

THE EFFECT OF NATURAL
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BASEDSETS (SCIENCE,
ENVIRONMENT,
TECHNOLOGY, AND SOCIETY)
TOINCREASE OF
ENVIRONMENTAL
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THE EFFECT OF NATURAL SCIENCE LEARNING MODEL BASEDSETS (SCIENCE, ENVIRONMENT, TECHNOLOGY, AND SOCIETY) TOINCREASE OF ENVIRONMENTAL KNOWLEDGE OFTHE STUDENTS AT KENDARI ISLAMIC JUNIOR HIGH SCHOOL

Abdul Kadir, Samrin, Marniati Kadir and Gufran Darma Dirawan

The purpose of this research was to determine: (1) differences in the environmental knowledge of students before being given the treatment of learning, (2) differences in the environmental knowledge of students before and after of learning treatment, and (3) the effect of science learning model in SETS concept to increase environmental knowledge of the students at KendariIslamic Junior High School. This research was conducted at Islamic Junior High School during three months enrolled in Academic Year of 2014/2015. This research is experimental with pretest-posttest control group design. The research population was all students of class VII consists of 9 (nine) class. The research sample determined by random cluster sampling technique, namely by choosing two classes to the needs of research, each class VII. 2 with the number of students 34 people as an experimental class, and class VII. 5 as many as 31 people as a control group. Other research instruments used were validity knowledge test and reliability. Data analysis technique used t-test at a significance level of 5% (after fulfilling the requirements of normality and homogeneity test). The result of this research is obtained that: (1) There is no significant difference in the environmental knowledge of students before being given treatment SETS learning model and conventional, (2) SETS learning model have a significant influence on the increase of the environmental knowledge of students, (3) There are significant differences of environmental knowledge of students after given treatment SETS learning model and conventional. The level of environmental knowledge of the students using model SETS higher than students who use the conventional model at KendariIslamic Junior High School.

Keywords: Learning Model SETS and Environmental Knowledge of Students

Introduction

Developments in science and technology are two things that can not be separated from human life. Almost all aspects of human life today have been touched by technology products, which is the application of scientific concepts. Science and technology is a lot of a negative impact on human life, so that school learning should be linked directly with the existing technology in the surrounding environment of students.

Learning science emphasizes by providing direct experience to develop competencies that learners who are able to learn and understanding about

Address for communication: Abdul Kadir, Islamic State Institute of Kendari, E-mail: abdul_kadir@yahoo.co.id, Samrin, Islamic State Institute of Kendari, Marniati Kadir, Islamic State Institute of Samarinda and Gufran Darma Dirawan, Makassar State University, E-mail: gufrandarma@yahoo.com

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Address for communication: **Abdul Kadir**, Islamic State Institute of Kendari, *E-mail:* abdir_edu@yahoo.co.id, **Samrin**, Islamic State Institute of Kendari, **Marniati Kadir**, Islamic State Institute of Samarinda and **Gufran Darma Dirawan**, Makassar State University, *E-mail:* gufrandarma@yahoo.com

naturescientific. Science education geared weeks to figure it out and doing so can help learners to gain a deeper understanding of the nature around (Winataputa, 2002). Understanding of science concepts and processes useful for learners to be able to respond to local issues, social, economic, environmental and ethical, critically assess scientific developments in the field of science and technology and its impact (Kemendiknas, 2011).

Current conditions, learning natural science in Islamic Junior High School does not refer to the preparation of learners to have the basic knowledge required. Most science teachers in teaching only give the information contained in the textbooks, even though the text book seems more likely to contain abstract information. Rarely textbook that emphasizes discussion useful and important information for human life in general. The situation is further exacerbated by the application of learning methods that do not involve the participation of students and less treated as a subject of study, but still more are treated as objects of teaching. In addition, learning science in school, by most learners found difficult science subjects. It is clear from the attitude of students in following the lessons tend to be passive, bored, scared, not even the tasks learning.

