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PREFACE

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We appreciate the implementation of the 3rd International Conference on Early Childhood Education by the Committee of Early Childhood Education Department, Faculty of Education, State University of Padang. This conference has become an important agenda every two years of the Early Childhood Department. This activitiy supports the vision and mission of State University of Padang, and Faculty of Education will be an excellence institution in 2020 in Southeast Asia.

Early Childhood Education Conference is very useful for many people, especially for child educators, academics, researchers and students. In this conference will be discussed various issues related to early childhood education under the theme of holistic and integrative which is the issue today and future. These issues will develop awareness in education department, schools and social. Throughout this conference supports the interaction and communication between observers of early childhood education from various regions, national and international.

We expect from this conference will produce a variety of studies of early childhood education and recommendations for the competent stakeholders. So, it will support synergy relationship between universities, stakeholders and communities in building and developing early childhood education, better and more development in the future.

Congratulations for conferences committee.

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CONTENTS

THE DEVELOPMENT OF OUTDOOR-BASED SCIENCE LEARNING MODEL FOR LOWER-CLASS IN ELEMENTARY SCHOOL

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Abstract

The study about development of outdoor-based learning science model is focused on problems in the school environment. Science learning model is developed discussing about environmental problems in school by facilitating students to have an outdoor class study. The learning process in focused on the development of student's attitude or caring behavior about school environment. This research uses Research and Development model with the subject of the research is 21 students in A third grade SDN 09 Surau Gadang in Nanggalo district as experimental class. 20 students in B third grade SDN 09 Surau Gadang in Nanggalo district as control class. The model is implemented outside the classroom and watching the video. The result is obtained showed the student's mastering-concept is categorized as good with normalized gain score as 0.4. student's attitude or caring behavior about school environment is categorized as high concern with normalized gain score as 0 31. The advantages of this model is could increase student's mastering-concept in lower-class elementary school and enforcement student's caring attitude.

Keywords: science learning, elementary school, outdoor-based models.

Introduction

No doubt that science education has an important role in the development of human resources. Basically, anyone can serve as a resource in a particular society. Besides the competencies that need to be owned by them life skills and lifelong education which is the key competencies for those who serve as human resources. Through the learning of Natural Sciences ability students were given lunch. But lately about the allegedly poor quality of science education, which is characterized by poor thinking skills of students, lack of and inability to apply the subject matter in real situations in life. On the other hand in the application of science in elementary common occurrence of misconceptions. At primary level, teachers have difficulty implementing the curriculum because of the heavy burden of duties other than teaching. This makes it difficult to implement teacher development materials and develop themselves professionally. PGSD students therefore need to be given the opportunity to master the basic concepts of science and its application in everyday life.

On the other hand the constraints are also faced by low-grade primary school students is unfamiliarity regarding behavior towards an environmental school. Students do not understand what and how to behave in order orderly school

environment, in order to avoid contamination, so that students are able to reduce the cost of electricity rising, know how to make savings. This needs to be explained to students by using the outdoor models.

Review of Literature

Learning is an individual effort to obtain the overall behavior changes that include cognitive, psychomotor, and affective (Dori and Barak, 2001). However, in the implementation process of learning in schools more emphasis on achieving cognitive aspects implemented through various strategies, approaches, and learning models. Affective learning to develop students' abilities are lacking attention. Outdoor-based learning in the learning objectives more emphasis towards the formation of attitudes and concerns of students. Because it is through learning-based environmental education outdoor expected achievement of learning objectives that include cognitive, psychomotor, and affective can be optimized (Hess-Quimbita & Michael, 2014).

Dumouchel (2003) states that learning outside the classroom (outdoor) aims to raise awareness of the learner to: (1) self through everyday problems, (2) others through group problems and in decision-making, (3) nature through direct observation. Outdoor learning-based environmental education conducted outside the classroom by involving learners to blend with nature and perform a variety of learning activities that lead to the realization of learners' behavior change towards the environment. Added Coyle (2004) that outdoor learning is an effort to assist students in achieving the learning objectives, avoid boredom, boredom, and the perception of learning only in the classroom. Outdoor learning is one way to help learners achieve learning objectives, avoid burnout, boredom and perceptual learning in the classroom only. Therefore this model is very suitable to be applied to low-grade primary school students with lower grade elementary assumptions learning can be carried out while playing.

