The effect of environmental learning models on science process skills and learning outcomes of students in smp negeri 10 Manado

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Abstract
This study aims to determine the effect of the environmental learning model on science process skills and student learning outcomes on the material interaction of living things with their environment in SMP Negeri 10 Manado. The instrument used was the observation sheet and learning achievement test. Data analysis technique used normality test with liliefors test followed by hypothesis testing using multivariate analysis of variance or manova test. Based on the data the results obtained indicate an increase in average science process skills and student learning outcomes. The average learning outcomes of the experimental class taught by the environmental learning model have increased significantly with an average value of 77.87 greater than the average value of the control class that is 66.00. While the average value of science process skills for the experimental class was 77.30 greater than the average value of the control class 51.10. Hypothesis testing uses the multivariate analysis of variance analysis or the manova test that the significance value for Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root = 0.000. So the significance value is smaller than the significance level of 0.05 or 0.00 <0.05. Thus it can be concluded that there is an influence of environmental learning models on science process skills and student learning outcomes.

Keywords: environmental learning model, science process skills, student learning outcomes

Introduction
The development of science concepts with daily life will make the learning process of science more active, real, and more interesting. The same thing in the 2013 science curriculum learning process that is held interactively, fun, challenging, and students actively participate. Student life is closely related to the environment in which he lives and interacts with the natural surroundings. Many problems and facts that really need to be raised in learning. According to Saptono (in Febryanti, 2014), a person will be more effective in the learning process if the cognitive is actively undergoing reconstruction, both when colliding with a phenomenon and social conditions [1]. The process of science or the process of scientific activity begins when someone observes something. Something is observed because it attracts attention, maybe raising questions or problems. This problem needs to be solved through a process called the scientific method to gain knowledge called science.

Emphasis on learning activities that are associated with the environment around the lives of students and the real world, in addition to being able to open up diverse thinking perspectives, students can also learn various kinds of concepts and ways to relate them to real-life problems. By exploring the environment, a person will interact with the facts in the environment to find experiences and something that raises questions or problems. With the existence of human problems will conduct thinking activities to find solutions to problems. In solving problems not based on feelings but more scientific fame (Suriasumantri, 2000) [2]. To assist students in solving problems in learning, there needs to be availability of teaching materials that are

interesting and easy for students to understand.

The results of preliminary observations at SMP Negeri 10 Manado indicate that learning is still ineffective. This can be seen from the fact that there are still many students who are less active in learning and learning that is still teacher-centered, whereas according to the 2013 curriculum students have to participate more in learning (student center). The teacher has also designed learning to build science process skills (KPS) in students but only in aspects of skills such as observing and communicating. Therefore, for other process skills need to be developed such as asking questions, classifying, proposing hypotheses, conducting experiments, interpreting, and the ability to communicate data. In addition to the science process skills of students who are still low, student learning outcomes are also still low. Obtained from the student semester grades it is known that of 30 students with KKM 70 only 40% with a total of 12 students completing. While students who received grades in the unfinished category reached 60% or 18 students.

Meanwhile, innovations in changing learning variations that emphasize theory and practice are still less than optimal, especially for science subjects. The implementation of learning is less directing students to more concrete things so that the material obtained is still abstract for students. Seeing these problems, to develop science process skills and learning outcomes, researchers used a model of environmental learning. Environmental learning model is learning that utilizes the environment as a means and source of learning, so as to provide meaningful experiences to students through direct experience related to the environment around the school.

One learning model developed in the world of education is

the environmental learning model. According to Wayan (2008), that the environmental learning model is a learning that in its implementation requires teachers to try to increase student involvement through the utilization of the environment as a learning resource [3]. Environmental learning model is one alternative learning that must be applied in the world of education today. Bearing in mind that learning is often oriented towards mastering subject matter, so it is less able to raise the quality of our education, both in terms of results and the learning process. Through the environment as a learning resource is expected to provide a different and pleasant atmosphere, and provide new experiences for students. Through the environment, students are expected to be able to learn from what they see, what they feel, and what they find in the environment, so that learning will be more meaningful. Understanding of a concept through learning in the environment will have the property to last longer. An environment based learning model is programmed to directly involve students in learning that links between concepts and principles learned, so students will understand the process and learning outcomes in accordance with the facts and events experienced, not just information from the teacher.

