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The Effect of Environmental Approach on Critical Thinking Ability in Elementary School Students' Science Content

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ABSTRACT

This research is motivated by fifth-grade students' low critical thinking skills in science subjects. A learning approach is needed to overcome these problems. This study aims to determine the effect of the environmental approach on the science critical thinking skills of fifth-grade elementary school students. This research is an experimental quantitative research that uses the Quasi-Experimental Design used in this study, namely the Nonequivalent Control Group Design with data analysis paired sample t-test. The sample used in this study is fifth grade, as many as 35 elementary school students. It was concluded that from the results of the paired sample t-test hypothesis test, the results showed Sig. (2-tailed) 0.000. If Sig. (2-tailed) 0.000 < (0.05), then Ha is accepted, which means that there is an influence from the environmental approach on students' critical thinking skills.

Keywords: *environmental approach, critical thinking, science content*

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INTRODUCTION

In today's era, there are still many teachers who use the lecture method only and are less varied in the delivery of material so that most students listen after they forget. An explanation is insufficient for students to understand the material, especially in elementary school. It is in line with the opinion (Susanti & Mulyani, 2013). Learning will be more meaningful if students can experiment, analyze, and find out for themselves.

Various approaches can be used, one of which is the environmental approach. In today's era, there are still many schools that carry out the learning process only in the classroom and are less varied in the delivery of material so that most students only listen and focus on the teacher who teaches in class. Hence, students are more easily bored (Susanti & Mulyani, 2013). For example, outdoors or in the environment, both the social environment and the natural environment. Leather & Nicolis (Deringer, 2017) said that outdoor education has a goal: to instill an educational

experience in students, which has a lot of benefits. That way, students never feel like learning outside the classroom. The environmental approach is a way to start learning by utilizing the surrounding environment as a source and teaching media. Mustakim (2018) said that the environmental approach is used in the learning process involving the environment as a learning resource. In addition to the surrounding environment as a source and learning media, students can gain a more meaningful and meaningful learning experience by applying an environmental approach to the learning process. The advantages of using an environmental approach according to Uno et al. (Eli & Fajari 2020) learning activities will be more interesting and fun, learning will be more meaningful because it is easier to understand.

Environmental-based learning (Karjiyadi, 2013) argues that environment-based learning leads to learning that utilizes the environment as a source of learning. The environment can be formatted or used as a learning resource. In this case, the teacher can link the material being taught with students' real-world situations so that they can encourage students to make connections between the knowledge they have and their application in everyday life. This approach is in line with the principles of STEAM (Science and Technology reviewed through engineering and art, which is based on elements of mathematics). STEAM learning is an educational concept that focuses on collaboration, directing children to think critically and creatively, innovate and find solutions (problem-solving) based on moral values and local culture.

An environmental approach is an approach that involves the natural environment as a learning resource. Mulyasa (Adela, 2019) argues that applying an environmental approach in the learning process can attract students' attention. In addition, Larimore et al. (Ardoin & Bowers, 2020) argue that in early childhood, if an environmental approach is applied to the learning process, it can increase students' appreciation and closeness to the environment. The environmental approach is said to be a learning approach that is not teacher-centered. However, students are active and participate in the learning process. With this approach, students can observe and experiment directly so that students can analyze the phenomena that occur. Place-Based Education (PBE) is an approach that is carried out by applying patterns, 1) Community, 2) Environment-based, 3) Local potential, and 4) meaningful. Place-based education uses local communities and neighborhoods as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects throughout the curriculum.

The application of such an approach will have an impact on students' thinking skills. Rodiyana (Puspitasari & Rodiyana, 2019) argues that critical thinking is thinking that is accompanied by reasons and is responsible for the causes and answers that have been chosen, accompanied by evidence to support it so that conclusions can be drawn. While Paul and Elder (Shaarawy, 2014) argue that critical thinking is an art of thinking that leads to analyzing and evaluating what exists intending to improve one's quality, as he puts it as follows, "the art of analyzing and evaluating thinking to improve it." Students can develop their knowledge more broadly so that the level of students critical thinking skills can develop. According to the opinion of (Anindyta & Suwarjo, 2014), if you want to see how far students' ability to think can be seen in living their daily lives because someone who is a critical thinker has the characteristics of being curious. Seeking the truth is confident in his reasoning, has an open attitude, and can analyze and think systematically. From statement (Christina & Kristin, 2016) states that there is a goal of critical thinking, namely, students can understand what other people, especially teachers, can understand other people's arguments and make and express their own arguments.

