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The Effect of Implementing Learning Models *Contextual Teaching and Learning* (CTL) toward Students' Science Learning Outcomes of Class IV Cluster Ii at Donggo, Bima Regency

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Abstrak

This research is an experimental study with a nonequivalent control group design which aims to determine: (1) An overview of the science learning model at SD Gugus II, Donggo District, Bima Regency (2) An overview of the application of science learning in SD Class IV Cluster II, Donggo District, Bima Regency using the model Contextual Teaching and Learning (CTL). (3) Overview of the learning outcomes of Class IV Science at Gugus II Elementary School, Donggo District, Bima Regency. (4) The effect of Contextual Teaching and Learning (CTL) model learning on Science Class IV Gusus II learning outcomes, Donggo District, Bima Regency. The population in this study were fourth grade students in Cluster II, Donggo District, Bima Regency, which consisted of SDN Inpres O'o, SDN O'o (Mpili), SDN Kamunti, SDN Inpres Kala, and SDN Manggekompo with a total of 74 students. While the samples used in this study were class IV SDN Kamunti as a control class, totaling 20 people and class IV at SDN Inpres O'o as an experimental class, totaling 23 people. The data from this study were obtained from learning outcomes tests with the subject matter of motion and style in the form of pretest and posttest as well as teacher and student activity observation sheets. The data analysis technique in this research is descriptive and inferential analysis. The results showed that: (1) The science learning model used in SD Gugus II, Donggo District, Bima Regency, was a lecture and group discussion learning model. (2) The application of Contextual Teaching and Learning (CTL) model learning in class IV SD Gugus II, Donggo District, Bima Regency has been in accordance with the implementation of learning where the teacher's teaching activities are in accordance with the set plan and the positive activity of students is high when compared to the previous implementation of the learning model Contextual Teaching and Learning (CTL). (3) The science learning outcomes of the control class (SDN Kamunti) students who applied the conventional learning model were lower than the results of the experimental class that applied the Contextual Teaching and Learning (CTL) learning model. (4) the application of the Contextual Teaching and Learning (CTL) learning model has a significant effect on the fourth grade science learning outcomes of SD Gugus II, Donggo District, Bima Regency. This is evidenced by the results of the Independent t-test. The t-test value is 5.344 and the t-table value is 2.019.

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1. INTRODUCTION

Learning in the 2013 curriculum (K13) uses a scientific approach, a scientific approach can use several strategies such as contextual learning. A learning model is a form of learning that has a name, characteristics, syntax, setting and culture, for example *discovery learning*, *project-based learning*, *problem-based learning, inquiry learning* and *contextual teaching and learning* (Permendiknas. 2016). Science learning, especially in elementary schools, provides direct experience in developing students' competence in exploring, understanding material by thinking and working scientifically.

In order to achieve learning that is in accordance with the 2013 curriculum, it must be adapted to the needs, character and abilities of students. Teachers need appropriate strategies, methods, learning models and media to facilitate students to work scientifically and help students understand the scope of science. According to Sulistyorini (Nugroho, 2013:13-14) that "SD/MI science content standards are related to how to find out about nature systematically, so that science is not just mastery of a collection of knowledge in the form of facts, concepts or principles. only, but it is also a process of discovery." Science learning is expected to be a vehicle for students to learn about themselves and the natural world around them, as well as prospects for further development in their application in everyday life.

Science lessons in elementary schools, especially class IV, are one of the subjects taught to students in the 2013 curriculum. The reality on the ground is that the learning process carried out in class IV elementary schools, especially cluster II, Donggo District, Bima Regency uses the 2013 curriculum. Even though the learning is implemented Science teachers carry out this in accordance with the General Learning Guidelines from the Minister of Education and Culture of the Republic of Indonesia Number 81 A. of 2013, namely using a scientific approach, but there are still students who experience difficulties in understanding concepts and finding connections between learning material and real-life situations. The problem faced after the author conducted a preliminary study at Cluster II Elementary School, Donggo

District, Bima Regency, was the weak learning system in teaching and learning activities in the classroom. This is about the lack of exploring students' potential. Apart from that, the learning models and methods use cooperatives with group discussion stages that are facilitated and guided by the teacher. However, the learning implemented by teachers does not yet provide science learning as a scientifically discovered learning process, teachers provide concepts and facts to students directly. As a result, students are passive and have difficulty understanding concepts in science learning that occur in the natural environment, so students tend to memorize them. So, students get bored quickly and it is not uncommon for students to sleep in class. This is because the quality and quantity of science learning facilities, such as media and teaching aids, are far from adequate.

