The Effect of the Radec Learning Model on the Character of Care for the Environment of SD Students

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Abstract: The environment is very important for human life. One of the causes of the lack of knowledge and public awareness of the environment is that they are not accustomed to protecting the environment from an early age. This study aims to analyze the differences in the environmental care character of students who learn using the RADEC model and conventional methods. This research method uses a quantitative approach with a quasi-experimental design. Class V participants in two public elementary schools in the Cipongkor sub-district with a total of 15 people each. The data collection technique was done by non-test using a questionnaire. Descriptive quantitative data analysis technique. The results of the study prove that the application of the RADEC model has a significant effect and can improve the character of students' environmental care. This is in line with the average value of environmental care characters in the experimental class that applies the RADEC 91.4 model in the "Very High" category. While in the control class 58.5 in the "Medium" category. There is a difference in the average value of the environmental care character of 32.9 between the experimental class and the control class.

Keywords: Learning model, Radec, Environmental care character

Introduction

Education does not only equip students with skills and expertise such as problem solving abilities. However, education is also one of the basic strategies of building the nation's character. The education unit is an important component in character building that runs systemically and integratively. Indonesia is a country with a strong culture, upholding the values of the nation's wisdom. These values are always wanted to be maintained and maintained as a symbol of the state of Indonesia as a cultured country. “Nowadays, although slowly but surely, character values are starting to be eroded by a materialistic attitude.

Spiritual culture is replaced with material culture, which makes one's progress and success measured in one's mastery of the material, not on the height of morality (character) and character. (Rif’ah, 2020). Character education according to Lickona, (1991) Education is education to shape individual personality through character education, the results of which can be seen in a person's real actions, namely honest, kind behavior, respecting the rights of others, hard work, and responsibility. Education has a noble purpose for human life and the environment. The environment has an important role for the survival of living things, so we need to maintain its sustainability because if the environment is damaged, living things will find it difficult to survive (Mardiyani et al., 2020).

Environmental sustainability will determine human life itself and other creatures, and vice versa that humans can determine the state of the environment itself (Agustin et al., 2021). The implementation of sustainable development and the controlled use of natural resources are the objectives of environmental management (Nina Herlina, 2017). Lately, Indonesia has experienced many natural disasters caused by mistakes and the way humans treat the environment such as floods, landslides, etc. The disaster occurred due to many factors, one of which is environmental damage. Humans tend to exploit the environment for their interests without paying attention to environmental sustainability.

Every potential natural resource is exploited to meet needs without paying

attention to the interests of environmental sustainability (Supriatna, 2017). One example of the lack of concern for the environment is the emergence of environmental pollution. Environmental pollution is a catastrophe for students who live in it, it will indirectly affect the comfort of student learning at school (Agustin, 2011). The development of the times, increasing human population, higher education, increasingly sophisticated technology are supporting factors that directly cause the decline in environmental quality which of course cannot be stopped. (Natalia et al., 2022).

To improve the environment, community movements in various fields are needed, including the education movement in schools (Supriatna, 2017). One of the efforts to overcome environmental problems is through the formation of environmental care characters from an early age. According to Ismail, (2021) that instilling an attitude of caring for the environment towards students can be started from maintaining the cleanliness of the classroom and school by disposing of garbage in its place, doing class pickets, caring for plants, and so on. The main cause of environmental pollution today is the problem of waste.

This is due to the lack of knowledge and public awareness of waste management. There are many phenomena of residents littering, such as throwing garbage from cars, storing trash under study desks, throwing trash into rivers and even phenomena in schools that plastic waste is used as a bullying tool. It is not without reason that they do this, one of the reasons is that they are not accustomed to elementary school students, so that when students grow up they do not have the ability to solve the problems they face. The type of food is also one of the causes, the food provided in the school stall is no longer found traditional food that is not wrapped in plastic.

