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The Influence of The Environmental Approach on Five-Grade Students' Critical Thinking Ability

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Abstract

This study focuses on the influence of learning approaches on students' critical thinking skills, the lack of teacher diversity in teaching, and the utilization of learning media sources. After applying the environmental approach, the purpose was to determine the effect of critical thinking skills and minimum completeness criteria (KKM). The research design is Quasi-Experimental Design (Time Series Design). The research sample was 20 fifth-grade students at SDN Gondo 01. The pretest and posttest normality tests were normally distributed. Output SPSS pretest column sig. has a value of 0.200 > (0.05) means that the data is normally distributed. The posttest results of the SPSS output are in the sig column. The value 0.155 > (0.05) means the data is normally distributed. The paired sample t-test hypothesis test obtained sig. (2-heads) 0.000. If sig. (2-tailed) 0.000 < (0.05), then Ha is accepted, meaning that there is an influence of the environmental approach on students' critical thinking skills. The results of hypothesis testing two t-tests for one Sample obtained the results of Tcount (0.20) and Ttable (2.09). If Tcount > - Ttable, then Ho is accepted, which means that the student has fulfilled the KKM, which is 70.

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INTRODUCTION

The quality of education can be achieved if the teaching and learning process goes well, efficiently and effectively (Setyowati & Joko Raharjo, 2020). To get the next generation of good nation, quality graduates are needed, meaning that they are able to build themselves, families, communities, nations and countries (Putri et al., 2019). Various methods, techniques, and strategies are necessary for the learning process. The way that can be done to achieve learning success is by applying an approach to teaching. The approach is one element that can be applied to achieve learning success. Many kinds of approaches can be applied during the learning process. Students will encounter difficulty understanding if the strategies and approaches applied in the teaching process are inappropriate. Rest assured, in this world genuinely no stupid people; some children have not or have not had the opportunity to learn with the right teachers and methods.

The problem that teacher encounters nowadays is the use of methods in the teaching and learning process. Recently, many teachers still use conventional methods during the teaching and learning process. In addition, the learning process is mostly carried out in the room (classroom) without using other media and methods. The learning process is still teacher-centered, and the methods and approaches are still very conventional. Learning in the classroom using non-student-centered learning is not enough to understand the material. In today's era, there are not a few teachers, and almost most of the teachers who non apply student-centered learning practices and are less varied in conveying the material so that most students listen after that; they would easily forget it. An explanation is insufficient for students to understand the material, especially in elementary school. It is related to opinions (Susanti & Mulyani, 2013). Learning will be more meaningful if students can experiment, analyze and find out for themselves. Thereby, the learning experience of students will increase. It must be corrected to improve one's thinking to think more and solve a problem. It is necessary to approach the learning process according to what is needed.

In this current era, there are still many schools that carry out the learning process only in the classroom and are less varied in conveying the material so that most students only listen and focus on the teacher who demonstrates the material in the class; therefore students are more easily bored (Susanti & Mulyani, 2013). Leather & Nicholis (Deringer, 2017) views outdoor education as having a goal, namely to instill educational experiences in students, where there are many benefits, including: establishing a closer relationship with the environment, both the environment natural and social, establishing relationships among social beings, for example between students and students, and student performance can be higher. (Mustakim, 2018) the environmental approach is an approach used in the learning process with learning resources that use environmental involvement. The environmental approach is a method or strategy in teaching and learning by maximizing the use of the natural environment as a medium and source of learning. In addition to the surrounding environment as a source and learning media, the surrounding environment approach (Adela, 2019) is a learning approach that is applied with the aim of providing an orderly increase in students by utilizing the environment as a learning resource and also being able to utilize surrounding natural materials and components that are environmentally friendly too. easy to reach Students can gain a more meaningful and meaningful learning experience by applying an environmental approach in the learning process. (Ardoin & Bowers, 2020) argues that in early childhood if an environmental approach is applied to the learning process, this can increase students' appreciation and closeness to the environment and can provide more and meaningful experiences with nature. Students can gain a more meaningful and meaningful learning experience by applying an environmental approach to the learning process. In addition, students can find their own so that what is seen and tried will be easier to remember and provoke questions about the phenomenon that occurs. The environmental approach can be applied by utilizing the environment around the school in the teaching and learning process and using materials that come from the natural environment and are environmentally friendly when practicing. Teaching and learning are not continuously carried out in the classroom using blackboards, tables, and chairs, but it is better if combined with learning outside the classroom. (Eli & Fajari, 2020) learning activities will be more interesting and fun, learning