Science learning must be able to train students to think critically and scientifically so that a teacher must always explore learning material in various ways that can encourage students to think scientifically (Syawaluddin, et al, 2019). To avoid science learning from being too verbalistic, the learning model that is most likely to be used by teachers in science learning is the contextual model. With the contextual model, it is hoped that science learning will not be verbalistic, students will be more directly involved in learning, and the results will be more effective. So far, we have admitted that science learning in elementary schools has not been supported by teacher insight, adequate preparation and tools. So, to overcome all these shortcomings, the use of contextual-based learning models is the most effective solution for improving science learning outcomes.

Contextual Teaching and Learning (CTL) is a model that is suitable for science learning which will have implications for good learning outcomes. This is reinforced by the results of research conducted by Ridwanullah, et al (2014) which states that learning using the learning model *Contextual Teaching and Learning* (CTL) has a quite good influence in improving science learning outcomes in elementary schools, because the problems presented in learning are related to students' real lives. Cooperative learning that involves students studying together in groups can improve student learning outcomes (Asis, et al, 2021). This is reinforced by the theory put forward by Sanjaya (2008:255). *Contextual Teaching and Learning* (CTL) is a learning model that emphasizes the process of full student involvement to be able to discover the material studied and relate it to real life situations so as to encourage students to be able to apply it in their lives. In other words, *Contextual Teaching and Learning* (CTL) is learning that occurs in close connection with actual experience. In the learning model *Contextual Teaching and Learning* (CTL) students are invited to find their own learning material based on student experience gained through appropriate learning activities.

Based on the concepts mentioned by the experts above, there are three things that can be understood. First, *Contextual Teaching and Learning* (CTL) emphasizes the process of student involvement in discovering material so that the learning process is oriented to students' direct experience. Students are expected not only to receive lessons, but also to go through the process of searching and finding the lesson material themselves. Second, *Contextual Teaching and Learning* (CTL) can encourage students to find connections between the material studied and real-life situations. Students are required to be able to understand the relationship between learning experiences at school and everyday life. For students, the material presented is not only functionally meaningful, it will also be firmly embedded in students' memories and will not be easily forgotten. Third, *Contextual Teaching and Learning* (CTL) encourages students to be able to apply it in life. Contextual learning not only expects students to understand the material being studied, but also how the learning material can color behavior in real life. A teacher's knowledge and ability to apply an appropriate model is very necessary, because achieving a competency cannot be separated from the implementation of an effective and efficient learning process.

Learning model *Contextual Teaching and Learning* (CTL) is in accordance with the characteristics of science learning in elementary schools. In elementary school, science learning studies nature and the phenomena that occur in it. All science study objects can be easily found in everyday life by students. Problems that occur in everyday life are often solved by applying science concepts even though most students are not aware of this. Thus, through a learning model *Contextual Teaching and Learning* (CTL) can improve science learning outcomes in elementary schools so that students can think critically and creatively.

Learning that emphasizes student activity can improve learning outcomes (Syawaluddin, et al, 2020). A similar thing was stated by Yustika, et al (2021) that learning that involves students will make students enthusiastic in participating in learning so that they can improve learning outcomes. By using a learning model *Contextual Teaching and Learning* (CTL) it is hoped that class IV students at Gugus II

Elementary School, Donggo District, Bima Regency will be able to understand more deeply and discover and be able to answer existing difficulties, especially science learning outcomes. Apart from that, this model will also help teachers link the material taught with students' real-world situations and encourage students to make connections between the knowledge they have and its application in real life.