In relation with the results of the initial identification of the authors, that the learning outcomes of students of class VII in natural science subjects at Kendari Islamic Junior High School has an average of 68.32. This indicates that the results of learning science have not reached the minimum completeness criteria as determined (70.00), meaning that the results of learning science is still relatively low, so it is necessary to do a concrete action or treatment to address the lack of knowledge of environmental caring attitude of students.

Based on the above conditions, the teachers are required to make improvements and to choose the approach or model of learning that can improve learning outcomes of students. The approach to learning is a concept or procedure used in discussing a teaching material to achieve a learning goal. So that the learning approach means learning reference seeking to improve the ability of cognitive, affective and psychomotor learners in processing the material in order to reach learning objectives. Thus the picture above shows how important an effort to find alternative to improve the quality of learning in the classroom. One of the efforts to implement the learning is to apply the model of student-centered learning.

Based on the condition learning science at the top, then the learning model that is expected to increase the knowledge of students are concerned about the environment participant is model based learning environment, namely; learning model Environment Science Technology Society (SETS). SETS learning model that combines thought STS (Science, Technology and Society) and EE (Environment Education) by giving it a new philosophy in it (Benadja, 2002). SETS learning model has a philosophical foundation to bring of students to have an open-minded towards science, environment, technology, and society (society)

as an integral and inseparable (Woolnough, 1991). The learning objectives SETS help students to know the science and the development and how development can affect environmental science, technology and society.

Based on the description above, it is necessary to do a scientific research in the form of research to explore in depth about the model of science teaching based SETS the classroom setting through experimental research in the hope these efforts can provide positive solutions to improve understanding of the concept of science to the level of knowledge and caring to environmental become better students. The general objective of this research was to determine the effect of in concept science learning model SETS towards increasing the knowledge environmental of students at Kendari Islamic Junior High School.

Research Methods

This research is a quantitative experimental with form Pretest-Posttest Control Group Design (Suwanda, 2011). Population, this research is all students of class VII, amounting to 338 people at Kendari Islamic Junior High School during three months enrolled in Academic Year 2014/2015. While sampling with random cluster sampling technique means to determine grade class with a random sample homogeneity consideration, namely 1 (one) class for the experiment (class VII-2) by the number of students 34 and 1 (one) class for controls (classes VII-5) the number of 31 people. Data were collected using instruments such as multiple choice knowledge test about the concept of the environmental impact for the life of the first tested for validity and reliability. Data analysis technique used is descriptive and inferential statistical analysis. Inferential analysis begins with the test requirements analysis, namely; Kolmogorov-Smirnov test for normality and homogeneity test Test; Levene's Test, subsequent to testing hypothesis used T-test (Riduan and Sunarto, 2012).

Research Results

Description Data Research

Descriptive analysis of data of environmental knowledge students before being given treatment can be seen on the histogram graph below.

Graph 1 above shows a comparison between the level of environmental knowledge students. The data collected by the test instrument through pretest knowledge about the impact of pollution for life before the intervention (treatment) application of science-based learning model SETS. The level of environmental knowledge students categorized very low frequencies acquired 6.15% with 4 out of a total of 65 respondents, obtained 49.23% lower categories with a frequency of 32 respondents, the categories being obtained 32.31% with a frequency of 21 respondents, and obtained high category 12.31% with a frequency of 8

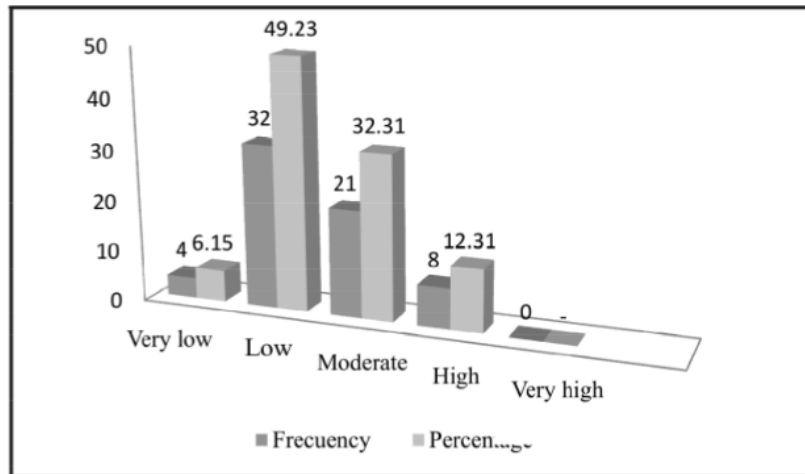


Figure 1: Graph Distribution Environmental Knowledge Value Before Treatment

respondents. Thus the level of environmental knowledge students before being given treatment SETS based model of learning science in general is low category.

