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Increasing Elementary School Students' Science Learning Outcomes through the Inquiry Approach

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Abstrak

Penelitian tindakan kelas ini bertujuan untuk mengetahui seberapa besar peningkatan aktivitas belajar dan hasil belajar siswa kelas V SD Negeri Mangkura III Makassar, pada pembelajaran IPA dengan menggunakan pendekatan inkuiri. Subjek penelitian ini adalah siswa kelas V SD Negeri Mangkura III Makassar yang berjumlah 29 orang yang terdiri dari 17 siswa laki-laki dan 12 siswa perempuan. Penelitian ini dilaksanakan dalam tiga siklus dan setiap siklus terdiri dari empat komponen utama, yaitu: (1) perencanaan tindakan, (2) pelaksanaan tindakan, (3) observasi dan evaluasi, dan (4) analisis dan refleksi. Untuk mengumpulkan data hasil belajar digunakan lembar observasi. Selanjutnya data yang diperoleh dianalisis menggunakan analisis kualitatif dan kuantitatif. Hasil penelitian mengungkapkan bahwa aktivitas belajar dan hasil belajar pada pembelajaran IPA dengan pendekatan inkuiri mengalami peningkatan. Hal ini dibuktikan dengan peningkatan rata-rata skor yang diperoleh dan tingginya persentase siswa yang memiliki hasil belajar sangat tinggi, serta meningkatnya persentase aktivitas belajar siswa.
Kata Kunci: Hasil Belajar, Aktivitas, Pendekatan Inkuiri.

Abstract

This action research aims to determine how much increase in learning activities and learning outcomes of fifth-grade students at SD Negeri Mangkura III Makassar. The inquiry approach in science learning is used in this study. The subjects of this study were fifth-grade students of SD Negeri Mangkura III Makassar, with a population of 29 people consisting of 17 male students and 12 female students. This research was carried out in three cycles and each cycle consisted of four main components, namely: (1) action planning, (2) action implementation, (3) observation and evaluation, and (4) analysis and reflection. To collect data on learning outcomes used observation sheets. Furthermore, the data obtained were analyzed using qualitative and quantitative analysis. The results of the study revealed that learning activities and learning outcomes in science learning with an inquiry approach had increased. This is evidenced by the increase in the average score obtained and the high percentage of students who have very high learning outcomes, as well as the increasing percentage of student learning activities.
Keywords: *Learning Outcomes, Activities, Inquiry Approach*

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INTRODUCTION

Nature and all of its components are the focus of the natural sciences. Science is concerned with cause and effect, specifically the connection between natural events. Natural sciences (IPA), according to Powler Jufrida et al., (2019), are an organized and methodical branch of study that deals with physical phenomena and is primarily based on observation and induction. Natural science is defined as information that is systematic or structured in a regular, widely acknowledged manner and in the form of a collection of data from observations and experiments by (Alkhalaf et al., 2017). Given that science activities are almost usually tied to experiments that call for expertise and craftsmanship Science is a science that studies the universe and its contents, along with the events that occur in it which were developed by experts based on the scientific process Smyrnaiou et al., (2020);Afandi et al., (2019). In addition, science is also seen as a process, as a product, and as a procedure. Science has contributed greatly to the development of science and technology that has developed from ancient times to modern times as it is today Fukuda, (2020);Magana et al., (2021);Atmojo et al., (2020). So it is not an exaggeration to say that science grows and develops along with the journey of human life. Thus, science should be a very interesting lesson, easy to understand and not boring. However, the reality is that science subjects are considered scary and difficult to understand in schools so that most students' interest in learning science is low. Farozin et al., (2020);Rini, (2017) states that learning is an active process in which students engage with their environment by exploring and manipulating objects, asking questions, and conducting experiments. This article claims that creating one's own concepts and principles while studying is the best approach for one to begin to understand them. The weakness of science learning in developing teaching methods or models that emphasize more on memory Fadillah et al., (2017);Magana et al., (2021). The lecture approach, which incidentally is the simplest and cheapest way, is usually used by teachers to communicate science concepts and materials in the current state of science learning. The low interest of students in learning science lies in the teaching method provided by the teacher (Nipriyansyah, 2021). Where they are always faced with formulas, Latin, LKS so that many students only copy assignments from their friends without trying to actively participate in completing the tasks given.