Based on the study above, the formulation of the problem which is based on theoretical viewpoint which relates to the implementation of outdoor-based science learning and the impact of its implementation in life. Because of the problems examined with regard to what is encountered low-grade (grade 3) elementary school students daily, as follows: (1) How is the implementation of outdoor-based science learning. (2) How does the impact of implementation of outdoor-based science learning.

Methodology

Research design approach research and development which refers to Borg (2008). Components of research design includes four stages, namely: (1) a preliminary study, (2) designing the model, (3) the development of learning model, (4) validation of the model. In the implementation phase of this study form a cycle that begins with a preliminary study to find the design of the initial model, then developed through testing. The development model is based on preliminary findings of the study, then tested in a given situation and a revision of the trial results, until a final model, ie a model that can be used to improve the learning

process. Testing model developed using the method of quasi-experimental design with pretest-posttest control group (Creswell, 1994).

Table 1. Design of Implementation of Learning Model

Class	Pretest	Treatment	Posttest
Experiment	O1	X1	O2
Control	O1	X2	O2

Pollution in learning, students conduct exploration activities in the form of trial. After the experiment, students in each group conduct explanatory activities in the form of inter-group discussion. Students present the results of an experiment for 15 minutes, and other groups respond. In the course of discussion among the group, the teacher gives the student obtained reinforcement concept. Before starting the learning students are given a pre-test on the material contamination. Problem mastery pollution concept consists of two forms, namely the concept of verbal and concrete concepts. Done learning students are given a post-test with the same problem.

Results and Discussion

Science learning models are developed on the basis of constructive, contextual, and behavior. Learning objectives to be achieved include improving the ability of students include the ability: to master the concept of science education, environmental stewardship school. in addition, it is expected the outdoor models can foster a caring attitude towards the environment and become an example for students who did not use the outdoor learning. Learning implementation includes three subjects, namely: water pollution, soil pollution, and energy savings.

Implementation of Outdoor-Based Science Learning Model

Learning Implementation of Water Pollution

Material water pollution in this study focused on water purification. The water cleared up because contaminated object or substance. Contaminated water due to objects such as soil or mud can still be clarified, so that the water becomes cleaner. Water purification process needs to be explained to the prospective teachers in order to cope with the water crisis, especially in elementary school. This is because generally in elementary school well water turbid with mud. The results of pre-test analysis to answer water pollution grade students experiment showed that students find it difficult because they have not yet been studied water pollution so as students have not had prior knowledge of the concept in question. After the students are taught through experiments the post-test analysis results show that outdoor-based science learning can enhance students' mastery of concepts. After the experiment the students make a report of the experiment. At the time of reporting the experiment, students are trained to analyze and present data in tabular form the results of the experiment or image.

Exercise is necessary for students' difficulties in presenting the data in tables or images.

An increase in the average score of post test showed that water pollution learning science experiment-based outdoor activities can improve students' mastery of concepts. It can be applied by students in everyday life. Students give examples better to eat fruit than foods made from flour spices and additives. No exception that the water used as solvent is less clean water.

Learning Implementation of Soil Pollution

One cause pollution of land was flooded. Floods can occur because the waste discharged into sewers or streams. Contaminated soil causes plant growth is compromised, dwarf, even sterile. Relating to the preservation of the soil, the soil contamination learning for elementary school students have to be discussed problem of waste and how to manage them. Composting of garbage is one way to manage waste that are easily carried by the student. Useful compost to improve soil texture, so it can nourish plants.

Before learning, students are given a pre-test on the material soil pollution. Problem control of soil pollution concept consists of two questions the concept, the concept of verbal and concrete concepts. Verbal concept in question is the concept of soil, humus, compost, and waste management. Concrete concept in question is the concept of composting. Done learning students are given a post-test with about the same as the pre-test.

In the study soil contamination, students conduct exploration activities in the form of trial. After the experiment, each group performs explanation activity in the form of inter-group discussion. Students from the group renderers present the results of his experiments and other groups respond. When given 10 minutes to present the results of the experiment. In the course of discussions between groups, lecturers provide reinforcement to the draft obtained by the students. The results of pre-test analysis of soil contamination shows that students find it difficult with the problems associated with composting. After the students conduct experiments composting, the obtained results of the post-test where all questions can be answered correctly by more than 60% of students.

