Learning (RPP) according to the indicators to be achieved, then the implementation of the action includes activities: formulating problems, designing problem solving. create and develop learning models, apply learning models, evaluation, communication and do reflection. The final stage includes closing activities, making conclusions from the themes that have been studied, students and teachers reflect on student learning given positive feedback on the learning that has been implemented. Results of the implementation of cycle I can be seen in the following table:

Table 2. Results of the Recap of Cycle I . test scores

No	Results (number)	Results (Alphabet)	Meaning (Symbol)	Amount Student	Persent
1	81-100	A	Very	2	8,70%
2	71-80	B	Good	6	26,10%
3	61-70	C	Enough	6	26,10%
4	51-60	D	Less	7	30,40%
5	<50	E	Very less	2	8,70%
			Jumlah	23	100%

The results of the first cycle test, showed that the results that achieved the value of A (very good) were 2 students (8.7%), while those who got a B (good) score were 6 students or (26.1%), while of the number of students who still get a C (enough) as many as 6 students (26.1%) while there were 7 students (30.4%) who got a D (less) score, while those who got an E (very less) 2 students or 8.7%. Student learning completeness of the first cycle test results can be seen in table 3 the following :

Table 3. Student Learning Completeness Test Results Cycle I

No	Completeness	Total Student	
		Amount	Persent
1.	Complete	14	60,90%
2.	Not Completed	9	39,10%
	Amount	23	100%

Based on the students' learning completeness of a total of 23 students there are 14 or (60.9%) who have achieved mastery of learning. Meanwhile, 9 students or 39.1% have not reached completeness. Observations are carried out on all face-to-face activities, in this case Observations were made by 2 (two) observers, namely class teachers (colleagues) at SD Negeri 0411 Pasar Ujung Batu. Observations are carried out to find out in detail the students in understanding the theme 44 themes 4 natural resources. The results of observations are used as reflection material and to planning an action plan in cycle II. Interviews were carried out during face-to-face activities face after finishing the discussion. Interview activities were carried out by the teacher on several members of the group. Interviews are needed to find out the extent to which students feel in understand the theme of 4 natural resources. The results of the interviews were also used as material for reflection. Based on the results of the initial ability test, the results of the first cycle ability test can be seen there is a reduction in the number of students who are still below the minimum completeness criteria. On pre cycle the number of students who are under the KKM as many as 15 children and at the end of the first cycle decreases to 9. Comparison of mastery learning between pre-cycle and cycle I can be seen in table 4 below:

Table 4. Comparison of Mastery Learning Between Pre-Cycle and Cycle I

No	Completeness	Jumlah Siswa			
		Pre Cycle		Cycle I	
		Amount	Persent	Amount	Persent
1.	Complete	8	34,70%	14	60,90%
2.	Not Completed	15	65,20%	9	39,10%
Amount		23	100%	23	100%

Based on the data in table 4 above, it can be concluded that learning with the STEAM approach is able to improve learning outcomes, especially the theme 4 natural resources. Although there has been an increase as mentioned above, the results are not optimal. Therefore, it is necessary to improve learning in cycle II.

Description of Cycle 2

Based on the results of the reflection in the first cycle, the implementation of the actions in the second cycle can be described as follows: action planning in cycle II is carried out by selecting the theme of 4 natural resources and preparing the Implementation Plan Learning. The time allocation for this activity is 2x35 minutes with 2 face-to-face sessions advance. Next is the formation of student groups. In cycle II, the method The learning method used is the STEAM approach packaged in the form of questions which is competed between groups, so students are divided into 5 groups to discuss. The implementation of learning activities in cycle II is essentially a improvement of the conditions of the first cycle, the theme of the 4 lessons in the second cycle is the theme of natural resources. Based on the chosen theme, then proceed with making a plan Implementation of Learning (RPP).

The implementation of the actions in the second cycle was carried out in the fourth grade of SD Negeri 0411 Pasar Ujung Batu with 23 students. The learning steps are carried out according to with RPP using the STEAM approach. Observations were carried out on face-to-face activities, in this case observations are carried out by 2 (two) observers, namely class IV teachers guru SD Negeri 0411 Pasar Ujung Batu. Observations were carried out to determine student activities in real time directly in the learning process. The results of observations are used as reflection material. Results Observations in cycle II can be described as in table 7 below:

Table 5. Results of the Recap of Cycle II . test scores

No	Results (number)	Results (Alphabet)	Meaning (Symbol)	Amount Student	Persent
1	81-100	A	Very	5	21,8%
2	71-80	B	Good	9	39,1%
3	61-70	C	Enough	9	39,1%
4	51-60	D	Less	0	
5	<50	E	Very less	0	
			Jumlah	23	100%

From Table 5 above it can be seen that students who get very good scores (A) is 21.8% or 5 students, while the most who get good grades (B) are 39.1% or 9 students.

And those who get a C (enough) are 39.1% or as many as 9 students. Learning completeness in cycle II can be tabulated as in Table 6.

