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EFFECTIVENESS OF RADEC LEARNING MODEL TO OVERCOME LEARNING PROBLEMS IN ELEMENTARY SCHOOL

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ABSTRACT

The (RADEC) model is a learning model that emphasizes the active involvement of students in learning through the stages of reading, answering, discussing, explaining, and making solutions to the problems encountered. This research is based on the low problem solving ability of students in solving problems in social science disciplines. The type of research used is quasi-experiment with pretest-posttest one group design and random sampling technique. The sample of this study amounted to 30 students who participated in social studies learning. Based on descriptive analysis, students' problem solving ability in the experimental class increased from the pretest score of 50.87 to 87.13 in the posttest, with an increase of 36.26. In the control class, there was an increase from the pretest value of 50.20 to 85.73 in the posttest, with an increase of 35.53. Hypothesis testing shows a significance value of 0.000 <0.05, which states that the use of the RADEC learning model has a significant effect on students' problem solving skills in social studies. These results prove that the alternative hypothesis (Ha) is acceptable and the null hypothesis (H0) is rejected.

1. PENDAHULUAN

Education in the 21st century has several problems, these problems will have an impact on the quality of education in the present if there is no change and habituation when the learning process is carried out, these problems such as the lack of skilled human resources, technological advances that continue to develop, the lack of critical thinking and problem solving skills in students, and the inequality of urban and rural schools.

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However, there are several solutions to encourage the implementation of 21st century education, such as curriculum development that emphasizes skill development, digital development in the learning process and teacher training to improve understanding of 21st century skills, problem solving and higher order thinking.

Problem solving skills provide an understanding that allows students to inform the facts of the problem situation at hand. Problem solving ability involves a broad understanding of analyzing and evaluating. Problem solving includes several aspects, namely the ability to analyze, evaluate, synthesize, and reflect. Problem-solving skills are very important in education because they help students develop a deep understanding of the material and make informed decisions (Rosardi & Zuchdi, 2014). In addition, problem-solving skills are also crucial in the discussion process, as it helps students deal with complex and diverse challenges and problems. Problem solving in social studies learning involves the ability to gather, apply, analyze, evaluate and make decisions based on a range of complex and diverse information. It requires skills in sorting out relevant information and data, evaluating sources of information, identifying strong and weak arguments, and drawing logical and consistent conclusions (Novianti et al., 2019).

In social studies learning, it is very important to use in-depth problem-solving skills, develop problem-solving skills, and develop problem-solving skills. (Astiwi et al., 2020). Through this process, students can learn how to identify problems, seek effective solutions, as well as make wise decisions based on available information. It also prepares them to participate actively and productively in society (Rosardi & Zuchdi, 2014). However, if social studies learning using problem-solving learning does not use a less interactive learning model, it is still not optimal, because the

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learning model will help the learning process and student involvement in the classroom.

A learning model is a way or approach that teachers use to teach so that students can more easily understand the material being taught (Nurfaizah, 2019). Learning models help students actively engage in lessons and solve complex problems. With the right learning model, learning becomes more interesting and students can be more understanding and skillful in facing various challenges (Legowo, 2017). In addition, according to (Pratama et al., 2019) that the steps used by teachers to achieve the expected goals are learning models, learning models can help teachers in solving various challenges at school and can have an impact on students so that the learning process becomes organized.

The model impacts students so that the learning process uses activeness and problem solving, namely the RADEC learning model (read, answer, discuss, explain, and create), the RADEC learning model is a model that invites students to be actively involved in the learning process. First, they read the material, then answer questions to understand what they have read (Kusumaningpuri & Fauziati, 2021). After that, students are invited to discuss with their classmates, explain what they understand, and finally, they create a solution or project based on what they have learned (Yulianti et al., 2023). This model helps students to be more critical and creative in the learning process. In addition, the RADEC learning model is an approach that names the stages of the process according to the steps used: read, answer, discuss, explain, and create. Various studies on the RADEC learning model have been conducted and the results show that this model is able to improve problem-solving skills (Tulljanah & Amini, 2021).