2. Research Methods

The study was conducted in the even semester of the 2019/2020 Academic Year in February 2020 at SMP Negeri 10 Manado. The research method used is an experimental method. The research design in this study, namely Quasi Experimental. This form of experimental design is the development of True experimental design. The study population was all VII grade students of SMP Negeri 10 Manado, totaling 315 students divided into 10 classes. The sample in this study were students of class VII-6 totaling 30 students as the experimental class and class VII-7 totaling 30 students as the control class. Data collection techniques in this study used observation of students' science process skills and student learning outcomes tests. Assessment through science process skills is carried out in the form of observation instruments. Observations in this assessment are made directly or indirectly. During the process of science learning activities carried out, the teacher conducts an assessment by observing student behavior directly in showing the ability of the science process skills possessed. Student learning outcomes are measured using a test instrument student learning outcomes that have been tested for validity and reliability. The process of analyzing the validity and reliability of the data uses SPSS version 22. The data obtained were analyzed using the normality test, homogeneity test, hypothesis testing, and science process skills. The normality test used is the Saphiro-Wilk test at a significance level of 0.05. This test is used to determine whether the sample used in this study came from populations that were normally distributed or not. The statistical test used to test the similarity of variance between the two study groups is the levene test at the 0.05 significance level. The Manova test is used to measure the effect of categorical independent variables on several dependent variables at once with quantitative data scale.

This analysis is also called multivariate anova. The science process skills instrument in this research was in the form of an observation of science process skills. In the analysis technique the observed observation sheet is an aspect of science process skills with a Likert scale. Observation sheet is used to find out the science process skills during the learning process.

3. Result and Discussion

The average value of experimental class science process skills using the environmental learning model is higher than the average value of the control class science process skills that uses conventional learning on the subject of the interaction of living things and their environment. The learning process is done by giving worksheets and directing students to observe, ask questions, propose hypotheses, carry out experiments, interpret data, and communicate findings in the environment to the teacher and classmates related to the material interaction of living things and their environment. At the stages of the field practicum process, the teacher as an observer is assisted by several other teacher friends, watching closely on each student to measure the science process skills using an observation sheet of science process skills from students.

Through the research that has been done obtained learning outcomes and process skills in each class both the experimental class and the control class have increased that the average value of science process skills for the experimental class is 77.30 greater than the average value of the control class 51, 10 (Figure 1). From the results of testing the first hypothesis shows that the data from the science process skills gives an F value of 95.99 with a significance of 0.000. This shows that the significance value is smaller than the significance level of 0.05 or 0.000 <0.05, so that the decision H_0 is rejected (Table 1). Thus it can be said that there is an influence of the environmental learning model on the science process skills of students.
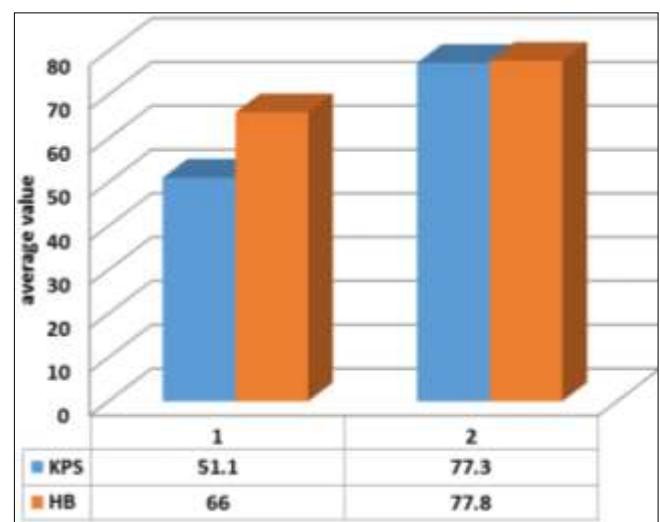
Fig 1: Average Diagram of Science Process Skill Values and Learning Outcomes