According Supena et al., (2021);Sri, (2021) to this view, the science learning model used from the past until now is still traditional or teacher-centered, with the delivery system being dominated by the teacher and the communication process being one-way. While students sit quietly and acquire knowledge and skills, the teacher exercises active control. The Student Center screamed softly and was afraid to express those thoughts. Independence and creativity are stunted and do not even develop. In addition, the phenomenon that students often show difficulties in learning science is that students are less actively involved in the teaching and learning process, even though in everyday reality there are students who are active in the teaching and learning process, students sometimes quickly forget a subject matter even though the material is just taught. This makes the next material difficult for students to understand. Teachers are considered required to adjust the learning tactics used to overcome this. Teachers are expected to place more emphasis on process than results and involve students personally in learning to ensure that science teaching is relevant (Huang et al., 2020). Teachers should adopt a contextual perspective to modify their teaching and learning methods. With a contextual approach, students are required to maximize their own abilities to complete a number of learning activities (Hansson et al., 2020). It's important to apply innovation to make learning more interesting so it doesn't feel dry. Among the innovative projects. Using a guided inquiry approach, this was achieved. Siahaan et al., (2020) defines inquiry as a general procedure that people use to find or understand information. According to Sotáková et al., (2020);García-Carmona, (2020), "inquiry is a strategy used in science education that describes a means to show, seek knowledge or information, or investigate a phenomenon. "*There are six processes that need to be considered in the implementation of guided inquiry*," suggested Zhang & Cobern, (2021);Manurung, (2021), "namely: (1) defining the problem, (2) making hypotheses, (3) planning activities, (4) carrying out activities, (5) collect data,

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and (6) draw conclusions." Investigation in six steps, This type of directed learning is very important for the teaching and learning process that takes place in the classroom. Students will actively participate in developing their courage, communicating, and trying to learn on their own to overcome the problems they face. It is the teacher's responsibility to develop learning scenarios to ensure efficient learning. One way to increase learning activity and student learning outcomes is to give learning assignments both in groups and individually Wahono et al., (2020);Safitri et al., (2020). Because with the support of fellow students and the diversity of opinions, knowledge, and skills, it will help make the learning atmosphere together become a valuable thing from the learning climate in the classroom (Guo et al., 2020). The results of research studies conducted (Purnamasari, 2018) with the title Improving Science Learning Outcomes of Elementary School Students through Guided Inquiry Learning Model. The results of the first cycle of observations in the first meeting showed that teacher activity was sufficient (55%), the second meeting was good (65%), and the third meeting was also good (85%). For the second cycle, The observed teacher activity increased to the very good category (85%), and as expected, the student activity also increased to the very good category (95%). The percentage of student activity in carrying out learning in the first cycle of meeting 1 and meeting 2 is in the sufficient category, 50% and 60% respectively, and meeting 3 is 85% (very good). While in the second cycle meeting 1 85% (good) and meeting II 95% (very good). Based on data results analysis and discussion, the average score of students before the application of the guided inquiry learning model was 59.83, then increased to 72.17 in the first cycle and increased again in the second cycle to 80.17. However, such a situation is not always effective.

There may be unequal participation, poor communication, and confusion, so as not to create a real learning atmosphere. Therefore, it is necessary to design teaching strategies to maximize the benefits of learning and minimize gaps so that it can help students to be able to increase their active learning and learning outcomes.

METHOD

The subject of the research was the fifth grade students at SD Negeri Mangkura III Makassar as many as 29 students consisting of 12 female students and 17 male students, who were taught directly by the author. This research is a classroom action research that will be carried out in 3 cycles, each cycle is carried out according to the changes to be achieved Nurhasanah et al., (2020);Yulianti et al., (2018). The three cycles are a series of interrelated activities, meaning that the implementation of cycle III is a continuation of cycle II, and cycle II is a continuation of cycle I. The data collected will be analyzed using quantitative analysis and qualitative analysis. For quantitative analysis, descriptive analysis is used, namely the average score and percentage.