2. RESEARCH METHOD

This type of research is experimental research using a research design with nonequivalent *control group design*. The population in this study were all fourth-grade students at Gugus II Elementary School, Donggo District, Bima Regency, consisting of SDN Inpres O'o, SDN O'o (Mpili), SDN Kamunti, SDN Inpres Kala, and SDN Manggekompo. The samples used in this research were 18 class IV students at SDN Kamunti as the control class and SDN Inpres O'o as the experimental class with 23 students.

Data collection in this research was carried out using tests, observation and documentation. Data analysis was carried out descriptively and inferentially. Descriptive analysis was carried out to describe students' understanding before and after implementing the CTL learning model. Inferential analysis is carried out to test research hypotheses where the inference results (conclusions) obtained from a sample can be generalized to the population using the t-test.

3. RESULTS AND DISCUSSION

A. Research result

1. Descriptive Analysis

a. Description of the Science Learning Model Used at SD Gugus II, Donggo District, Bima Regency

In the science learning process at Gugus II Elementary School, Donggo District, Bima Regency, the majority of teachers apply teaching models/methods using lectures that take place verbally. The lecture learning model is used together with the question-and-answer method at the end of the lesson, also interspersed or combined with the storytelling method depending on what lesson material is being presented. Apart from that, teachers also use whiteboard media to support the learning process using the lecture method. Based on the researcher's short interviews with several class IV teachers at the research elementary school, the use of the lecture method, question and answer combined with storytelling will make it easier for students to understand, absorb and feel about the events/events in the subject matter. However, on the other hand, using this lecture method makes students less likely to explore their potential. Apart from that, the learning model and method in Cluster II, Donggo District, Bima Regency is group discussion facilitated and guided by the teacher.

b. Overview of the Application of Model Learning *Contextual Teaching and Learning* (CTL) In Class IV Elementary School Group II Donggo Subdistrict, Bima Regency

Teachers' teaching activities in science learning by applying Contextual *Teaching and Learning* (CTL) obtained an average score of 93.33%. Based on the results of this analysis, it can be seen that in general the learning activities are in accordance with the established plan, but there is still one thing that has not been implemented, namely the researcher did not monitor students during group study.

Student activities before implementing the learning model *Contextual Teaching and Learning* (CTL) of 51.74% and negative activity of 48.26%. However, after implementing learning using models *Contextual Teaching and Learning* (CTL) students' positive activity increased significantly, namely 89.13% and negative activity during learning decreased to 10.87%. This shows that by implementing the learning model *Contextual Teaching and Learning* (CTL) in science learning in class IV, Gugus II, Donggo District, Bima Regency, can increase students' positive activities compared to the previous learning model implemented *Contextual Teaching and Learning* (CTL).

c. Overview of IPA Learning Outcomes Class IV Elementary School Group II Donggo Subdistrict Bima Regency

To find out the categorization of science learning outcomes for class IV students at SDN Kamunti (control class) can be seen in the following table:

Table 1. Descriptive of Control Class Science Learning Outcome Categories

No	Mark	Category	Science Learning Outcomes			
			Pretest		Posttest	
			Frequency	%	Frequency	%
1.	80 – 100	Very well	0	0	2	10
2.	66 – 79	Good	3	15	6	30
3.	56 – 65	Enough	6	30	10	50
4.	40 – 55	Not enough	11	55	2	10
5.	30 – 39	failed	0	0	0	0
		Total	20	100	20	100

Based on the descriptive data of the control class science learning outcome categories above, it can be seen that 3 people (15%) obtained scores of 66-79 in the pretest control class at SDN Kamunti Science in the good category, with 3 students (15%) getting scores of 56-65 in the fair category. 6 students (30%), and 11 students (55%) who got a score of 40-55 in the poor category. Meanwhile, for the posttest, there were 2 students (10%) who got a score of 80-100, 6 students (30%) who got a score of 66-79 in the good category, and students who got science learning results between 56- 65 with a sufficient category of 10 students (50%). There were 2 students (10%) who got scores between 40-55 in the less category. Based on these results, it can be concluded that the science learning results of class IV students at SDN Kamunti (control class) pretest were predominantly in the poor category, namely 11 students (55%). Meanwhile, the dominant posttest science learning results were in the sufficient category, namely 10 students (50%) of the 20 students studied (sample).