Table 1: Results of the Science Process Skill Hypothesis Test

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Nilai_ KPS	10296.600[a]	1	10296.600	95.998	.000
	Nilai_ HB	2112.267[b]	1	2112.267	20.866	.000

Intercept	Nilai_ KPS	247298.400	1	247298.400	2305.627	.000
	Nilai_ HB	310464.267	1	310464.267	3066.853	.000
Class	Nilai_ KPS	10296.600	1	10296.600	95.998	.000
	Nilai_ HB	2112.267	1	2112.267	20.866	.000
Error	Nilai_ KPS	6221.000	58	107.259		
	Nilai_ HB	5871.467	58	101.232		
Total	Nilai_ KPS	263816.000	60			
	Nilai_ HB	318448.000	60			
Corrected Total	Nilai_ KPS	16517.600	59			
	Nilai_ HB	7983.733	59			

a. R Squared =.623 (Adjusted R Squared =.617) b. R Squared =.265 (Adjusted R Squared =.252)

The difference in the average results of the science process skills of students for the two classes, due to the environmental learning model that is used with the aim that students more easily interact with the lesson material that has been prepared and adapted to the learning model. Learning materials presented to students are prepared by involving the surrounding environment. That is, learning can be done not only in the classroom, but also outside the classroom with the aim that students are more comfortable and active in the learning process. This environment-based learning model applies a game system and learning outside the classroom. Some things that must be considered in the environmental learning model are the content and learning procedures must be in accordance with the learning environment, the knowledge provided must provide a way out in response to the environment. This agrees with previous researchers-researchers who stated that the model of environmental learning or learning that involves the environment can increase the activity, motivation, and science process skills of students. Research conducted by Mia in 2012 with the title research on the application of environmental-based learning models in an effort to improve the science process skills of Metro High School students. Based on the results of his research that the

application of environment-based learning models can improve the science process skills of even X2 grade students of SMA Negeri 2 Metro in the Academic Year 2011/2012 on biodiversity material, which is shown by increasing the percentage of science process skill activities that support the learning process.

Based on the data the value of student learning outcomes obtained that the average value of experimental class learning outcomes using the environmental learning model is higher than the average learning outcomes of the control class that uses conventional learning on the material interaction of living things and their environment. Through research that has been done, the average learning outcomes of the experimental class taught by the environmental learning model have increased significantly with an average value of 77.87 greater than the average value of the control class that is 66.00. From the results of testing the second hypothesis shows that student learning outcomes data gives an F value of 20.866 with a significance of 0,000 (Table 2). This shows that the significance value is smaller than the significance level of 0.05 or 0.000 <0.05, so the decision H0 is rejected. Thus it can be said that there is an influence of the environmental learning model on student learning outcomes.

Table 2: Hypothesis Test Results Student Learning Outcomes

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Nilai_ KPS	10296.600[a]	1	10296.600	95.998	.000
	Nilai_ HB	2112.267[b]	1	2112.267	20.866	.000
Intercept	Nilai_ KPS	247298.400	1	247298.400	2305.627	.000
	Nilai_ HB	310464.267	1	310464.267	3066.853	.000
Class	Nilai_ KPS	10296.600	1	10296.600	95.998	.000
	Nilai_ HB	2112.267	1	2112.267	20.866	.000
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a.	R Squared =.623 (Adjusted R Squared =.617) b. R Squared =.265 (Adjusted R Squared =.252)