Various previous studies have been conducted by researchers using the RADEC learning model in social studies learning on student problem

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solving. Among them are research conducted by (Tulljanah & Amini, 2021) that the RADEC learning model as an alternative in improving higher order thinking skills in science learning in elementary schools, but in the process the material used is science not social studies where social studies contains material on various problems in society that can provide different problems and understanding. Furthermore, research from (Iwanda et al., 2022) The research used the RADEC learning model but only measured the effectiveness of the learning process instead of measuring how the model can help in problem solving in students. Some previous studies have used the RADEC learning model, but no one has conducted research to measure problem solving in social studies learning.

From the findings of previous research, it can be concluded that it is necessary to conduct research using the RADEC learning model to measure problem solving in social studies learning, with the aim of improving the learning process in social studies subjects to be more effective and comparatively.

2. METODE PENELITIAN

This research design is quantitative with experimental method, using pretest-posttest one group (Islami et al., 2019). The sample selection was chosen randomly, with each consisting of 15 samples, so that the total sample amounted to 30 students. This study involved an experimental class that used the RADEC model and a control class that used the conventional model. The instrument used was a test to measure students' problem solving ability of social studies material. Data analysis was conducted in two stages: descriptive and inferential. Descriptive analysis was used to describe the pretest and posttest results in the experimental and control classes by looking at the mean, standard deviation, and

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variance. Inferential analysis was used to test the hypothesis through the classical prerequisite test by checking the normality and homogeneity of the data. If the data is normally distributed and the variance is homogeneous, then the T test is carried out with the Paired sample test.

3. HASIL DAN PEMBAHASAN

Descriptive Analysis

Descriptive analysis was carried out for the pretest-posttest results in the experimental class and control class on students' problem solving skills. The following is table 1 to see the results obtained by students on problem solving.

Table 1. Problem Solving Ability

Class	Standard Deviation	*Means*	Maximum	Minimum
Pretest-Eksperimen	11,734	50,87	67	33
Posttest-Eksperimen	10,816	87,13	100	60
Pretest-Kontrol	11,521	50,20	73	33
Posttest-Kontrol	9,091	85,73	100	73

Based on the results recorded in table 1, it can be observed that there is a significant increase in both research groups in problem solving. The experimental group experienced an increase of 36.26 points, while the control group experienced an increase of 35.53 points. This difference shows that both the RADEC learning model applied to the experimental class and the conventional model in the control class are effective in improving students' ability to solve problems.

This significant improvement may be due to the characteristics of the learning model. The RADEC model, emphasizing active student engagement through reading, answering, discussing, explaining and creating, seems to provide greater opportunities for students to develop thinking and problem-solving skills. On the other hand, despite using the conventional approach, the control class also showed significant improvement, suggesting that this approach remains relevant in improving students' academic ability.

Nevertheless, the mean difference between the experimental and control classes signifies that the RADEC model may be more effective in producing greater improvements in problem-solving ability compared to

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the conventional approach. This indicates that an approach that focuses on active student engagement is significant in social studies learning.

Inferential Analysis

Classical Prerequisite Test

Classical Prerequisite Test is an important stage in statistical analysis that is carried out before conducting inferential statistical tests. Its main purpose is to check the basic assumptions that must be met before applying a particular statistical test. The two main aspects of the Classical Prerequisite Test are data normality and homogeneity of variance (Kusumantara, 2017). Data normality tests whether the data used for analysis has a normal distribution in the population. This assumption is important because many inferential statistical tests, such as the t-test, assume that the data comes from a normally distributed population. Homogeneity of variance tests whether the variances of the groups being compared in a statistical analysis are equal or homogeneous. This assumption is also important because some inferential statistical tests require the variances between groups being compared to be similar or not significantly different. If the data does not meet one or both of these assumptions, it can lead to misinterpretation of statistical test results (Setiana & Hardini, 2020). Therefore, the results of the Classical Prerequisite Test help researchers to determine whether the data meets the necessary assumptions before proceeding to further inferential statistical analysis. If the assumptions are not met, corrective measures or the use of alternative statistical methods may be required to ensure the validity and reliability of the analysis results.

Normality Test

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
KemampuanBerpikirKritis	PreEks	.115	15	.200*	.930	15	.269
	PosEks	.228	15	.034	.896	15	.081
	PreKon	.143	15	.200*	.958	15	.654
	PosKon	.155	15	.200*	.921	15	.198

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the results of the Shapiro-Wilk normality test, the Significance (Sig.) value obtained for each group is more than 0.05. In the

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context of classical assumptions in statistics, this indicates that the data from both groups can be considered normally distributed. The Shapiro-Wilk test is one of the commonly used methods for testing data normality. Results that show a value of Sig. > 0.05 indicates that there is not enough statistical evidence strong enough to reject the assumption that the data is normally distributed. This means that the data from both groups tend to follow the normal distribution pattern in the wider population.