Snacks wrapped in plastic become the student's choice, so that the production of plastic waste in schools continues to increase every day. Therefore, the development of environmental care character values in students needs to be instilled from an early age. An innovative learning model is needed so that students understand and understand the material presented to be implemented. One of the learning models related to the attitude of the environmental care

character of elementary school students is the RADEC (Read, Answer, Discuss, Explain, Create). Sopandi, (2017) develop a learning model that considers maximally the typical conditions that exist in Indonesia. The learning model in question is the Read-Answer-Discuss-Explain-and-Create learning model or abbreviated as RADEC.

Research Methods

This study uses a quantitative approach with a quasi-experimental design in two public elementary schools in the Cipongkor District, West Bandung Regency with the Nonequivalent Control Group Design, which is a questionnaire design after being treated in each group. The indicators of the attitude of caring for the environment according to Irfianti, M. D., Khanafiyah, S., & Astuti (2016) described, namely: in an effort to prevent damage to the surrounding natural environment include: environmental care, reducing the use of plastic, waste management, reducing carbon emissions, and saving energy. Furthermore, in an effort to repair the natural damage that has occurred, it includes: planting trees, and utilizing used goods.

Table 1
Environmental Care Character Instrument Grid

Variable	Indicator	Number of Items	Pernyataan	
			Positif (+)	Negative (-)
Efforts to prevent damage to the natural environment	1. Environmental care (PL)	5	11, 15, 16	23, 25
	2. Reducing use of plastic (PPl)	3	6, 18	10
	3. Waste management (PS)	4	1, 2	4, 20
	4. Carbon emission reduction (PEC)	3	3, 19	8
	5. Energy saving (PE)	3	5, 17	14
Efforts to repair natural damage	6. Tree planting (PPO)	3	9, 13	22
	7. Use of used goods (PB)	4	7, 24	12, 21
Number of Items		25		

This research procedure consists of three stages, namely the preparation stage, the implementation stage, and the data processing stage. In the preparation stage, various activities will be carried out, including determining the topics of teaching materials, making and developing the topics of teaching materials, compiling instruments, testing instruments to test validity, improving instruments, and observing learning in schools. In the implementation stage, learning is carried out according to the schedule and materials that have been agreed upon at the preparation stage. At the time of learning, there are non-test instruments that will be carried out in the experimental class and the control class. The instrument is in the form of a character questionnaire for environmental care. Treatment through learning is carried out 12 times with the steps referring to the learning implementation plan.

Results and Discussion

Questionnaire data is used to see the environmental care character variable between the experimental class and the control class. After collecting data through filling out questionnaires, the researchers got the results by looking at the aspects of environmental care being studied. The environmental care questionnaire data was collected after being given treatment in the learning experiment class using the RADEC model, while the control class used a conventional model to see the difference in the effect of the learning model applied to the experimental class against the conventional model applied in the control class.

This normality test was carried out on the environmental care character questionnaire data to determine the effect of the treatment carried out on the distribution of data in each sample class. In the experimental class a significance value of 0.000 was obtained and in the control class a value of 0.200 was obtained. If the significance is determined by = 0.05 then the data can be translated as follows: the experimental class is not normally distributed because $0.000 < 0.05$ and the control class is normally distributed because $0.200 > 0.05$. After the data is tested for normality, the next step is to perform a homogeneity test using the Levene test statistic on the IBM SPSS Statistics version 24

program with a significance level of = 0.05.

The results of the homogeneity test show F = 0.589 which means that F > 0.05, it can be concluded that there is no difference in the variance of the environmental care character questionnaire data between the experimental class and the control class or the data is homogeneous. Based on the results of the normality test and homogeneity test, it is stated that the population data is not normally distributed, but the data is homogeneous. In accordance with the prerequisites, the parametric test can only be performed if the data is normally distributed and homogeneous. Therefore, the data must be tested through the Mann Whitney non-parametric test because the data is not normally distributed and homogeneous.