The difference in the average learning outcomes of the two classes is due to the experimental class being taught with the environmental learning model students better understand the content of the material because it involves students actively in environmental-based learning, as revealed by Ali (in Mustapa, 2013) which states that, "the model environmental learning is a learning model that emphasizes student experience in relation to the natural environment, so students can easily understand the contents of the material delivered"[4]. The environmental learning model is an environment-based learning model that was developed so that students gain more experience related to the

surrounding environment. Research on environmental learning models or learning that involves the environment, has previously been carried out by several previous researchers who examined the influence of environmental learning models. In some of the studies mentioned environmental learning models or learning that involves the environment affect student learning outcomes. Haryaningtyas research in 2016 with the research title "Improving science learning achievement and environmental care characters through environmental learning models in 7c grade students of SMPN 11 Madiun 2015/2016 academic year". Based on an analysis of

theoretical studies and some research that has been done by several researchers, the writer can explain that the environmental learning model can be used as an alternative in learning activities in schools. The use of the environment allows for a more meaningful learning process. Besides being able to attract the attention of students, environmental learning can also increase the activity, motivation, and learning achievement of students. Research conducted by Maulana in 2015 with the research title "Environmental-based learning model to raise awareness in saving the environment". The environmental learning model influences the results of students in grades VII-5 of SMP Negeri 10 Manadi. This is caused by several factors, namely the implementation of using environmental learning models more attractive to students because it involves the school environment as a source of learning so that learning activities become better and will have an impact on student learning outcomes. In addition, the use of the environment allows for a more meaningful learning process so that the contents of the subject matter will be more easily remembered by students.

The third hypothesis testing uses the manova test which is a statistical test used to measure the effect of categorical scale independent variables on a number of dependent variables as well as the scale of quantitative data. This analysis is also called multivariate anova. Multivariate ANOVA stands for multivariate analysis of variance, which means a multivariate form of analysis of variance (ANOVA). The form of multivariate means that there is more than one dependent variable. This test measures the effect of the independent variable, the environmental learning model on several dependent variables simultaneously or simultaneously, namely the science process skills and student learning outcomes.

Table 3: Manova Test Results

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.987	2244.241[b]	2.000	57.000	.000
	Wilks' Lambda	.013	2244.241[b]	2.000	57.000	.000
	Hotelling's Trace	78.745	2244.241[b]	2.000	57.000	.000
	Roy's Largest Root	78.745	2244.241[b]	2.000	57.000	.000
Class	Pillai's Trace	.642	51.194[b]	2.000	57.000	.000
	Wilks' Lambda	.358	51.194[b]	2.000	57.000	.000
	Hotelling's Trace	1.796	51.194[b]	2.000	57.000	.000
	Roy's Largest Root	1.796	51.194[b]	2.000	57.000	.000

a. Design: Intercept + Kelas b. Exact statistic

Based on the above results it can be seen that the significance value for Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root = 0,000 (Table 3). So, the significance value is smaller than the significance level of 0.05 or 0.00 <0.05, so the decision H0 is rejected. Thus it can be said that there is an influence of environmental learning models on science process skills and student learning outcomes. The implementation of learning using environmental learning models provides a positive interaction effect on improving the science process skills of students and student learning outcomes. This positive interaction occurs due to several factors, namely by learning in an environment that can overcome boredom in student learning, students will be faced with a dynamic environment that is different from a narrow and limited classroom environment. In addition, it provides a varied learning atmosphere so that it can enhance student enthusiasm for learning and care by students towards the environment, as well as provide sufficient space for students to explore knowledge with more tangible learning experiences. These things are if able to provide encouragement to students so that increased process skills and student learning outcomes.

4. Conclusion
1. There is an influence of the environmental learning model on the process skills of students on the material interaction of living things with their environment in SMP Negeri 10 Manado.
2. There is an influence of the environmental learning model on student learning outcomes in the material interaction of living things with their environment in SMP Negeri 10 Manado.
3. There is an interaction of environmental learning models on the process skills and student learning outcomes in the material interaction of living things with the environment in SMP Negeri 10 Manado.

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