The results of the descriptive analysis of data of environmental knowledge of students after being given treatment can be seen on the histogram graph below.

Graph 2 above shows a comparison between the level of environmental knowledge of students, the data collected by the test instrument through posttest

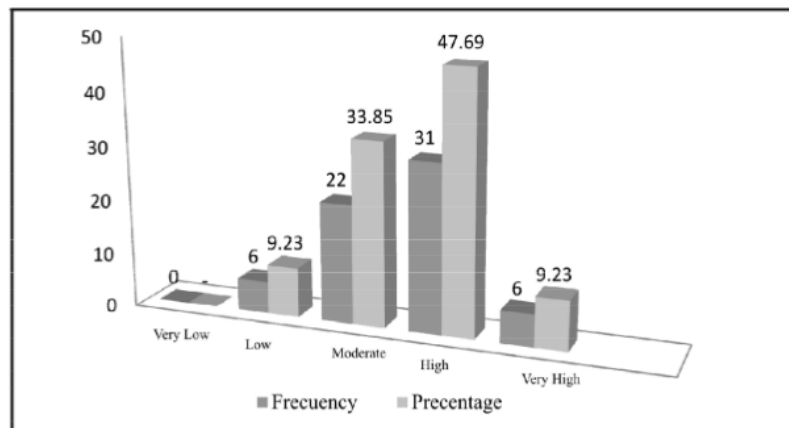


Figure 2: Graph Distribution Environmental Knowledge Value After Treatment

knowledge about the impact of pollution for life after treatment is given science learning models based SETS. The level of environmental knowledge learners are low category gained 9.23% with a frequency of 6 of the total 65 respondents, the categories being obtained 33.85% with a frequency of 22 respondents, higher category gained 47.69% with a frequency of 31 respondents, and the very high category is obtained 9.23% with a frequency of 6 respondents. Thus the level of environmental knowledge of students before being given treatment increased after the treatment is given science learning models based SETS at Kendari Islamic Junior High School.

Test Requirements Analysis

Before testing the hypothesis, first tested the requirements analysis; test for normality using the Kolmogorov-Smirnov (KS) test to test for normality and homogeneity of variance Levene's statistic to test with the help of Statistical Product and Service Solutions (SPSS version 21), as follows:

Normality Test

TABLE 1: SUMMARY OF RESEARCH DATA NORMALITY TEST RESULTS

Class	Group Data	Sig (p)	A	Conclusion
Experiment	Pretest Values of Knowledge (μ_{E1})	0,144	$\alpha = 0,05$	Normal
	Posttest Value of knowledge (μ_{E2})	0,081		Normal
Control	Pretest Values of Knowledge (μ_{K1})	0,200		Normal
	Posttest Value of knowledge (μ_{K2})	0,191		Normal

Criteria

- If the probability (p) > 0.05, then H_0 is accepted and concluded that the residual value (error) normal spread. If the probability (p) < 0.05 then H_0 is rejected and it was concluded that the residual value (error) is not normal spread.