will be more meaningful because it is easier to understand and the learning experience will increase because learning is based on what is happening and linked to the surrounding environment, the materials used are easier to reach and more factual, and increase student motivation. The steps for the environmental approach (Satria, 2018): determine the topic to be studied, find something according to the topic discussed through observation or observation, classify the results of the observations, prepare reports on the results of observations, present or communicate the results of observations, reflect, carry out evaluation.

This approach is related to the principle of STEAM (Science and Technology reviewed through techniques and art, which are based on elements of mathematics) as a race where STEAM is one approach to learning that encourages students to think broadly again about all existing problems. In the real world, by combining science with art and mathematics. That way, students are expected to be able to solve existing problems, think creatively and innovatively, and bring up many ideas without any limitations so that the learning made by students will be more interesting and meaningful. One of the foundations of STEAM is the ability to think critically. In line with the opinion expressed (Henriksen, 2014), which states that the most important thing is now, the development of the times, students must be more advanced and think more broadly.

(Jupriyanto & Sari, 2019) critical thinking is the goal of education. (Christina & Kristin, 2016) critical thinking is a person's ability to solve a problem by digging up information obtained by asking oneself and being able to find a way oneself to solve the problem. (Puspitasari & Rodiyana, 2019) explained that critical thinking is thinking accompanied by reasons and being responsible for the reasons and answers that have been chosen which are accompanied by evidence to support it so that conclusions can be drawn. (Shaarawy, 2014) argues that critical thinking is an art of thinking that leads to analyzing and evaluating what exists with the aim of improving self-quality. Critical thinking skills are obtained by observing, experiencing, analyzing, generating ideas and ways to solve problems, and concluding. In this case, students are well prepared so that in the future, they can solve any existing problems accompanied by solutions. That way, students critical thinking skills will continue to develop and improve. However, at SDN Gondo 01, students still have difficulty solving high-level questions such as analyzing, distinguishing, organizing, etc. It happened because it was triggered by several factors, including the inappropriate approach used so that students were less clear in understanding the material; the learning process was very boring, so students were not interested, which caused them not to understand the material conveyed. Using an environmental approach, the teacher must balance the emphasis on results and processes in practice or experiment. In process skills, students' thinking abilities when observing until they find results and make conclusions are a way to develop students' critical thinking skills.

Students' critical thinking skills are possible if applied since elementary school age. From this, sub-indicators of necessary thinking skills must be developed, including formulating questions, giving examples, answering questions (why), writing and reporting observations, generalizing tables, data, and graphs, making conclusions, and considering alternative answers. (Anindyta & Suwarjo, 2014) states that if you want to see how far the ability of students to think can be seen in living their daily lives because someone who is a critical thinker has the characteristics of being curious, wise in acting, seeking the truth, confident in reasoning, have an open attitude, able to analyze and think systematically. (Ardiyanti and Winarti, 2013) which states that students' critical thinking skills need to be taught and developed specifically in science or science subjects.

(Henriksen, 2014) that the results of interviews with teachers who have received National awards found several key findings of success in a teaching and learning activity by applying the STEAM study. With STEAM studies, students are instantly engaged and motivated, and learning will be much more effective. The environmental approach is applied to increase students' thinking skills to be broader and able to solve a problem. Because learning is not just listening, receiving, and forgetting. However, listening, trying, asking questions, and thinking more broadly and creatively to conclude. (Afandi, 2015) said that science is theoretical knowledge that is systematically arranged and obtained specifically, namely by observing (observation) experiments,

experimenting or trying, drawing conclusions, compiling theories, experimentation, observations (observations) and so on link each other.