H.W Flowler (Trianto, 2013) states that science is a systematic and formulated knowledge of material phenomena based primarily on observation and deduction. Inner revelation (Trianto, 2013) said that science is a collection of systematically arranged knowledge, and in general, its use is limited to natural phenomena. Aly and Rahma (Afandi, 2013) argue that science is a theoretical science that is systematically arranged and obtained specifically by observing (observing) experiments, experimenting or trying, drawing conclusions, formulating theories, experimentation, observations (observations), and so on, all of which relate to each other. Widodo (Sardinah et al., 2013) argues that the process of learning science subjects if it only teaches facts, concepts, laws, principles, and theories. It is stated that the science learning process is not entirely implemented.

The teacher integrates subjects in working on educational place-based questions that make the teaching and learning process meaningful. Place-Based education to gain experience, students can learn from real things and apply critical thinking skills. Environment-based instruction directs students to become environmental creators, not environmental connoisseurs. The uniqueness of each school is a separate effort that teachers and students can make to integrate environmental learning with local capabilities.

METHOD

Through a quantitative method approach with the aim of testing and proving the hypothesis that has been made and determined, the researcher uses an experimental method approach. The research design was carried out to find answers to the questions in the problem formulation and to prove the hypotheses that had been proposed previously. The method used is experimental, a research method used to find the effect of certain treatments on others under controlled conditions. (Sugiyono, 2018).

The research design in this study uses a Quasi-Experimental design, which is a development of the True Experimental Design research design, which can be said to be challenging to implement. This research design has two classes, namely the control and experimental classes, but the control classes are not used optimally. The Quasi-Experimental Design used in this study is the Nonequivalent Control Group Design. This design is almost the same as the pretest-posttest control group design. Only in this design were the experimental and control groups not randomly selected (Sugiyono, 2018). So in this design, the posttest is held so that the treatment results can be known more accurately because they can compare with the situation after the pretest is had.

The data collection techniques in this study used a test technique. The test is used to measure students' critical thinking skills. The test used by the researcher is a written test. The test was given as a first step for the experimental class before giving treatment (pretest) and after the researcher gave treatment or treatment after the usual learning was completed (posttest). The test questions given are ten questions in the form of essay questions. The questions depart from the grid and refer to the basic competency standards taught and learned by students. Before the test questions were given previously, they were tested to determine the validity, reliability, level of difficulty, and discriminatory power. Data analysis techniques were carried out after data collection was completed and all data had been collected. Data analysis techniques in quantitative research are used to answer the hypotheses that have been proposed.

RESULT AND DISCUSSION

The data obtained from the beginning to the end was obtained by giving a pretest to students before receiving treatment using an environmental approach and offering a posttest to students after being given treatment (the application of an

environmental approach). The questions given at the pretest and posttest are questions to measure critical thinking skills with predetermined indicators. Before the questions were given, the validity, reliability, discriminatory power, and difficulty level were tested. After that, the resulting data will be analyzed using a hypothesis test, namely the t-test. Furthermore, the initial data came from the results of the pretest of science questions which were previously taught by the teacher using the lecture method and the discussion method in science subjects. The initial data obtained by the researcher is used to determine whether the data is normally distributed or not through the class used for research.

Table 1. Exposure to Initial Student Data

Criteria	Preliminary Data
Number of Samples	35 Students
Standard Deviation	8,87
Variants	78,66
Minimum	40,00
Maximum	75,00
Average	54,85
Category	Sufficient

Initial data processing was carried out with the help of Ms. Excel, based on the data obtained showed that the sample used for the study was 35 students. The standard deviation was 8.87, with a variance of 78.66. the minimum value of 40.00, the maximum value of 75.00, and the average score is 54.85, so the data is included in the sufficient category.