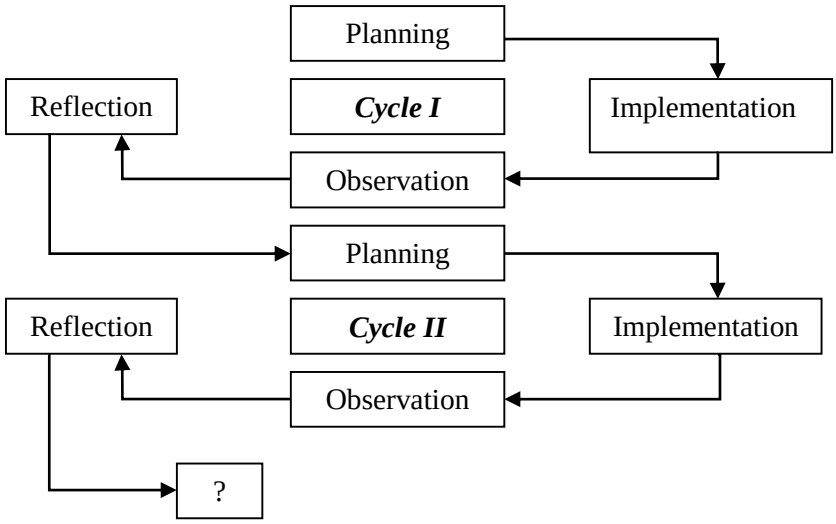

Figure 1. Schematic of Classroom Action Research (CAR) Model Kemmis & MC Tagga

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RESULTS AND DISCUSSION

Result

Analysis Descriptive Ability Beginning Student

Description of learning outcomes students based on midterm exam results II grade V elementary school students Country Mangkura III Makassar, which then made score ability beginning which served like table 1 following this:

Table 1
Statistics Score Ability BeginningStudents

Statistics	Score Statistics
Subject	29
Score ideal	100
Score highest	80
Score Lowest	40
Range score	40
Score average	61.03
median	60
Standard deviation	10.8

If score results study student grouped, to in 3 category so obtained frequencyscore like shown in table 2 below:

Table 2
Distribution Frequency and Percentage Score

No.	Score	Category	freq	Percentage
1.	< 50	Low	4	13.79 %
2.	50-52	Currently	21	72.42 %
3.	> 72	Tall	4	13.79%
Amount			29	100 %

Analysis Description results Test Cycle I

From analysis description score acquisition student after application learning method *inquiry d*uring cycle I, served on table 3 below:

Table 3
Statistics Score Results Study on Cycle I

Statistics	Score Statistics
Subject	29
Score ideal	100
Score highest	90
Score Lowest	45
Range score	45
Score average	66.83
Median	67
Standard deviation	10.43

If score results study student grouped to in 3 category so acquisition distributionfrequency and percentage like showed on table in lower this:

Table 4
Distribution Frequency and Percentage Score Results Study on Cycle I

No.	Score	Category	Frequency	Percentage
1.	< 56	Low	6	20.69 %
2.	56-51	Currently	19	65.52 %
3.	>71	Tall	4	13.79%

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Amount	29	100 %

Analysis Description Results Test Cycle II

From analysis description there is score acquisition student after application learning method *inquiry d*uring cycle II, served on Table 5 below:

Table 5
Statistics Score Results Study Student on Cycle II

Statistics	Score Statistics
Subject	29
Score ideal	100
Score highest	98
Score Lowest	55
Range score	43
Score average	77.72
median	80
Standard deviation	9.88

If the student learning outcomes scores are grouped into 3 categories, the distribution gainscore frequency and percentage like showed on table in lower this:

Table 6
Distribution Frequency and Percentage Score Results Study Student on Cycle II

No.	Score	Category	Frequency	Percentage
1.	< 68	Low	5	17.24%
2.	68 – 88	Currently	20	68.97 %
3.	> 88	Tall	4	13.79
Amount			29	100

From the analysis of the results of the final test of Cycle II, there were 6 students who have not yet obtained learning outcomes good start cycle I until cycle II though has been given a repair program but result no far different from results previously and it turns out after asked which Becomes constraintso that they no can achieve good learning outcomes like other students among others, caused by shyness to ask friends, more time to play, and less control from students' parents while studying, so that the authors together with homeroom teacher attempted give instruction which could grow motivation they in study.

