Improving science learning outcomes material for the healthy and unhealthy environment through a contextual learning model

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Abstract. The contextual learning model is a learning model that emphasizes the process of full student involvement to be able to find the material being studied and connect it to real-life situations to encourage students to apply it in everyday life. The purpose of this study was to improve the learning outcomes of science materials in a healthy environment and an unhealthy environment in third-grade students of SD Advent Merauke using contextual learning models. This research is a Classroom Action Research (CAR) type of collaborative research. This research was conducted in two cycles. In each cycle, there are activities of planning, implementation, observation, and reflection. The subjects of this study were Grade III students of SD Advent Merauke, totaling 19 students. Data collection techniques used are tests of student learning outcomes, observation, and documentation. The instruments used are a syllabus, lesson plan, observation sheet, and test sheet. While the data analysis used is the analysis of learning outcomes tests and analysis of student and teacher activity sheets. The results of the study showed that in the first cycle the percentage of completeness in classical learning of new students reached 31.6% and the class average reached 47.89. In the second cycle, improvements were made based on the shortcomings in the first cycle so that the shortcomings in the first cycle could be overcome. In the second cycle, the percentage of classical learning completeness students reached 94.7% and the class average reached 85.78. Based on the results of the study it can be seen that the contextual learning model is able to improve the learning outcomes of science.

1. Introduction

Natural science has a fundamental function in generating and developing critical, creative and innovative thinking skills related to how to find out about nature systematically [1,2]. Natural science is not only mastery of a collection of knowledge in the form of facts, concepts, or principles but also a process of discovery [3]. In science learning, the knowledge provided by the teacher is developed to suit the environment, the development of science that is happening and used to solve everyday problems [4,5]. Science learning is one of the core learning for elementary school students (SD), including at Merauke Elementary School. By learning science, students are expected to be able to understand concepts based on what is found in the surrounding environment which ultimately can be applied and implemented in everyday life [6,7].

In an observation that made at the Adventist Elementary School in Merauke on science subjects, researchers found the problems that occurred during the science learning process took place including
(1) when the teacher gave an explanation in front of students not paying attention, (2) when the teacher asked to answer, the answers given by students are not in accordance with what is asked, (3) there are also students who play in the classroom, (4) student care about the environment is very lacking, and (5) the learning model used is not in accordance with student needs.

Based on the results of these observations, researchers formulated a contextual learning model that was deemed appropriate to be able to overcome the problem [8,9]. The contextual learning model is learning that links learning the material to the real-life context faced by students in their daily lives, both in the context of their personal lives and their families and in the context of the social and cultural life in which he lives [1,10]. As a teacher, contextual learning helps teachers associate the material taught with the real-world situation of students into the class [4,11].

Based on the background described above, the formulation of the problem in this study is whether the science learning outcomes of the material environment of healthy and unhealthy environments can be increased through the application of contextual learning models of grade III SD Advent Merauke students. The purpose of this study was to improve the learning outcomes of science materials on the healthy and unhealthy environment in third-grade students of SD Advent Merauke through the application of contextual learning models.

2. Methods
This research is classroom action research (CAR). Classroom action research is carried out to improve student learning outcomes so that classroom action research concerns teacher efforts in the form of learning processes [12]. In this study, the researcher acted as a designer while implementing classroom learning, because one of the researchers was a teacher at SD Advent Merauke. This research was conducted at SD Advent Merauke in October 2018/2019 (odd semester). The research location is located on Jalan Sarmi, Kuda Mati, Kelurahan Kamundu, Merauke sub-district. The subjects of this study were class III SD Advent Merauke 2018/2019 academic year, with a total of 19 students consisting of 8 male students and 11 female students.

The instruments used in this study were a syllabus, learning implementation plan (RPP), observation sheet for teaching and learning activities (teachers and students), and test sheets. Data collection techniques used are tests, observations, and documentation. Tests are conducted to see student learning outcomes so that classroom action research concerns teacher efforts in the form of learning processes [12]. Observation consists of two, namely observation of teacher activity and observation of student activities. Documentation is used to record important events both carried out by teachers and students in the learning process.