The final data was obtained through a critical thinking ability test given to students after treatment. The results that have been received are processed to test the hypothesis. The critical thinking ability test data are presented as follows.

Table 2. Exposure to Final Data Student

Criteria	Final Data
Number of Samples	35 Students
Standard Deviation	10,92
Variants	119,24
Minimum	60,00
Maximum	100,00
Average	76,15
Category	Good

It Manages the critical thinking ability test data is done with the help of Microsoft Excel. The data shows the research on fifth-grade students with a sample of 35 students obtained a standard deviation of 10.92 and a variance of 119.24. a minimum value of 60.00, a maximum value of 100.00, and an average of 76.15 are included in the good category.

The results of the student's critical thinking ability test scores obtained data in the good category. Based on the tests carried out, after being given treatment or treatment and a change in the use of the method on student scores. The research results obtained from data analysis describe the research that has been carried out. The research data obtained were then analyzed to interpret the combined data and, at the same time, answer the research hypothesis. The following is an explanation of the results of the test instrument analysis test, initial data, and final data from the control class and experimental class being studied

After several tests have been carried out on the questions, the first is the validity test to test the validity or validity of the questions, and the second is the reliability test used to measure the constancy or consistency of the questions. The third is the discriminatory power test used to determine the ability level. Thinking on students, namely high-ability or low-ability, and the last is the level of difficulty test to determine whether the items are too difficult, difficult, moderate, sufficient, easy, or too easy.

This section will present the normality test results in the form of the lillifors test and hypothesis testing. The final data was obtained from the posttest score of the ability to solve critical thinking questions. The following is a description of the final data analysis.

The normality of the data was checked through the normality test. The normality test used the Lilliefors test, which was carried out using the SPSS program. The results can be seen in the following table and SPSS output.

Table 3. Experimental Class Final Data Normality Test

Criteria	Initial Experiment Class Data
Number of Samples	17 students
Minimum	60,00
Maximum	100,00
Average	82,35

Table 4. Experimental Class Final Data Normality Test SPSS Output

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
P0STTEST_5A	.172	17	.191	.936	17	.277

Lilliefors Significance Correction

Based on the table above, the results of the posttest final data normality output of the experimental class from a sample of 17 students obtained an average value of 82.35. From the results of the normality test of the liliefors test assisted by SPSS, the output above can be seen in the Shapiro-Wilk column because the sample is less than 50, indicating that Sig. 0.277, which is where the value of Sig. (0,277) > (0.05). If the value of Sig. > (0.05), then the data is said to be normal.

Table 5. Control Class Final Data Normality Test

Criteria	Initial Control Class Data
Number of Samples	18 students
Minimum	60,00
Maximum	80,00
Average	69,17

Table 6. Control Class Final Data Normality Test SPSS Output

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
P0STTEST_5A	.206	18	.043	.865	18	.015

Lilliefors Significance Correction

Based on the table above, the results of the normality output of the experimental class posttest final data from a sample of 18 students obtained an average value of 68.89. From the results of the normality test of liliefors assisted by SPSS, the output above can be seen in the Shapiro-Wilk column because the sample is less than 50, indicating that Sig. 0.015, which is where the value of Sig. (0.015) > (0.05). If the value of Sig. > (0.05), then the data is said to be normal.

The homogeneity test is used to collect research data and has been tested beforehand. The data distribution is normally distributed and has a homogeneous variance. The results can be seen in the following table.

Table 7. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
3.548	1	33	.068

Based on the table above, the data obtained using excel test calculations, 35 students received a Sig value of 0.068, which means the sig value is more than 0.05, and the data is declared homogeneous because it has met the homogeneity requirements.

The t-test (paired-samples t-test) was to see the effect of the ability to solve the problem-solving ability between before and after being given treatment. It can be seen in the difference between the pretest and the posttest. The following hypotheses are proposed.