Analysis Description Results Cycle Test III

From analysis description there is score acquisition student after application learning method *inquiry* during cycle III and is presented in Table 7 below:

Table 7
Statistics Score Results Study Student on Cycle III

Statistics	Score Statistics
Subject	29
Score ideal	100
Score highest	98
Score Lowest	55
Range score	43
Score average	81.26
Median	85
Standard deviation	8.56

If score results study student grouped to in 3 category so acquisition distributionfrequency and percentage like showed on table in lower this:

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Table 8
Distribution Frequency and Percentage Score Results Study Student on Cycle III

No.	Score	Category	Frequency	Percentage
1.	< 73	Low	5	17.24 %
2.	73 – 90	Currently	18	62.07%
3.	> 90	Tall	6	20.69 %
Amount			29	100 %

After using the categorization and table 8. above, it can be seen that from 29 students of class V on SD Country Mangkura III Makassar which Becomes subject study it turns out all student succeedachieve mastery learning. This is because every student who gets score low from cycle I and cycle II.

From the average student mastery after being categorized starting from cycle I to cycle II and III, it can be seen that by applying the *inquiry approach* to science learning, it can be seen that give motivation new and sting study which good to student To use repair score theywhich previously not maximal become more good.

Discussion

Qualitative AnalysisCycle I

To find out changes in students' attitudes in the teaching and learning process, we can look atthe results of observations made on each meeting. Results This first cycle qualitative analysis will give description about change liveliness study student in follow lesson withuse approach *inquiries* .

Based on the results of the observations listed in the appendix, a summary can be made like which there is on table 9 below.

Table 9
Results Observation liveliness student on Cycle 1

No.	Indicator which observed	Silkus I			
		Meeting To -			
		1	2	3	4
1	Student which present	24	27	25	29
2	Student which submitquestion	4	3	3	10
3	Student which givecomment	3	5	5	5
4	Student which brave answerquestion from teacher		5	5	9
5	Student which indifferent not indifferent	5	4	4	1
6	Students doing activitiesother on moment process study teach	4	1	3	1
7	Serious students pay attentionTheory lesson which given	0	25	22	28
8	Students who dare to apply self working on practice questions at pagan write	4	5	6	l 3
9	Serious student at workgroup	19	27	24	28
10	Student which worktask/job house	-	27	22	28

On indicator second that is liveliness student submit question on process study teach. The number of students who asked questions at the first meeting was 4 studentsof the 24 students who attended. And there were 10 students from 29 students who attended the fourth meeting. Based on results observation cycle I it can be seen that there is an increase in the number of students which submit question. Thing this caused because student for first time taught by person other besides their classroom teacher. So there is a nature of shame to ask. On this basis, the teacher give motivation will the importance of asking questions.

The number of students who did other activities during the teaching and learning process also experienced decrease that is on At the beginning of the first cycle there were 4 students from 24 students who attended and at the last meeting of the first cycle in the teaching and learning process as many as 1 student from 29 students present. Other activities of students during the teaching and learning process include: storytelling and drawing. With special attention to students who enjoy doing other activities during the learning process have a positive impact on activity learning that students often do. The positive impact that occurs is a decrease in the number

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of students who to do liveliness study other when process study teaching takes place.

The activity of students who dare to volunteer to work on practice questions on the blackboard also occurs enhancement. Seen at the first meeting of cycle I as many as 4 students from 24 student present and 13 students from 29 students who were present at the last meeting of cycle I. at the beginning of the student meeting most hesitant submit self to solve the problem practice to board write. Thing this caused by fear students make mistakes in doing the practice questions. Even though I'm afraid to perform, the teacher still appoints students to appear by emphasizing that to appear on the blackboard, answer not absolutely true but who main courage.

Activity student which work same in work group occur enhancement. With The number of students who are serious in each meeting increases. At the first meeting the number 19 students students of the 24 students who attended and at the four as much 28 students out of 20 students who attended. Student discipline in every assignment or work house amount student which stage task/job house the more increase.

Cycle II

To find out changes in students' attitudes in the teaching and learning process, we can look atthe results of observations made at each meeting. Results This first cycle qualitative analysis will give an overview about change student learning activity in following the lesson with use approach *inquiries* .