This analysis is calculated using simple statistics, namely to assess formative tests. The researcher summarizes the value of the formative test with the results achieved by each student calculated by the percentage of the correct answers. Formative tests can be formulated as follows.

\[ S = \frac{R}{N} \times 100 \]

To calculate the average value of students, the researcher summarizes the value obtained by students, which is then divided by the number of students in the class to obtain the class average. The formula used is as follows.

\[ \bar{N} = \frac{\sum x}{\sum x} \times 100\% \]

There are two categories of mastery learning, individually and classically. A student has finished learning if he has achieved a score of 60, and the class is thoroughly studied if there is 80% in the class that has reached minimum completeness criteria (KKM). To calculate the percentage of learning completeness, use the following formula.
\[ Y = \frac{\sum \text{completeness student}}{\sum \text{all student}} \times 100\% \]

To find out the activities of students and teachers can be calculated using the following formula:

\[ \bar{N} = \frac{\sum x}{\sum n} \times 100\% \]

3. Results and Discussion

3.1. Results

This study aims to improve students’ learning outcomes using the contextual learning model. This Classroom Action Research was conducted at SD Advent Merauke. The study was conducted in two cycles carried out three times according to the learning schedule, the 1st meeting and 2nd meeting were conducted while the 3rd meeting was evaluated.

Data on cycle I in grade III students of SD Advent Merauke in science learning about the healthy and unhealthy environment, there are some students who have not reached the minimum completeness criteria (KKM) determined by the school, namely 60. Cycle I of the results can be seen in Table 1.

| Value  | Category | Students | Percentage |
|--------|----------|----------|------------|
| >60    | Complete | 6        | 31.6%      |
| <60    | Uncomplete | 13      | 68.4%      |
| Total  |          | 19       | 100%       |

Table 1 can be seen that students who have completed there are 6 students with a percentage of classical completeness 31.6% and an average value of 61.66. While students who have not completed there are 13 students with a percentage of classical completeness 68.4% and an average value of 41.53. Classical completeness in the first cycle has not reached the expected success indicator, namely 80% of the total number of students completed, so it is necessary to continue in cycle II.

Observation of student activities during the learning process consists of 15 aspects with the highest score for each item 4 and the lowest score for each item 1. Student activities are divided into 4 categories with qualifications namely less, sufficient, good, very good. In the first cycle of the first meeting students’ activities during learning took place the average value of the 15 observed aspects which was obtained an average value of 2.66 and included in good qualifications. For the results of teacher observation, from 20 indicators obtained an average value of 3.45 and included in very good qualifications. In the first cycle of the second meeting, the average value of the 15 aspects observed was obtained an average value of 2.64 and entered into good qualifications and the results of teacher observations from the 20 indicators assessed obtained an average value of 3.61 and in very qualifications well.

Based on the results of reflection in the first cycle, there are some shortcomings that occur and improvements will be made in the second cycle. The weaknesses of the implementation of the first cycle are as follows: First, when the learning process takes place, the teacher has provided an opportunity for all students to ask questions related to the subject matter, but there are still many students who are still shy and do not dare to express their opinions. Second, when discussing groups of students have not cooperated well, students rely more on smarter friends and other friends talk to close friends. Third, students are still shy and afraid when appointed by the teacher to present the results of their group work in front of the class. Fourth, some students still have difficulty reading so that when working on test questions takes a longer time.
From these problems, the plan for improvement will be carried out in the second cycle. The improvement plan is: (1) the teacher must provide encouragement or motivation for students to dare to ask if students do not understand the learning material, (2) the division of groups is determined by the teacher based on mixing smart students grouped with less intelligent students, so students are clever can teach less intelligent friends, and (3) teachers provide wider opportunities for students to actively participate in solving problems.

Based on the results of the implementation of the first cycle that is not included in the indicator of success, then this study continued in the second cycle. The results of the implementation of learning in the second cycle obtained the classical completeness percentage of students in Table 2 below:

| Value | Category | Students | Percentage |
|-------|----------|----------|------------|
| >60   | Complete | 18       | 94.7%      |
| <60   | Uncomplete | 1       | 0.53%      |
| **Total** |          | **19**   | **100%**   |

Based on Table 2 above shows that students who have completed there are 18 students with a percentage of classical completeness 94.7%, the average value is 88.33. While students who have not finished 1 student with a classical completeness percentage of 0.53 an average value of 40. Based on the table above it can be concluded that in the second cycle it was said to be successful because it had reached the expected indicators of success.

The activities of students in the second cycle of the meeting I experienced an increase in every aspect for 2 meetings. Based on the observations of student activities above the average value of 15 observed aspects, the average score of 3.26 and the score in the qualifications was very good. While the results of teacher observations from 20 indicators assessed obtained an average value was 3.75 and in very good qualifications. Student Activity Cycle II The second meeting obtained an average value of 3.42 and in very good qualifications. While the results of teacher observations in the second cycle of the meeting 2 of the 18 indicators that were assessed obtained an average value of 3.77 and in the very good category.

Based on the results of the assessments in cycles I and II can be illustrated in the following Figure 1.

![Figure 1. Completeness of classical student learning outcomes](image)

In the first cycle, the percentage of classical completeness of students who have completed is 31.6%. While in the second cycle the percentage of classical completeness of students who have completed is 94.7%. So that the second cycle has been said to have succeeded in reaching 80% of the total number of students and not followed by research into the next cycle.
Based on Figure 2 the average completeness of student learning outcomes in the first cycle is 47.89, while the average completeness of student learning outcomes in the second cycle is 85.78.