Critical thinking is a form of change in the learning process where a student begins to think to solve problems actively. Students' critical thinking generally starts from observing, analyzing, and determining cause and effect to drawing conclusions and asking how and why. In critical thinking, students are asked to think logically to determine what they face to solve a problem. It is in line with Reber's opinion (Syah, 2018) that in critical thinking, students should be asked to use common sense and think logically and rationally from the right cognitive perspective to discover the ideas of existing problems and how to overcome them.

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METHODS

The research design used and applied in this research is a Quasi-Experimental Design, more precisely Time Series Design. If the results are different, the group is said to be unstable or inconsistent. The pretest results are excellent and stable if $O_1 = O_2 = O_3 = O_4$. After the group's stability can be known, the group can be given treatment. After that, you can only be given a posttest four times in a row. For the period or interval, the posttest is the same as the pretest, namely, the time by the researcher himself. Good posttest results can be seen if the results are $O_5 = O_6 = O_7 = O_8$. The magnitude of the effect of the treatment can be seen by $(O_5 + O_6 + O_7 + O_8) - (O_1 + O_2 + O_3 + O_4)$ (Sugiyono, 2018).

The population used in this study was class V SDN Gondo 01, totaling 21 students. In this study, the sampling technique used was the Non-Probability Sampling technique, more precisely, the Systematic Sampling. In determining and selecting the number of samples that will be used for research, a representative can use the Slovin formula, and the results obtained are a sample of 20 students. The formula can be seen as follows:

$$n = \frac{N}{(N\,(d)^2 + 1)}$$

description
n is Sample
N is Population
d is 95% precision value or sig. = 0.05

Data collection techniques applied in this study were test techniques, such as description questions, to measure critical thinking skills, and non-test techniques, such as documentation and interviews. The instrument trial was tested for reliability, validity, difficulty level, and discriminatory power with the help of Ms. Excel.

The statistical test to test the first hypothesis used the paired sample t-test to determine the effect of the environmental approach on critical thinking skills in the science content of fifth-grade elementary school students who were previously tested for normality or normalization with a significant level of 0.05. To determine whether students' critical thinking skills through an environmental approach to the science content of fifth-grade elementary school students, a one-sample t-test was carried out, which had previously been tested for normality with a significant level of 0.05.

RESULTS AND DISCUSSION

Data collection from start to finish is obtained in two ways. The first is giving a pretest to students before being given treatment by applying an environmental approach, and the second is giving a posttest after being given treatment (implementation of an environmental approach) to students. The questions given in the pretest and posttest are questions to measure critical thinking skills with certain indicators. It aims to answer the formulation of the problem: 1) The effect of the environmental approach on students' critical thinking skills, and 2) Achievement of KKM after applying the environmental approach.

The effect of the environmental approach on students' critical thinking skills can be seen from the differences before and after the application of the treatment. It can be seen from the pretest one and posttest four results, which were tested with the SPSS-assisted paired sample t-test. After obtaining the initial data through four pretests from a sample of 20 students and processing them, the results of the first pretest averaged 38.00, the variance was 95.78, and the standard deviation was 9.78. From the second pretest, the average result was 38.50, the variance was 87.10, and the standard deviation was 9.33. From the three pretests, the average result was 38.00, with a variance of 106.31 and a standard deviation of 10.31. And from the four pretests, the average result was 38.75, with a variance of 162.82 and a standard deviation of 12.76. As for the final data through the posttest four times from the same Sample and processed, the results obtained from posttest one with an average of 70.75, a variance of 205.98, and a standard deviation of 14.35. From the second posttest, the average result was 70.25, the variance was 269.67, and the standard deviation was 16.42. From the third posttest, the average result was 70.50, the variance was 226.05, and the standard deviation was 15.03. And from the four posttests, the average result is 70.75, the variance is 278.68, and the standard deviation is 16.69.