At each meeting, several students were present or follow learning process teach, ask questions, provide comments/responses, answer oral questions teacher, indifferent not indifferent, do activity other at the moment process study teach ongoing, pay attention to the subject matter presented by the teacher, dare volunteer to work practice questions to the blackboard, serious in group work, and do the task or work house. Based on results observation which listed on attachment so could made summaryas there is on table following.

Table 10
Results Observation Activity student on Cycle II

No.	Indicators that observed	Silkus II Meeting To -		
		1	2	3
1	Student which present	29	27	29
2	Student which submit question	8	9	10
3	Student which give comment	6	7	9
4	Students who dare to answer questionsfrom teacher	6	6	7
5	Student which indifferent not indifferent			
6	Students who To do activity other onmoment process study teach	4	4	1
7	Student which are you serious notice Theorylesson which given	1	23	27
8	Student which brave submit self work question practice in board write	8	9	9
9	Student which are you serious in work group	24	23	25
10	Student which work task/jobhouse	-	27	29

On indicator second that is liveliness student submit question on learning process teach. The number of students who asked questions at the first meeting was 8 studentsof 29 students who attended and there were 10 students from 29 students who attended the third meeting. Based on the results of the second cycle of observations, it can be seen that there was an increase in the number of students who submit question. Student which follow lesson very enthusiastic follow process study teach. Activity student submit question also responded positive between student. With there is an increase in the number of students who give feedback or good comments from friends them or from the teacher. The number of students who gave comments or responses was 6 students of the 29 students who present at first. At the third meeting as many as 9 students from 29 students whopresent. This shows that there is an increase in student activity in providing feedback or every comment meeting process study teach.

The activeness of students answering the teacher's oral questions was 6 students from 29 students present on beginning meeting and as much 7 student from 29 student which present on meeting to three. Withthereby.

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then it appears an increase in student activity in answering the teacher's oral questions. In addition, students who were indifferent experienced a decline. That is, at the first meeting there were 3 students and the end of the meeting in the second cycle as many as 1 student so that there is a decrease in the number of students students who are indifferent to the lessons being taught so this proves that interestor interest student in study IPA the more increase.

The activeness of students who dare to volunteer to work on practice questions on the blackboard too there is an increase. Seen at the first meeting of cycle II as many as 8 students from 29 students attended and 9 student from 29 student which present on meeting final from cycle II. On cycle II, student more compete to work on practice questions to the blackboard. By giving compliments to those whoright and giving motivation to students those who answered incorrectly turned out to give impact. Student feel there is appreciation which obtained. Attitude each other value must taught andimplanted on every student.

The activeness of students working together in group work increased. With looks the number of students who are serious in group work each meeting increases. At the meeting first cycle II amount student as much 24 person student from 29 student which present and on meetingthe third as many as 25 students from 29 students who attended. Student discipline in every assignmentor profession house, amount student which work task/job the house is getting increase. Seen in every assignment / homework has increased. Discipline applied such as collecting assignments/homework at the teacher's desk before school bell rings. Thus, students do not have the opportunity to copy (cheat) work student which other.

Cycle III

To find out changes in students' attitudes in the teaching and learning process, we can look atthe results of observations made on each meeting. Results this third cycle qualitative analysis will give description about change liveliness study student in follow lesson withuse approach *inquiries*.

Based on the results of the observations listed in the appendix, a summary can be made as there is on the following table.

Table 11
Results Activity observation student at Cycle III

		Cycle III		
		Meeting To -		
No.	**Indicators that observed**	**1**	**2**	**3**
1	Student which present	28	27	29
2	Student which submit question	9	9	16
3	Student which give comment	8	8	11
4	Student which brave answer question, from teacher	6	8	15
5	Student which indifferent not indifferent	1	1	1
6	Students who To do activity other on moment process study teach	1	2	-
7	Student which are you serious notice Theory lesson which given	26	26	28
8	Student which brave submit self work question practice in papas write	8	14	15
9	Serious student at work group	26	25	-
10	Student which work task/job house	27	25	29

By general liveliness students participating in the teaching and learning process do not experience problems as with other indicators. Problems that arise in the indicators of student activity following the teaching and learning process is meeting second, where students when learning to teach (alpa) because it doesn't happen on purpose anymore. So that the activeness of students following the learning process teach every meeting more increase. On indicator second that is liveliness student submit question on learning process teach. Amount student which submit question on meeting first as much 8 studentfrom 29 student which present and there is 16 student from 29 student present on meeting to three.