It is important to note that the assumption of data normality is an important prerequisite for applying many inferential statistical tests, such as the t-test. With normally distributed data, the interpretation of statistical test results will be more valid and accurate. However, if the data does not meet the assumption of normality, researchers should consider data transformation or use non-parametric statistical methods that are more appropriate to the characteristics of the data at hand (Ningsih et al., 2021).

Homogeneity test

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
KemampuanBerpikirKritis	Based on Mean	.495	3	56	.687
	Based on Median	.416	3	56	.742
	Based on Median and with adjusted df	.416	3	52.590	.742
	Based on trimmed mean	.457	3	56	.714

Based on the homogeneity test results, the Significance (Sig.) value obtained is 0.687. According to classical assumptions in statistics, if the value of Sig. > 0.05, it can be concluded that the data has a homogeneous variance. Variance homogeneity tests such as Levene's test or F test can be used to test whether the variances of the groups being compared in statistical analysis are equal or homogeneous. The assumption of homogeneity of variance is important because many inferential statistical tests require that the variances between groups are not significantly different (Putri & Nurafni, 2021).

In this context, the value of Sig. = 0.687 indicates that there is not enough statistical evidence strong enough to reject the assumption that the variances of the two groups are homogeneous. That is, the difference between the variances of the groups is not statistically significant. Thus, based on the results of this homogeneity test, the classical assumptions are met and the data can be considered to have homogeneous variances.

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This is important to ensure that the interpretation of results from inferential statistical tests such as the t-test remains valid and reliable.

T-Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PretesEksperimen - PostEksperimen	-36.267	12.853	3.319	-43.385	-29.149	-10.928	14	.000
Pair 2	PreKontrol - PostKontrol	-35.533	14.177	3.660	-43.384	-27.682	-9.707	14	.000

Based on the results of the T test using the paired sample test, the Significance value (Sig.) obtained is 0.000. The assumption used in inferential statistics is that if the value of Sig. 2-tailed <0.05, then the alternative hypothesis (Ha) can be accepted and the null hypothesis (H0) is rejected. With a Sig. value as small as 0.000, we can conclude that there is a significant effect of using the RADEC model on students' problem solving skills in social studies learning. T test with paired sample test is used when we want to compare the average of two different conditions or times on the same group of subjects. The very small Sig. result indicates that the difference between pretest and posttest scores on students' problem solving ability is highly statistically significant after applying the RADEC learning model. This indicates that the RADEC model successfully improved students' problem-solving skills in the context of social studies learning.

These findings provide strong support for continuing the application of the RADEC model in educational contexts in or other schools, in an effort to improve students' problem-solving skills. In addition, these results also demonstrate the importance of hands-on learning processes in promoting active student learning, as embodied by the RADEC model.

4. SIMPULAN

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Based on descriptive analysis, there is a significant increase in problem solving in students after participating in social studies learning. The experimental class that applied the RADEC model showed an increase from a pretest score of 50.87 to a posttest of 87.13, with an increase of 36.26 points. Meanwhile, the control class that used the conventional approach also improved from a pretest score of 50.20 to a posttest of 85.73, with an increase of 35.53 points. This indicates that both the RADEC model and the conventional approach are effective in improving students' ability to solve problems. The results of hypothesis testing showed a Significance value (Sig.) of 0.000, which is smaller than alpha (0.05). This confirms that there is a significant effect of using the RADEC model on students' problem solving skills in social studies learning. Thus, the alternative hypothesis (Ha) is accepted and the null hypothesis (H0) is rejected, indicating that the RADEC model does have a significant positive impact. The implication of this finding is that an active learning approach that engages students directly, such as the RADEC model, can be an effective option to improve students' problem-solving ability in a social studies learning context. Teachers and educators may consider implementing this model in their classroom practice to maximize student learning outcomes. In addition, these results also underscore the importance of developing learning strategies that enable students to actively and critically participate in the teaching-learning process, in line with curriculum demands that emphasize the development of thinking and problem-solving skills.

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