To find out the categorization of science learning outcomes for class IV students at SDN Inpres O'o (experimental class) can be seen in the following table:

Table 2. Descriptive of Experimental Class Science Learning Outcome Categories

No	Mark	Category	Science Learning Outcomes			
			Pretest		Posttest	
			Frequency	%	Frequency	%
1.	80 – 100	Very well	0	0	16	69,6
2.	66 – 79	Good	3	13	5	21,7
3.	56 – 65	Enough	14	60,9	2	8,7
4.	40 – 55	Not enough	6	26,1	0	0
5.	30 – 39	failed	0	0	0	0
		Total	23	100	23	100

Based on the descriptive data of the categories of experimental class science learning outcomes above, it can be seen that the experimental class science learning outcomes were before implementing the learning model *Contextual Teaching and Learning* (CTL) at SDN Inpres O'o where students who got a score of 66-79 in the good category were 3 students (13%), students who got a score of 56-65 in the fair category were 14 people (60.9%), while there were Those who got a score of 40-55 in the less category were 6 people (26.1%). Meanwhile, the experimental class science learning results after implementing the Contextual Teaching and Learning (CTL) learning model at SDN Inpres O'o, as many as 16 students (69.6%) got a score of 80-100 in the very good category. Meanwhile, there were 5 students who got a score of 66-79 in the good category (21.7%), and 2 students who got a score of 56-65 in the fair category were 2 people (8.7%). Based on these results, it can be concluded that the science learning outcomes of class IV students at SDN Inpres O'o (experimental class) before the application of the Contextual Teaching and Learning (CTL) learning model were dominantly in the sufficient category, namely 14 students (60.9%). However, after implementing the Contextual Teaching and Learning (CTL) learning model, the science learning outcomes of fourth grade students at SDN Inpres O'o (experimental class) were predominantly in the very good category, namely 16 people (69.6%) of the 23 students (sample) who participated. researched.

2. Inferential Analysis

a. Normality test

The results of the pretest data normality test in this study can be seen in the following table:

Table 3. Pretest Data Normality Test Results

Class Group	Asymp. Sig. (2-tailed)	Significant Standards	Information
Experiment	0,144	0,05	Normal
Control	0,512	0,05	Normal

Based on the data from the pretest data normality test results above, it can be seen that the Asymp value from the pretest normality test data can be determined. Sig. (2-tailed) in the experimental class was 0.144 and in the control class it was 0.512, so it was greater than the significant standard, namely 0.05. Thus, it can be concluded that the pretest data sample in this study came from a normally distributed population.

The results of calculating the normality test of posttest data on science learning results for class IV Cluster II students in Donggo District, Bima Regency can be seen in the following table:

Table 4. Pretest Data Normality Test Results

Class Group	Asymp. Sig. (2-tailed)	Significant Standards	Information
Experiment	0,140	0,05	Normal
Control	0,400	0,05	Normal

Based on the pretest data normality test data above, the output of the posttest data normality test can be seen as the Asymp value. Sig. (2-tailed) in the experimental class was 0.140 and in the control class it was 0.400, so it was greater than the significant standard, namely 0.05. Thus, it can be concluded that the posttest data sample in this study came from a normally distributed population.

b. Homogeneity test

The results of the homogeneity test calculation can be seen in the following table:

Table 5. Pretest Homogeneity Test Results
Test of Homogeneity of Variances

Science Learning Outcomes

Levene Statistic	df1	df2	Say.
2,121	1	41	,153

Based on the results of the homogeneity of variance test output in table 4.9 above, it is known that the significant value obtained is 0.153. Because the significance value is greater than 0.05, it can be concluded that the experimental class and control class students come from populations that have the same variance, or that the two classes are homogeneous.