Based on the results of the third cycle observation, it can be seen that enhancement on the number of

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students which submit question. The activity of students also asking questions also received a positive response among students with the visible increase in students who gave good responses or comments came from their friends or from the teacher. The number of students who gave comments or responses was 8 students from 29 students who attended the first meeting. At the third meeting as many as 11 students from 29 student which present. This show that happened increasing student activity in provide comments or responses to each meeting in the teaching and learning process. Activity There was also an increase in students who dared to volunteer to work on practice questions on the blackboard. Seen at the first meeting of the cycle III as much 8 students from 28 students attended and 15 students from 29 students who were present at the last meeting of cycle I. At the beginning of the meeting most students hesitate to volunteer to complete the practice questions on the blackboard. This is due to fear students make a mistake in doing the practice questions the. Although afraid to appear, permanent teacher pointing student come on stage with emphasize that for come on stage to board write, answer no absolutetrue, however, which main courage

Reflection to Implementation ActionCycle III

In this third cycle, although there is still a tendency that occurs between students is who laugh at each other if there are students who are wrong in doing the questions or exercises on the board write, however Thing this no influence every student for lazy want to work question Exercise in board write, but at the end of the third cycle this incident was not found again because the students realize and get used to the importance of mutual respect between student. Not only that, between students have been taught to be able to respect each other student opinion others and in this cycle researcher also assisted in observing changes in student attitudes during the learning process learning in progress to maximize the results of the author's observations. And based on the results of reflection it can be concluded that there has been an increase in students' interest and motivation in learning science. Enhancement liveliness from cycle I arrived cycle III could also seen on table following:

Table 12
Results observation enhancement liveliness on cycle I until on cycle III

Indicator	Percentage (%)		
	Cycle I	Cycle II	Cycle III
Student which present	90.52	97.70	96.55
Student which submit question	17.24	31.03	39.08
Student which give comment	15.52	25.29 9	31.03
Student which brave answer question fromteacher	18.97	21.84	33.33
Student which indifferent not indifferent	12.07	8.05	3.45
Students who To do activity other on momentprocess study teach	8.62	10.34	5.17
Student which are you serious notice Theorylesson which given	81.90	81.61	91.95
Student which brave submit self work question practice in board write	24,14	29.89	42.53
Student which are you serious in work group	84.48	82.76	87.93
Student which work task/jobhouse	88.51	93.55	96.10

Several previous studies, including research conducted by Sri, (2021) with the title Improving Science Learning Outcomes for Elementary School Students Through Guided Inquiry Learning Models, where the results of the research were observations in the first cycle of the first meeting which showed that teacher activity was sufficient. (55%), the second meeting was good (65%), and the third meeting was also good (85%). For the second cycle, the observed teacher activity increased to the very good category (85%), and as expected, the student activity also increased to the very good category (95%). The percentage of student activity in carrying out learning in the first cycle of meeting 1 and meeting 2 is in the sufficient category, 50% and 60% respectively, and meeting 3 is 85% (very good). While in cycle II meeting 1 85% (good) and meeting II 95% (very good). In line with the research conducted by Fitria et al., (2021) with the title The Effect Of Scientific Approach On Elementary School Students' Learning Outcomes In Science Learning The findings of the study, when analyzed using the t-test, produced the value t-count = 2,179, while t-table = 1,680. Since t-count > t-table, the null

hypothesis H0 was refuted, and the alternative hypothesis H1 was accepted. These findings provide further evidence that a relationship exists between scientific methods and the knowledge that students acquire in the subject of science. The implication of this research can serve as a reference for instructors who are working to improve the learning outcomes in science at the primary school level.

CONCLUSION

Based on the results of the analysis and discussion of the data, several conclusions can be drawn. In the first cycle, namely in the learning outcomes data, there were still 5 out of 29 students in the low category and 2 out of 29 students in the low category. in the very high category. In the second cycle, namely in the learning outcomes data, there were no students from 29 students in the low category and 8 out of 29 students in the very high category. In cycle III, namely learning outcomes data, there were no students from 29 students in the low category and 18 from 29 students in the very high category. There was an increase in student learning outcomes and activities during the teaching and learning process based on student observation and reflection data.

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