Results of the test data analysis of soil contamination in class experiments showed that outdoor-based science learning can enhance students' mastery of the concept of soil contamination. This is because the learning is done with the experiment outside the classroom. Students acquire knowledge through real experience outside the classroom. Folk (2001) states that students who take learning outside the classroom to increase science learning as much as 57%, increase in interest as much as 52%, and changes in behavior as much as 38%. Bloom (Anderson and Krathwohl, 2001) states that the environment outside the classroom can bring learners in a more concrete situation and impact increase their appreciation of the concepts being taught. Other than that, learning outside the classroom can foster a desire to learn. SEER study conducted found that the enthusiasm and desire of students to learn increases in each school who applied learning outside the classroom (NAAEE, 2001). Knowledge of soil pollution, especially waste management can be applied by students in everyday life. Shame

throw garbage just anywhere because it can lead to drains become clogged, the water is stagnant, resulting in floods, and the emergence of various diseases.

Table 2. Increased Mastery Science Concept Outdoor based on the Experimental Class

o.	Learning Material	Pretest		Posttest		Average of Gain Score
		Average	Stand. dev	Average	Stand. dev	
1	All	50.59	7.16	79.73	6.24	0.59
2	Water pollution	50.54	8.15	79.59	7.21	0.58
3	Soil pollution	51.22	10.57	79.73	7.90	0.60
4	Energy Saving	49.73	8.07	82.30	9.83	0.56

The increasing of concept mastering by the students could be indicated by seeing the average of gain score from the score of pre-test and post test. After analysis process is obtained the gain score average as 0.59 in experiment class. The increasing of environmental education concept as categorized as middle. In control class, its obtained gain score average as 0.24

Learning Implementation of the Energy Saving

Electricity is the energy used to meet the needs of human's life. Electricity is used in every human activities in house, office, factory and school. therefore, it is necessary to save the energy used of electricity. Therefore it is necessary to save the use of electric energy. By saving electricity it means that we have participated to government program in associating to the development of a source of electrical energy, in addition to lowering the cost of electricity bills every month. Saving electricity did not mean reducing the activities, but efficient in using the energy. For instance, using the energy saving-lamp, remove the plug from the outlet when the electrical equipments is not use, reduce of using electricity especially in 19.00 – 22.00 (Powers, 2004).

In learning process about the saving energy, students learn how to save the using of electricity and choose the electrical-saving equipments from the instructional learning-video. After watching the video, students discuss the topic about saving energy in school environment. In discussion activities, teacher gives reinforcement to the students.

Before starting the learning process, student is given pre-test about electrical saving energy. Concept-mastering consist of two forms, verbal and concrete concept. Verbal concept is asked about how to manage and save electrical energy. In concrete concept students is asked about electrical equipments.

The result of pre-test saving energy in class experiments howed that students have difficulty in answering the questions that related to ability in form of table dan image. Post-test analysis in the experiment class showed that all the questions is answered correctly more than 60 % students. Besides, learning material about energy saving by using outdoor-based model and video could increase student's

concept-mastering. The average score of improving student's concept-mastering about saving energy in control class 36 % and 68 % in experiment class. It is showed that outdoor-based learning for topic saving energy could improve student's concept-mastering.

Impact of Implementation of Outdoor-Based Science Learning Model

The impact of implementing outdoor-based learning especially for enhance student's attitude and behavior in daily life. It caused that attitude is something which is difficult to change. So that, the attitude need to be enforced earlier such as in Elementary School. Character building in topic water pollution could be done by illustration about the consequences of wasting water. For instance, in every schools have 5 water-crane, if 3 water-crane is not close tightly, the water still dripping and it can be calculated the volume water waste in one school.

Students is asked to calculate wasted water volume in a city which has a dozen of schools. The wasting water happened because of the negligence or indifference to the water tap is still open. To convince students about the use of waste water, the teacher gives the students the task of measuring the volume of water dripping on a water faucet within 10 minutes. After that, teacher guides students to calculated water volume which is wasted in one water-crane, two water-crane and so on. Respond that is expected is teacher invites students to check water-crane and closed it tightly. Through this illustration as students are expected to be formed thrift water consumption.

Attitude building from the composting could be done by illustrating thrown a garbage. Generally, most of garbage in school are coming from the food-wrapping plastic, papers and etc. Imagine when the garbage is not collected for one week, there is a pile of garbage by 1 m^3 at a school. Then, imagine if the garbage piled up for several months at the school. school community could manage the garbage well in order to avoid storage. Relating to the composting, students are trained to choose a organic and inorganic garbage before throwing to trash bin. Students could observe how the organic will destroyed and inorganic not. Therefore, teacher needs to monitor their students in throwing a garbage. Teachers give reward to students who perform sorting of waste before it is discharged into place and give a warning or penalty on students who throw garbage just anywhere.