From the initial data processing, the pretest results were processed with the help of SPSS from a sample of 20 students. The average pretest one was 38.00, pretest two was 38.50, pretest three was 38.00, and pretest four was 38.75. And from the final data processing, the results of posttest one were processed with the help of SPSS from a sample of 20 students. The average posttest one was 70.75; posttest two was 70.25. Posttest three was 70.50. Posttest four was 70.75. The effect or difference before and after the treatment application can be seen from the pretest one and posttest four results, which were tested with the SPSS-assisted paired sample t-test. The hypothesis testing that has been done also shows whether there are differences in students' critical thinking abilities before and after the environmental approach is implemented. It can be proven through the paired sample t-test from the results of pretest one with an average of 38.00 and posttest four with an average of 70.75 assisted by SPSS, which previously determined the criteria in the test, namely if sig. (2-tailed) < = 0.05, then Ho is rejected.

SPSS output result sig column. (2-tailed) i.e., the result is 0.000. On the criteria that have been determined, namely, if sig. (2-tailed) < = 0.05, then Ho is rejected. Based on the results obtained, it can be concluded that sig (2-tailed) 0.000 < = 0.05, then Ho is rejected, and Ha is accepted. A graph also supports the results showing that the pretest and posttest differ significantly from the processing and output data results. The results of the study showed that there was an increase in the average obtained by students from pretest one and pretest four. The first pretest brought an average of 38.00, and the fourth posttest received an average of 70.75. So, it can be concluded that the results of the pretest and posttest that have been obtained show a difference before and after applying the environmental approach. That way, the environmental approach influences students' critical thinking skills in grade V elementary school science material.

One Sample t-test statistical test to examine the second hypothesis, namely the average learning completeness per individual in solving critical thinking skills questions on the science content of class V SD on heat transfer material with minimum completeness criteria 70. The test questions used in the pretest (before being given treatment) and posttest (after being given treatment) to measure students' critical thinking skills covered three indicators, those are analyzing which are included in operational verbs at level C4, clarifying, which formed in level C5, and generalizing which is included in level C6. Based on the results obtained between the pretest and posttest are very much different, where the pretest results obtained an average of 38.00, and the posttest results obtained an average of 70.75. The pretest results showed that students' critical thinking skills were still deficient. The average results were relatively high after being treated and given a posttest with the same indicators.

One sample t-test statistical test assisted by Ms. Excel with criteria Tcount > -Ttable then Ho is accepted and vice versa if Tcount < -Ttable then Ha is accepted. From the calculation results, Tcount obtained the results of 0.20, and Ttable obtained the results of 2.09 (-Ttable = - 2.09). Thus, relying on predetermined criteria, namely, if the calculation results are obtained Tcount > -Ttable, then Ho is accepted, and vice versa. If Tcount < -Ttable, then

Ha is accepted. From this, it can be concluded that Tcount (0.20) > -Ttable, Ho is accepted, and Ha is rejected. That way, it can be concluded that students' critical thinking skills through an environmental approach to the science content of fifth-grade elementary school students have met the Minimum Completeness Criteria (KKM).

In the 2013 curriculum, students must be more active and able to properly maximize the use of media and learning resources. Good learning is when students can play an active role while the teacher is only a facilitator. It is in line with John Piaget's theory which states that knowledge must be holistic in which all existing components, including physical, mental, and mental, must be involved. That way, automatically, students will be more active in the teaching and learning process and make the learning process more meaningful and easy to remember so that the student's learning experience will be more meaningful. It is very influential on students' ability to think critically. Before applying the environmental approach, students can be said to have not been able to solve critical thinking questions correctly, with an average achievement of 38.00 with questions with indicators C4, C5, and C6 (Analyzing, Evaluating and Creating) creating where the indicators are loaded based on Taxonomy theory Bloom. After implementing the environmental approach, utilizing the natural environment and surroundings, the result shows that the student can solve critical thinking skills well with the same indicator with an average score of 70.75. Consequently, it can be concluded that the environmental approach affects students' critical thinking skills.

CONCLUSION

Research results In the pretest, the average results of students' critical thinking skills were 38.00, and after being given treatment, the average posttest results increased to 70.75. So it can be concluded that the environmental approach influences students' critical thinking skills in grade V elementary school science material. It is evidenced by the sig (2-tailed) data processing output of 0.000 < = 0.05.

After applying the environmental approach, the critical thinking skills of fifth-grade elementary school students were able to meet the Minimum Completeness Criteria (KKM) 70, as evidenced by Tcount (0.20) > - Ttable (-2.09).