Based on the results of the calculation of the non-parametric Mann Whitney test, the independent sample of post-test data for the experimental class and the control class can be seen that Pvalue < 0,05 so it can be concluded that there is a significant difference in the results of the questionnaire on the environmental care character of students in the experimental class and the control class. This shows that the environmental care character of students in the experimental class after using the RADEC model and the control class using the conventional method does not have the same increase in significance because there are significant differences based on the results of the Mann-Whitney non-parametric test.

Thus, it can be concluded that there is an effect of learning the RADEC model in the experimental class on increasing students' environmental care character. The environmental care character analysis has a purpose, to see the effectiveness of the RADEC model in improving the students' environmental care character. This can be seen from the results of filling out the questionnaire in the experimental class and the control class. The questionnaire measures the effect of the RADEC model on the environmental care character of students after the treatment activities are carried out. The following table analyzes the results of the questionnaire with the following scoring criteria:

Criteria for Scoring Category of Environmental Care Character Questionnaire Score

Very high : 81-100
High : 61-80
Medium : 41-60
Low : 21-40
Very low : 0-20

Table 2
Comparative Analysis of the Questionnaire Results of Environmental Care Characters in Experiment Class and Control Class

No.	Indicator	Experiment Class			Control Class			Difference
		Average Score	Conversion	Category	Average Score	Conversion	Category	
1.	PL	19,1	95,3	Very high	13,5	67,3	High	28,0
2.	PPl	9,5	78,9	High	7,3	61,1	High	17,8
3.	PS	15,6	97,5	Very high	9,0	56,3	Medium	41,2
4.	PEC	10,0	83,3	Very high	7,5	62,8	High	20,5
5.	PE	11,7	97,8	Very high	6,7	56,1	Medium	41,7
6.	PPO	11,7	97,2	Very high	6,5	53,9	Medium	43,3
7.	PB	14,3	89,6	Very high	8,3	52,1	Medium	37,5
	Average	**13,1**	**91,4**	**Very High**	**8,4**	**58,5**	**Medium**	**32,9**

The results of the average achievement of environmental care character indicators in the experimental class and control class. There is a significant difference, in the experimental class the environmental care indicator shows a score of 19.1, while the control class gets a score of 13.5, in the plastic use indicator the experimental class shows a score of 9.5, while the control class gets a score of 7.3. on the waste management indicator the experimental class shows a score of 15.6, while in the control class it gets a score of 9.0, on the

indicator of reducing carbon emissions the experimental class shows a score of 10.0.

while in the control class it gets a score of 7.5, on the indicator of savings the control class showed a score of 11.7, while the control class scored 6.7, the experimental class tree planting indicator showed a score of 11.7, while the control class scored 6.5, the experimental class used used goods indicators showed a score of 14.3, while the control class scored 8.3. The following is presented data analysis of the results of the acquisition of the questionnaire in the form of a diagram:

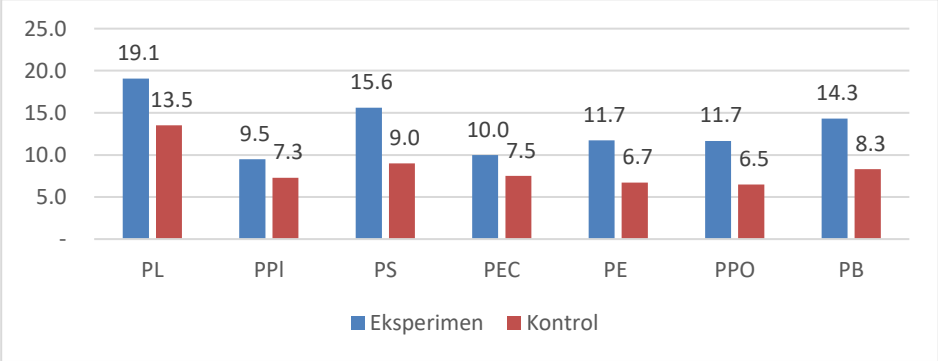

Diagram 1 Results of Analysis of the Average Value of Environmental Care Characters in the Experiment Class and Control Class