Attitude building could be done through topic energy saving by giving ilustration about the waste of electricity used in school. Every schools have much electricity equipments such as fan, lamp, refrigerator and etc. Usually, most of lamps in classroom are forgot to turn off. Besides, fan and TV in teacher's room keep alive whether the room is empty. The impacts of bad attitudes could be seen on the increasing of school electricity bill. Electricity bill could be shown to the students in order to motivated them practicing energy saving attitude. Then, teacher asks students to have an awareness toward energy saving such as turning off the light when is not use. Teacher is allowed giving warn or penalties to students who not turning off the light during the day. And, on the other hands, teacher will give a reward to students who practice it. The students habitual in saving energy consumption is expected to be the behavior of savers use electricity wherever they are.

The result of student's data analysis toward school environment shows the average score attitude 72.62 and a standard deviation 6.02. Based on the assessment categories such as affective as shown in the table below, it could be explained that the average of affective score toward environmental awareness is categorized as higher concern. Affective score categories is being a comparison is stated based on normal curve. The ideal score average and ideal standard deviation (Hadi, 2001)

Table 3. Category of Attitude Score

Interval	Score (X)	Category of Attitude
$X > (Xi + 1.5\ Si)$	$X > 71.5$	Very care
$(Xi) < X1 \leq (Xi + 1.5\ Si)$	$55 < X \leq 71.5$	Care
$(Xi - 1.5\ Si) < X \leq (Xi)$	$38.5 < X \leq 55$	Careless
$X \leq (Xi - 1.5\ Si)$	$X \leq 38.5$	Not care

Furthermore, student's attitude are reviewed from the initial knowledge group. Students from the higher initial knowledge group obtain score as 74.90 and standard deviation as 7.45. Student's attitude in the experiment class is categorized as high concern. Students from the middle group obtain average score as 72.63 and standard deviation as 5.94. Student's attitude in middle experiment class is categorized as high concern. Students in lower group obtained average score as 70.64 and standard deviation as 4.25. Student's attitude in lower group experiment class is categorized as concern.

Table 4. Students Attitudes toward School Environment

Initial Ability of Students	Average	Standard Deviation	Category
High	74.90	7.45	Very care
Medium	72.63	5.94	Very care
Low	70.64	4.25	Care

Conclusion

Student's ability in mastering environmental education concept includes four main topics, water pollution, soil pollution, and energy saving. The impact of implementing outdoor-based science learning is reviewed from the student's result study consist of affective, cognitive and psychomotor aspect. The increased of mastering environmental education concept could be seen in cognitive aspect and is categorized as good. Water pollution concept, soil pollution and energy saving. Student's psychomotor aspect could be seen in doing experiment and attitude toward school environmental. It is categorized as very good. Then, student's attitude toward school environmental is categorized as high concern.

Reference

Anderson dan Krathwohl, 2001. A Taxonomy for Learning, Teaching and Assesing. New York: Addison Wesley Longman.

Borg and Gall. 2008. *Education Research : An Introdutin*. Fifth Edition. New York: Longman

Coyle, K. J. D. 2004. *Understanding Environmental Literacy in America*: And Making it a Reality. Journal of Environmental Education. Vol. 47 (1). p. 1063 – 1068.

Cresweli. J.W. 1994. *Reseach Design: Qualitatif and Quantitatif Approaches*. New Delhi: Sage Productions.

Domouchel. 2003. *New Horizons for Learning*. Online: http://www.newhorizons.org.

Dori, Y.J. and Barak. 2001. *Fresmen Learning in a web-Based Chemistry Course*. Journal of Chemical Education. Departement of Education in tecnologyand Science, Israel, Institute of Technology. Haifa, Vol. 25 . p. 4 – 10.

Hadi, R.R. 1990. *Analizing Change/Gain Scores*. American Educational Reseach Assosiationn's Division D. Measurement and Reseach Metodologi.

Hess-Quimbita, G. & Michael, P. 2014. Assessing an Environmental Attitude Development Program: Factors Influencing the Environmental Attitude of College Students. The American Environmental Education of Journal. Vol. 05 (6). p. 192 – 197.

North American Association for Environmental Education. 2001. *Using Environmental Based Education to Advance Learning Skill and Character Development*. Wahington D.C: NEE & Training Foundation

Powers, A.L. 2004. Teachers Preparation for Environmental Education: Faculty Perspective on the Infusion of Environmental Education into Preservice MethodssCourses. Journal of Environmental Education: Faculty Perspective on the Infusion of Environmental Education, Spring: vol. 35 No 3.