The results of the posttest data homogeneity test in this study can be seen in the following table:

Table 6. Posttest Homogeneity Test Results
Test of Homogeneity of Variances

Science Learning Outcomes

Levene Statistic	df1	df2	Say.
1,270	1	41	,266

Based on the output results of the homogeneity of variance test using the Levene test above, the significance value obtained was 0.266. Because the significance value is greater than 0.05, it can

be concluded that the experimental class and control class students come from populations that have the same variance, or that the two classes are homogeneous.

c. Hypothesis testing

The results of the independent t-test calculation in this research can be seen in the following table:

Table 7. Hypothesis Test Results Pretest Data

Science Learning Outcomes	Mean	t_{count}	t_{table}	Say	Conclusion
Experiment	60,87	2,190	2,019	0,034	H_a accepted H_0 rejected
Control	55,75				

Based on the results of the pretest data hypothesis test above, it is known that the t $value_{count}$ of 2.190, t distribution table, t $value_{table}$ for df = 41 (attached) it is 2.019, and the significance value is 0.034 ≤ 0.05. With t $value_{count}$ (2,190) ≥ t_{table} (2.019), then according to the basis for decision making in the independent sample t-test, it can be concluded that Ha is accepted and H0 is rejected. This is also supported by the mean value of the experimental class being greater than the control class, where the mean of the experimental class is 60.87 and the mean of the control class is 55.75. This shows that the science learning results for class IV at SDN Gugus II, Donggo District, Bima Regency, experimental and control classes in the initial test were significantly different.

The results of calculations using the independent t-test posttest experimental class and control class in this research can be seen in the following table:

Table 8. Hypothesis Test Results Posttest Data

Science Learning Outcomes	Mean	t_{count}	t_{table}	Say	Conclusion
Experiment	81,30	5,344	2,019	0,000	H_a accepted H_0 rejected
Control	66,50				

Based on the data in the posttest data hypothesis test above, it is known that the t $value_{count}$ of 5.344, and t distribution table, t $value_{table}$ for df = 41 (attached) it is 2.019, and the significance value is 0.000 ≤ 0.05. With t $value_{count}$ (5,334) ≥ t_{table} (2.019), then according to the basis for decision making in the independent sample t-test, it can be concluded that Ha is accepted and H0 is rejected. This is also supported by the mean value of the experimental class being greater than the control class, where the mean of the experimental class is 81.30 and the mean of the control class is 66.50. So, it can be concluded that the results of class IV science learning at SDN Gugus II, Donggo District, Bima Regency, are based on the learning model *Contextual Teaching and Learning* (CTL) better than students who receive conventional learning. This shows that there is a significant influence between the implementation of the learning model *Contextual Teaching and Learning* (CTL) on the results of class IV science learning at SDN Gugus II, Donggo District, Bima Regency.

B. Discussion

The science learning model used by SD Gugus II, Donggo District, Bima Regency, is that the majority of teachers apply teaching methods or methods using lectures that take place verbally. When learning activities take place, teachers have never used a more innovative model, for example a cooperative learning model. This happens because teachers lack understanding of this cooperative learning model and teachers are reluctant to try new, more innovative models. Based on pre-research conducted by the research, when teachers teach using varied lecture methods, many students do not

pay attention to the teacher because learning is negative *teacher centered* (teacher-centered learning) so that student involvement in the learning process is lacking. Apart from that, the material taught is less focused, which quickly leads to boredom among students.

The above is in line with the statement by Hamid and Iriyanti (2015) that in the lecture method learning students are less involved in learning, the teacher gives more lectures while the students only listen to the teacher's lecture. Teachers also don't do a lot of questions and answers with students. If teachers do not appear prepared, knowledgeable, confident, enthusiastic and structured, students can become bored, distracted and learning will be hampered. The lecture method cannot provide students with sufficient opportunities to process and understand the information presented. The lecture method will make students believe that the teacher will tell students everything they need to know. This will eliminate the sense of responsibility regarding the student's own learning.

In general, implementing learning using the Contextual Teaching and Learning (CTL) learning model in class IV science subjects can have a good influence on students, especially in learning outcomes. After being given evaluation questions, the average learning outcomes of experimental class students received the highest average score, namely 81.30. Meanwhile, the control class got an average score of 66.50. Based on the results of observations, it is known that teachers' teaching activities in science learning by implementing Contextual Teaching and Learning (CTL) obtained an average score of 93.33%. From the results of this analysis, it can be seen that in general the learning activities are in accordance with the established plan, namely in accordance with the RPP previously prepared.