Homogeneity of Variance Test

TABLE 2: SUMMARY OF RESULTS OF TESTING HOMOGENEITY VARIANTS TEST OF HOMOGENEITY OF VARIANCES

Variance group		Levene Statistic	df1	df2	Sig. (p)	Conclusion
Value of Knowledge	1 μ_{E1} & μ_{K1}	0,171	1	63	0,681	homogeneous
	2 μ_{E1} & μ_{E2}	0,837	1	66	0,346	homogeneous
	3 μ_{E2} & μ_{K2}	0,101	1	63	0,751	homogeneous

Criteria

If the value of $p > \alpha = 0.05$ means that data is spread homogeneously and vice versa if $p < \alpha = 0.05 =$ Data not homogeneous spread

Hypothesis Testing

Testing T-test value of the environmental knowledge of the students at Kendari Islamic Junior High School by the sample group is to determine which group a bigger influence. Output used to test the hypothesis that the variance t-test for unpaired data is Independent Samples Test (Hypothesis 1 and 3) and Paired Samples Test to test the variance of the data pairs (Hypothesis 2). Summary T-test calculation results for each group of samples can be seen in the following table.

TABLE 3: SUMMARY OF HYPOTHESIS TESTING (T-TEST)

	Group Compared		T-test	T-table	Sig (ρ)	?	Information
Value of Knowledge	1	μ_{E-1} & μ_{K-1}	0,144	2,000	0,886	0,05	H_0 is accepted
	2	μ_{E-1} & μ_{E-2}	24,437	2,042	0,000		H_0 is rejected
	3	μ_{E-2} & μ_{K-2}	2,805	2,000	0,007		H_0 is rejected

Criteria

Significance level (α) = 0,05

1. If $T_{-test} < T_{-table}$, then H_0 is accepted, and if $T_{-test} > T_{-table}$, then H_0 is rejected
2. If $sig(\rho) > ? = 0,05$, then H_0 is accepted and if $sig(\rho) < ? = 0,05$, then H_0 is rejected

Based on the summary of the results of T-test in Table 3 above, it can be seen the results of hypothesis testing as follows:

Hypothesis 1: The average value of the environmental knowledge of students in the experimental class and control class before being given treatment is a normal distribution and homogeneous, then the hypothesis testing used a mean test (T-test) independent test. The hypothesis testing results obtained T_{-test} value = 0,144 < T_{-table} = 2,000, and $sig(?) = 0,886 > \alpha = 0,05$, then H_0 is accepted, meaning that there is no difference in the average value of the environmental knowledge of students in the experimental class and control class before being given treatment. Thus it can be stated that before students are given treatment SETS learning models and conventional statistically average value of the initial knowledge on the concept of the environmental impact for the life of the experimental class and control class is the same.

Hypothesis 2: The average value of the knowledge of students before and after the treatment is a normal distribution and homogeneous, then test the hypothesis used t-test for unpaired variance (Paired Samples Test). The hypothesis testing results obtained $T_{-test} = 24,437 > T_{-table} = 2,042$, and $sig(?) = 0,000 < ? = 0,05$, then H_0 is rejected, meaning that statistically there is a significant difference between the average value of the environmental knowledge of students before the model application after learning science based SETS on the concept of environmental pollution for life. Environmental knowledge possessed learners before treatment increased after a given treatment.

Hypothesis 3: The average value of the environmental knowledge of students after given treatment is a normal distribution and homogeneous, then the hypothesis testing used a mean test (T-test) independent test. The hypothesis testing results obtained $T_{\text{test}} = 2,805 > T_{\text{table}} = 2,000$, and $\text{sig. } (?) = 0.007 < \alpha = 0.05$, then H_0 rejected, meaning that there are differences in the average value of the knowledge of students in the experimental class and control class after a given treatment. Thus statistically the average value of the environmental knowledge of students on the concept of the impact of pollution for life using a learning sciencebased SETS model better than learners who use conventional learning models.

Discussion

The difference in the environmental knowledge of students before being given the treatment in the experimental class and the control class has an average value that is relatively the same. Similarly, from the results of testing the hypothesis, that $T_{\text{test}} \text{ value} = 0,144 < T_{\text{table}} = 2,042$, and the probability value (?) $\text{Sig.} = 0,886 > \alpha = 0.05$, meaning that there is no significant difference of environmental knowledge of students before being given treatment learning SETS models and conventional.