Based on Figure 3 the presentation value of observations of student activities is 66.66 in the first cycle of meeting 1 with an average of 2.66, the presentation value of student observations is 66.07 in the first cycle of meeting 2 with an average value of 2.64. The presentation value of the observation in the second cycle of meeting 1 was 81.66 with an average value of 3.26, while in the second cycle of meeting 2 the percentage value of the observation of student activities was 85.71 with an average value of 3.42.

Based on Figure 4 the presentation value of observations of teacher activities is 86.25 in the first cycle of meeting 1 with an average of 90.27, the presentation value of teacher observation is 93.75 in the first cycle of meeting 2 with an average value of 94.44.
Based on Figure 4, it can be seen above that the presentation value of teacher activity observations amounted to 86.25 in the first cycle of meeting 1, the first cycle of meeting 2 presentation results of observations of teacher activities amounted to 90.27. The teacher is 93.75, in the second cycle of the meeting 2 the presentation value of the results of the observation of teacher activities was 94.44.

Reflections on the second cycle, namely classical completeness obtained reached the expected success indicator, which is 80%, so the research is not continued to the next cycle. In cycle II students focus and enthusiasm in the learning process takes place, it can be directed to pay attention to what material is learned and pay attention when someone is speaking or explaining in front of the class, so learning in cycle II is very good and student learning outcomes are improved when given cycle evaluation tests II.

From the above, it can be said that the research in the second cycle has reached the indicator of success. Classical completeness reaches more than 80% of the number of students who have achieved the KKM that has been set, as well as an increase in student activity from cycle I to cycle II, so this study was stopped in cycle II and does not need to be continued in the next cycle.

3.2. Discussion

Classroom action research (PTK) using the Contextual learning model has been able to improve the learning outcomes of science materials in healthy environment and unhealthy environment. This is indicated by the value of the test results in the first cycle where the percentage of completeness was 31.6% or 6 students who had reached KKM, while 13 students or 68.4% had not yet reached KKM. In the second cycle there was an increase in student learning outcomes, the percentage of completeness as much as 94.7% or 18 students had reached the specified KKM, and 1 student or 0.53% had not reached KKM.

Based on the data above, the contextual learning model is proven to be able to improve the learning outcomes of science in Grade III students of Adventist SD Merauke because the results of the research in the second cycle have reached a predetermined indicator of success of 80%.

This is in line with some research and expert opinion that suggests that contextual (CTL) is a learning strategy that emphasizes the process of full student involvement to be able to find the material being learned and connect it to real life situations so as to encourage students to apply it in their lives [13–16].

4. Conclusion

4.1. Conclusion

Based on the results of the study it can be concluded that the contextual learning model can improve the learning outcomes of Grade III students of Advent Merauke Elementary School in science learning materials on a healthy environment and unhealthy environment. This can be seen from the results of the average value in the first cycle of 61.66 and the second cycle of 88.33 The percentage of classical completeness in the first cycle was 31.6% or as many as 6 students had completed the KKM and in the second cycle was 94.7 % or as many as 18 students have completed KKM. The results of observation of teacher activity in the first cycle of meeting 1 with an average value of 3.45, the percentage of classical completeness 86.25%. The first cycle of meeting 2 with an average value of 3.61, the percentage of classical completeness was 90.27%. While in the second cycle of meeting 1 with an average value of 3.75, the percentage of classical completeness was 93.75%, the second cycle of meeting 2 with an average value of 3.77, the percentage of completeness 94.44%.

The results of observations on the activities of students in the first cycle of meeting 1 with an average value of 2.66, the percentage of classical completeness 66.66%, Cycle I meeting 2 with an average value of 2.64, the percentage of classical completeness 66.07. While the second cycle of meeting 1 an average value of 3.26, the percentage of learning completeness was 81.66%, and the second cycle of meeting 2 with an average value of 3.42, the percentage of classical completeness was 85.71%
4.2. Suggestion
From the results of this study, there are several suggestions from researchers that need to be considered especially in general science learning, namely: First, for students. It is expected that students can apply mastery of science learning material that has been owned in everyday life. Second, for the teacher. It is better if the teacher learns to apply a learning model that includes students so that students can experience learning themselves so that student learning becomes fun. Third, for the next researcher, the next researcher who wants to conduct the same research should not only limit efforts to improve student learning outcomes, but also other variables that are improved in other fields as well. Fourth, for the principal. The principal is expected to be able to provide policies for the procurement of books relating to various cooperative learning models so that references can be used for teachers in applying the learning model in the classroom.

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