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REFERENCES

Adela, D. (2019). Pendekatan Lingkungan Sekitar Sebagai Basis pembelajaran Untuk Mengembangkan Sikap dan Nilai Dalam Pembelajaran IPS. *BELAINDIKA*, 26-33.

Afandi, M. (2015). *Evaluasi Pembelajaran Sekolah Dasar.* Semarang: UNISSULA Press.

Afni, N., Putri, F., & Hasyim, B. A. (2019). Penerapan Model Pembelajaran Tipe SAVI Pada Pembelajaran Gambar Teknik Penerapan Model Pembelajaran Tipe Savi Pada Pembelajaran Gambar Teknik Untuk Meningkatkan Hasil Belajar Siswa Kelas X Tpm Di Smkn 1 Kalitengah Lamongan.

Anindyta, P., & Suwarjo. (2014). Pengaruh Problem Based Learning Terhadap Keterampilan Berpikir Kritis dan Regulasi Diri Siswa Kelas V . *Prima Edukasia*, 210-222.

Ardiyanti, F., & Winarti. (2013). Pengaruh Model Pembelajaran Berbasis fenomena Untuk Meningkatkan Keterampilan Berpikir Kritis Siswa Sekolah Dasar. *Kaunia*, 27-33.

Ardoin, N. M., & Bowers, A. W. (2020). Early childhood environmental education: A systematic review of the research literature. *Educational Research Review*.

Christina, L. V., & Kristin, F. (2016). Efektivitas Model Pembelajaran Tipe Group Investigation (GI) Dan Cooperative Integrated And Composition (CIRC) dan Hasil Belajar IPS Siswa Kelas 4. *Sholaria*, 217-230.

Deringer, S. A. (2017). Mindful Place-Based Education: Mapping the Literature. *Journal of Experimental Education*, 1-16.

Eli, W., & Fajari, L. W. (2020). Penerapan Pendekatan Lingkungan Alam Sekitar (PLAS) untuk Meningkatkan Motivasi

Belajar dan Hasil Belajar Siswa Kelas V Sekolah Dasar. *Studi Guru dan Pengembangan*, 58-66.

Henriksen, D. (2014). Full STEAM Ahead: Creativity in Excellent STEM Teaching Practices. *The STEAM Journal*.

Jupriyanto, & Sari, Y. (2019). The Student Critical Thinking Skills On Science Learning Subject At 5th Grade In Inquiry Learning. *JPSD*, 127-136.

Mustakim, Z. (2018). *Strategi Dan Metode Pembelajaran.* Yogyakarta: Metagraf.

Puspitasari, W. D., & Rodiyana, R. (2019). Bahan Ajar Inquiry Saintifik untuk Berpikir Kritis Siswa Sekolah Dasar. *CAKRAWALA PENDAS*, 195-202.

Satria, E. (2018). Pendekatan Lingkungan Dengan KIT IPA SEQIP Untuk Peningkatan Keterampilan proses Ilmiah dan Hasil Belajar Kognitif Siswa. *AKRAB JUARA*, 40-60.

Setyowati, D., & Joko Raharjo, T. (2020). The Effectiveness of Concept Mapping on Social Skills of Students in Social Learning of Elementary School Article Info. *Journal of Primary Education*, *9*(1), 16–24. https://doi.org/10.15294/jpe.v9i1.28238

Shaarawy, H. Y. (2014). The Effect of Journal Writing On Students Cognitive Critical Thinking Skills. *International Journal of Higher Education*, 120-128.

Sugiyono. (2018). *Metode Penelitian Pendidikan.* Bandung: Alfabeta.

Sundayana, R. (2016). *Statistika Penelitian Pendidikan.* Bandung: ALFABETA.

Susanti, N. D., & Mulyani. (2013). Memanfaatkan Lingkungan Sekitar Sebagai Sumber Belajar Dengan Tema Lingkungan Untuk Meningkatkan Hasil Belajar Siswa Kelas III Sekolah Dasar . *JPGSD*, 1-11.

Syah, M. (2018). *Psikologi Pendidikan.* Bandung: PT Remaja Rosdakarya Offset.