The application of the Contextual Teaching and Learning (CTL) strategy is a student learning experience that directly involves students in every learning process or can be said to be a student center. The Contextual Teaching and Learning (CTL) learning strategy can encourage students to always participate actively in learning and can also directly deepen the concepts, understanding and facts that students learn by relating them to real life. Because in essence it is the students themselves who search for and discover the concept. Thus, this proves that the Contextual Teaching and Learning (CTL) learning strategy has a big impact in improving student learning outcomes.

Based on the results of research conducted by Ridwanullah, et al (2014) which states that learning using the Contextual Teaching and Learning (CTL) learning model has a quite good influence in improving science learning outcomes in elementary schools, because the problems presented in learning are related to life. real students. Because in learning that uses the Contextual Teaching and Learning (CTL) learning model, it is more about empowering students, where students must be able to search for and explore their own understanding and knowledge of the material being taught, while the teacher only functions as a facilitator.

The research results show that the Contextual Teaching and Learning (CTL) learning model is better compared to learning that only uses conventional methods. By implementing the Contextual Teaching and Learning (CTL) learning model in the learning process, a different atmosphere can be seen from the usual one, namely students look more active and enthusiastic in participating in the learning process in class. This is in accordance with observations made by researchers during the learning process which packages the delivery of material using the Contextual Teaching and Learning (CTL) learning model. Students looked more enthusiastic in working on assignments in groups given by the researcher.

The learning that is applied is packaged in one learning model, namely the Contextual Teaching and Learning (CTL) model. In contextual (experimental) classes, students are formed into several groups to work together to solve a problem they face based on experiences they actually experience in real life. This can help make it easier for students to absorb lesson material, not just to memorize it, but also to understand it. That way, students no longer just memorize material but remember it because it is stored for the long term. Therefore, the Contextual Teaching and Learning (CTL) learning model can help students to retain knowledge in the long term based on understanding the material presented contextually. This is in line with what was expressed by Yuswita (2018:22), stating that "Contextual Teaching and Learning (CTL) emphasizes more on students who fully involve students in looking for materials and connecting them to the child's real world."

4. CONCLUSIONS AND SUGGESTIONS

The knot

Based on the results of the research and discussion previously presented in chapter IV, the following conclusions can be drawn:

1. The science learning model used by SD Gugus II, Donggo District, Bima Regency, is that the majority of teachers apply lecture and group discussion learning models.
2. Application of model learning *Contextual Teaching and Learning* (CTL) in class IV of Gugus II Elementary School, Donggo District, Bima Regency, is in accordance with the implementation of learning where the teacher's teaching activities are in accordance with the established plan and positive student activity is high when compared to the previous implementation of the learning model *Contextual Teaching and Learning* (CTL).
3. The science learning outcomes of control class students (SDN Kamunti) where the conventional learning model was applied were lower when compared to the results of the experimental class (SDN Inpres O'o) where the learning model was applied *Contextual Teaching and Learning* (CTL).
4. Learning using models *Contextual Teaching and Learning* (CTL) has a real effect on the science learning outcomes of class IV at Gugus II Elementary School, Donggo District, Bima Regency. This can be seen from the learning achievement score of the experimental class (SDN Inpres O'o) which is higher than the average score of the control class (SDN Kamunti).

Suggestion

Based on research conducted by researchers, researchers provide suggestions to various parties, including:

1. For Schools. The leadership should advise all class teachers and other subject teachers to be more innovative and creative in developing and delivering material to students that is tailored to student needs, one of which is by implementing a learning model *Contextual Teaching and Learning* (CTL).
2. For Teachers. Teachers should be able to use innovative learning models, so that students do not feel bored and do not find it difficult to understand the material so that the learning outcomes obtained can be maximized.
3. For Other Researchers. Future researchers should be able to develop the results of this research in a broader scope. The researcher hopes that future researchers can develop this research with other, more innovative variables, so that they can add insight into improving the quality of learning.

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