From table 2 and diagram 1, it is clear that there is a significant difference between the average scores of the experimental class and the control class on each indicator of the environmental care character. The most significant difference is found in the tree planting indicator with a conversion rate of 43.3. This is influenced by the condition of the school environment in the experimental class having sufficient land for planting plants so that in learning the RADEC model in the Create syntax, children can directly practice, while in the control class using the conventional model, they do not have enough land for plant planting activities.

In the energy saving indicator with a conversion rate of 41.7. This shows that the application of the RADEC learning model in the experimental class has a

significant influence on the habit of saving energy, both water and electricity. While in the control class that uses conventional methods, students are not accustomed to doing things or activities that show an attitude of saving energy. In the waste management indicator with a conversion rate of 41.2. This shows that the effect of implementing the RADEC learning model in the experimental class has a positive impact on students' ability to manage waste.

Activities in the RADEC create model syntax produce creative works from plastic waste that are processed into ecobricks and made shoe rack decorations. While in the control class with conventional learning methods, the emphasis is on cognitive and the dominance of teacher lectures becomes a routine for learning activities in the classroom, so that the waste management ability of students in the control class is under the experimental class in this study.The indicator for the use of used goods is at 37.5. This is almost the same as the waste management indicator because to collect and place the ecobricks, used drink bottles are needed that can still be used.

So that the experimental class in the Create syntax produces shoe rack decorations from plastic waste ecobricks. While in the control class, students are not accustomed to using used goods that can still be reused, such as drinking bottles. The environmental care indicator shows a conversion difference of 28.0. This shows that the use of the RADEC model in the experimental class has a significant effect on students' ability to care for the environment, in this case the school environment. The habit of picketing became a routine in the experimental class, with each being given responsibility for the plastic waste produced by each to be processed into ecobricks and put in their respective used bottles.

Each student has their own progress in managing the waste they produce. Meanwhile, in the control class with the conventional method, students were not involved and were not directed to manage the plastic waste they produced from plastic-wrapped snacks. In the indicator of reducing carbon emissions with a conversion difference of 20.5. This shows that the influence of the RADEC model applied to the experimental class is able to suppress the habit of students

going to and from school to be picked up by motorized vehicles. By learning the RADEC model, students learn to appreciate natural resources by reducing carbon emissions, especially vehicle fumes produced from fuel.

While in the control class with conventional methods, children are not accustomed to how to reduce the use of motorized vehicles to go to and from school.The indicator that shows the smallest difference is the indicator of plastic use with a conversion difference of 17.8. This shows that the difference between the experimental class and the control class is not so significant even though the results in the experimental class still show superiority to the control class. This is because the supply of snacks in both the experimental class and the control class is rarely found in traditional snacks that are not wrapped in plastic.Snacks served in school stalls or school canteens are already dominated by snacks wrapped in plastic so that there is always a lot of waste produced every day.

However, in the experimental class, the production of plastic waste from snack wrappers can be decomposed by making ecobricks for shoe rack decoration. So when compared to the control class which was not given responsibility for the production of plastic waste respectively, the experimental class students' abilities were above the control class students' abilities.This RADEC learning model has succeeded in increasing the students' environmental care character. The success that occurred in this study gave hope that the RADEC model could also be applied in learning other subjects and classes, while still taking into account the characteristics of the material to be studied.

Conclusion

Environmental care character of students in the control class tend to have an average that can be categorized as moderate environmental care character. While the experimental class based on the analysis has a very good environmental care character. The environmental care character in the experimental class gets a score in the very high category. Therefore, it proves that the application of the RADEC model has a significant effect and can improve the character of students' environmental care.

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