Table 6. Student Learning Completeness Test Results Cycle II

No	Completeness	Total Student	
		Amount	Persent
1.	Complete	23	100%
2.	Not Completed	0	0%
	Amount	23	100%

Based on the data above, it is known that students who achieve mastery as many as 23 students (100%) which means there has been an increase. Interview is required for determine the extent to which students' skills in understanding, integrating with their eyes, another lesson. In addition, interviews were used to identify difficulties experienced by students. The results of the interviews were used as reflection material. Based on value the results of the first cycle and the value of the results of the second cycle can be seen that the learning applying the STEAM method can improve students' abilities, especially the theme 4 theme 44 theme 4 natural resources. For more details in table 9, the results of the reflection are described below in cycle II.

Table 7. Comparison of Test Values of Cycle I and Cycle II Models

No	Test Results	Number of Successful Students	
		Cycle I	Cycle II
1	A (81 -100)	2	5
2	B (71-80)	6	9
3	C (61-70)	6	9
4	D (51-60)	7	-
5	E (< 50)	2	-
	Amount	23	23

Based on the information in table 9 above, it can be concluded that through the STEAM can improve learning achievement in fourth grade students of SD Negeri 0411 Pasar Ujung Batu especially on theme 4 natural resources.

Discussion

The application of the STEAM approach is an integrated learning approach that encourage students to think more broadly about real-world problems. Action Research This class (CAR) is carried out by applying two learning cycles with a different approach the same in each cycle, namely the STEAM Approach. Classroom Action Research (Classroom Action Research) was carried out in two cycles. Each cycle is carried out in four stages, namely: (1) action planning, (2) action implementation, (3) observation (4) reflection. The STEAM approach is intended to provide students with understanding in recognize, understand and observe various materials using a scientific approach, that information can come from anywhere, at any time, does not depend on unidirectional information from teachers

can also be from the surrounding environment. The learning process using the . approach other. Based on the results of the study, it can be stated that through the STEAM approach, directed so that students are able to formulate problems (with a lot of asking, communicating, exploring, associating), not just solving problem with just answering. The learning process is expected to train analytical thinking (students are taught how to make decisions) not mechanistic thinking (routine) by simply listening and memorizing (Majid, 2014: 194)

Pre-cycle results, showing that the results that reach the value of A (very good) are 0 students (0%), while those who got a B (good) score were 3 students or (13.4%), while of the number of students who still get a C (enough) as many as 5 students (21.7%) while there were 7 students (30.4%) who got a D (less) score, while those who got an E (very less) 8 students or (34.7%). Based on these data, the fourth grade students of SD Negeri 0411 Pasar Ujung Batu who has a score less than KKM 65 as many as 15 students (65.2%). With Thus the number of students who achieve mastery learning minimum theme 4 natural resources as many as 8 students (34.7%). In the learning process before the action shows that teacher-centered learning, students look passive during learning, some students attention is not focused on learning, teachers tend to use expository and more emphasis on mastery of the material than the learning process. Student given a brief explanation of a material, then asked to work on the questions.

The results of the first cycle test, showed that the results that achieved an A (very good) score were 2 students (8.7%), while those who got B (good) were 6 students or (26.1%), while from the number of students who still get a C (enough) as many as 6 students (26.1%) while those who get a D (less) are 7 students (30.4%), while those who get E score (very poor) 2 students or 8.7%. Based on the results of the initial ability test with The results of the first cycle of ability tests can be seen that there is a reduction in the number of students who are still in school under the Minimum completeness criteria. In the pre-cycle the number of students below the KKM as many as 15 children and at the end of the first cycle it was reduced to 9. Student learning outcomes began active and give a positive response. The results of the second cycle test are known that those who get the very good (A) is 21.8% or 5 students, while the highest score is good (B) is 39.1% or 9 students. And the score of C (enough) is 39.1% or as many as 9 students. While there are no D and E scores. Learning is ongoing in a better direction, students are more active so that the minimum completeness criteria is achieved, namely 65. Improving

student learning outcomes is a process of developing professional competence of teachers (Hartini, 2019). The results of this study prove that the professional competence of teachers through research (Supriyanto, Hartini, Syamsudin, and Sutoyo, 2019).

IV. CONCLUSION

Based on the results of research and discussion, it can be concluded that the application of the STEAM approach can improve student learning outcomes in the theme of science subjects 4 natural energy resources in class IV at SD Negeri 0411 Pasar Ujung Batu. It is seen in the percentage of completeness that is respectively 34.7% in the pre-cycle and 60.9% in the first cycle and 100% in cycle II. The STEAM approach model has been carried out in 2 cycles, each cycle is carried out carried out in 2x meetings overall the implementation of the STEAM model has been improve student learning outcomes. This is evident from the average student achievement and the number of students students who reach the limit of mastery. In cycle 1 the average value of students 76.25% has occurred an increase in the average value of 86.25%. Based on the results of research and discussion then it can be concluded that the application of the STEAM approach can improve student learning outcomes in the science subject, theme 4 energy natural resources in class IV at SD Negeri 0411 Pasar Ujung Batu. The application of the STEAM model in detail can improve learning outcomes. Students are invited to participate in all learning processes so that learning makes students feel happy and active in learning so that it can increase student interest in learning and actively participate

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