H_0: There is no effect of the environmental approach on students' critical thinking skills in the fifth-grade science content of elementary school.

H_1: The environmental approach affects students' critical thinking skills in the fifth-grade science content of elementary school.

Hypothesis test uses t-test with the help of Ms. Excel with hypothesis testing criteria, if: t table t value t table then H_0 is accepted.

Table 8. Paired Sample T-test

SCombined	9,323126
T Value	4,06058
T Table	2,034515

Obtained t arithmetic = 4.06 and t table = 2.03. Because t arithmetic > t table 4.06 and t table 2.03, then H_0 is rejected, and H_1 is accepted. So, it can be concluded that there are differences in learning achievement of critical thinking skills between the experimental class using the environmental approach method and the control class using only conventional methods.

Discussion

The science content showed that students' initial critical thinking abilities were still relatively low, and students had not practiced the material directly. After being treated in the form of an environmental approach and given a final test or posttest, the average results from the posttest were 82.35. Based on the posttest

average results obtained, 82.35 (already fulfilled the minimum completeness criteria), students' critical thinking skills can be very high. This research consists of two independent variables (environmental approach) and the dependent variable (critical thinking skills). The relationship between the stimulus and the response occurs through interaction with the environment. It can be seen from the ability, the motivation from the environmental approach, and the very positive reaction of the students, indicated by an increase in critical thinking skills and scores that have met the minimum completeness criteria.

Various approaches can be used, one of which is the environmental approach. In today's era, there are still many schools that carry out the learning process only in the classroom and are less varied in the delivery of material so that most students only listen and focus on the teacher who teaches in class. Hence, students are more easily bored (Susanti & Mulyani, 2013). For example, outdoors or in the environment, both the social environment and the natural environment. Leather & Nicolis (Deringer, 2017) View outdoor education as having a goal, namely to instill an educational experience in students, which has a lot of benefits. That way, students never feel like learning outside the classroom. The environmental approach is a way to start learning by utilizing the surrounding environment as a source and teaching media. (Mustakim, 2018) an environmental approach is used in the learning process involving the environment as a learning resource. In addition to the surrounding environment as a source and learning media, students can gain a more meaningful and meaningful learning experience by applying an environmental approach to the learning process. The advantages of using an environmental approach, according to Uno et al. (Eli & Fajari, 2020) Learning activities will be more exciting and fun, and learning will be more meaningful because it is easier to understand.

The application of such an approach will have an impact on students' thinking skills. Rodiyana (Jupriyanto & Sari, 2019; Puspitasari & Rodiyana, 2019) argues that critical thinking is thinking that is accompanied by reasons and is responsible for the senses and answers that have been chosen, accompanied by evidence to support it so that conclusions can be drawn. While Paul and Elder (Shaarawy, 2014; Christina & Kristin, 2016) argue that critical thinking is an art of thinking that leads to analyzing and evaluating what exists to improve one's quality, as he puts it as follows, "the art of analyzing and evaluating thinking to improve it." Students can develop their knowledge more broadly so that the level of students critical thinking skills can develop.

This study influences the environmental approach to science content on critical thinking skills, and it is proven that students can meet the minimum completeness criteria value in science learning. Obtained t arithmetic = 4.06 and t table = 2.03. Because t arithmetic > t table 4.06 and t table 2.03, then H_0 is rejected, and H_1 is accepted. So, it can be concluded that there are differences in learning achievement of critical thinking skills between the experimental class using the environmental approach method and the control class using only conventional methods.

CONCLUSION

Teachers would be better off if they were able to use a variety of approaches to learning. They are utilizing what is available and utilizing existing learning resources to the fullest, such as an environmental approach. Student learning will be more meaningful with an environmental approach and experimenting directly.

It would be better if the teacher always understands the needs of students in learning and supervises every student activity. So that what becomes an obstacle can be appropriately resolved as well as paying attention to the condition and concentration of students so that they can take over attention and improve it when they have difficulty thinking and understanding the material.

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