Based on the findings above it is known that the environmental knowledge of students before being given learning material in both sample groups have little knowledge. This indicates that prior to the treatment given to the two groups of learners have characteristics similar knowledge. This situation according Arikunto opinion (2005), that one of the requirements is to try an experimental study two groups of respondents in the same condition.

The research findings also supported by Woofolk (1993: 239), that knowledge as an end result of learning activities, more than the end product of previous learning but also serve as guidelines for new learning. The statement indicates that a person acquires knowledge through learning activities, and the knowledge that has been owned by someone guide you in learning new knowledge. Thus the level of environmental knowledge possessed students before being given the treatment in the experimental class and a control class is in general tend to be similar.

Learning science based SETS Model have a significant influence on the improvement of the environmental knowledge of the students at Kendari Islamic Junior High School. This fits the hypothesis testing results mean value of knowledge before and after treatment, obtained $t_{\text{test}} \text{ value} = 24,437 > t_{\text{table}} = 2,000$, and $\text{sig. } (?) = 0.000 < \alpha = 0.05$, then H_0 is rejected, meaning that there are significant differences mean knowledge score students before and after treatment, in this case the students increased knowledge significantly after being given treatment learning SETS model at Kendari Islamic Junior High School.

Based on the field observation reveal that the environmental knowledge students have increased after the treatment given SETS learning model. It can be seen from the estimated average values obtained, indicating that the environmental knowledge

students have increased after a given treatment. This fact is in accordance with the study of the theory that the learning model that provides treatment in accordance with the state schools by looking at the impact of science in the surrounding environment students (Poedjiadi, 2005). Therefore, learning science based SETS can improve learning outcomes. This is consistent with the results of research Benadja (2007), that the learning model envisions STS and SETS in science learning both in elementary, junior high or high school has given good results and can be used to improve the quality of learning, especially for aspects of the mastery of concepts, process skills, attitude and application of concepts. Similarly, the results of research Hidayat (1996) mentions that the learning model SETS is teaching that engage learners as scientists, conducting scientific process, can be used to train and develop the intellectual skills, scientific attitudes students, and the ability to solve daily problems objectively and rational.

In relation with the results of these research can be explained that the learning model SETS can provide the learning process as a whole, because students are able to understand natural phenomena through problem-solving activities. Learning with this model not only learn science as a product, memorize concepts, theories and laws, but has been able to cultivate a curiosity about natural phenomena and the causal links that cause problems in the environment and society, looking for problem-solving procedures through scientific methods, as well as applying the results in everyday.

The difference in the environmental knowledge students after being given treatment learning SETS model and the conventional model derived from the results of testing the hypothesis, that $T_{\text{test}} = 2,805 > T_{\text{table}} = 2,000$, and $\text{sig. } (?) = 0,007 < \alpha = 0,05$, then H_0 is rejected, meaning that there are significant differences the average value of the environmental knowledge students after being given treatment. Thus the environmental knowledge of students who use the learning science based SETS model higher than the knowledge of learners who use conventional learning models. This is consistent with the results of research conducted by Rumansyah, that the application of scientific approaches, the environment, technology and society can provide a better learning outcomes than conventional learning (Wahid, 2007).

The study provides an understanding that learning science with the concept SETS resulted in increasing knowledge and mastery learning higher in the experimental class compared to the control class for SETS learning model has been able to give a comprehensive understanding of the students, inviting them to form a cognitive aspect through direct observation of object- objects related to the theme of learning, providing experience in everyday life in the working group. Thus the learning science based SETS model more effective in improving the environmental knowledge students compared with conventional learning.

Conclusion

1. There were no significant differences in the environmental knowledge students before being given treatment learning SETS models and conventional. The level of environmental knowledge students before being given treatment is the same.
2. The learning SETS model have a significant influence on the improvement of the environmental knowledge students. SETS learning model effectively improve the environmental knowledge of the students at Kendari Islamic Junior High School.
3. There are significant differences of environmental knowledge students are given treatment after learning SETS model and conventional. The level of environmental knowledge of the students using model SETS higher compared with the environmental knowledge of the students who use the conventional model at Kendari Islamic Junior High School.

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