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The Effect of 5-E Inquiry-Based IPAS Learning on Critical Thinking Skills and Process Skills of Students of SDN 3 Kalibombong

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ABSTRACT

This study aims to determine the effect of IPAS learning to improve students' critical thinking ability and process skills. The type of research used is descriptive quantitative. This research uses a 5-E based inquiry learning model. The 5-E inquiry approach is a learning approach that is oriented towards student activeness. The discussion in this study discusses the implementation of critical thinking and process skills in the realm of Natural Science subjects. The sample of this study were fourth grade students of SDN 3 Kalibombong, totaling 22 students. The data collection techniques used were tests, questionnaires, field notes and documentation. The research data were processed using a simple linear regression test with the results for the effect of 5-E Inquiry-based IPAS learning on critical thinking skills tcount of 4.044> ttable 2.086, meaning tcount> ttable.For the effect of 5-E Inquiry-based IPAS learning on process skills 5.184> ttable 2.086, meaning tcount> ttable. Based on the results of this study, it shows that there is an effect of 5-E Inquiry-based IPAS learning on critical thinking skills and process skills of fourth grade students of SDN 3 Kalibombong in the 2024/2025 academic year.

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1. INTRODUCTION

The demands and challenges of the times require educational institutions to be able to print and form a generation that is able to compete in the era of globalization [1]. The generation in this case is students who must be equipped with the ability to understand content, information and communication. These students' skills and abilities will be the solution to problems in the fields of science and technology, the world economy and global environmental problems [2]. The shift from the 2013 Curriculum to the Merdeka Curriculum brings many changes both in essence and technically.

The Merdeka Curriculum is a curriculum with diverse intracurricular learning where content will be optimized so that students have enough time to explore concepts and strengthen competencies [3]. Teachers have

[1] Amadi, A. S. M. (2022). *Pendidikan di Era Global: Persiapan Siswa untuk Menghadapi Dunia yang Semakin Kompetitif*. Education: Jurnal Ilmu Pendidikan., Vol.17, No.2, Desember 2022, Hal 153-164
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[3] Barlian, U. C., Solekhah, S., & Rahayu, P. (2022). *Implementasi Kurikulum Merdeka dalam Meningkatkan Mutu Pendidikan*. Journal of Education and Language Research (JOEL); Vol.1, No.12, Juli 2022; 2105

the flexibility to choose various teaching tools so that learning can be tailored to students' learning needs and interests. In the 2013 curriculum, science subjects stand alone. Meanwhile, in the Merdeka Curriculum, science and social studies subjects are integrated into one and changed their name to IPAS. Learning Outcomes is a term in the Merdeka Curriculum that explains the minimum competencies that students must achieve in each subject received at each phase of development.

In the first year of implementing the Merdeka Curriculum at the elementary school level, it was implemented in grades 1 and 4. The number of studies contained in science is something that is difficult for most students to understand. Whereas science is very necessary, because with science students can better know, understand, experience, feel, and find a concept with the potential for prior knowledge owned by students [4]. Students' prior knowledge is very important in learning, because this can help students understand a science concept to be learned.

Prior knowledge possessed by students can be used as an initial capital in connecting learning concepts with students' initial conceptions. With the combination of prior knowledge with the science concepts taught, it is expected to provide a positive value to the success of science learning in the classroom. Science learning is closely related to everyday life, because in everyday life students can know and experience firsthand everything that happens in nature. However, what students know is the initial concept, not the concept that is in accordance with the Learning Outcomes and Learning Objectives.

The main role of the teacher in science learning is to bring up or stimulate various contextual problems that exist in everyday life and help students become independent learners. The teacher acts as a facilitator focusing on the scientific procedure approach related to science learning. In addition, teachers present problems and help direct investigations to find solutions to these problems. An innovative learning model is needed in order to lead students to achieve better learning outcomes. The inquiry learning model is used as a solution because this model is a series of lessons that emphasize the critical and analytical thinking process to seek and find answers to questionable problems [5].

Inquiry learning will be effective if students can find their own answers to the problems they want to solve. The 5E type inquiry model is a model previously reconstructed by researchers with various supporting theories as a reinforcement for model reconstruction. This model is a combination of the inquiry model and the 5E model (Engage, Explore, Explain, Elaborate and Evaluate). The inquiry learning model is a learning model that prioritizes the activeness of students in finding concepts based on the problems posed so that it can be used as a learning experience [6]. This 5E learning cycle model is a more appropriate and effective tool in achieving indicators of critical thinking skills [7].

The first thing to do is to provide problems that must be solved by students, if students have difficulty, the teacher provides guidance gradually so that the actual abilities of students become potential abilities. Instructions, warnings, encouragement, breaking down the problem into solution steps or providing examples are forms of assistance directed by the teacher [8]. Judging from the many advantages that exist in the 5-E inquiry-based learning model, this learning model is used as an alternative to solving problems that occur at SDN 3 Kalibombong.

The 5 E inquiry-based learning model is expected to be able to solve the problems of teacher performance, student activity and learning outcomes on the material of magnetic properties. Based on these problems, a learning model that can teach active and creative students can also find their own concepts that develop positive attitudes and can improve students' critical thinking skills. In science learning, it is very necessary for students' critical thinking skills to be able to solve problems found in conducting an experiment. The fact that critical thinking in science learning is still low and needs to be developed.

The low critical thinking of students is because the learning process is still dominated by memorization so that it has an impact on learning outcomes. Low learning outcomes indicate that students' critical thinking skills are still low as well [9]. Therefore, teachers are obliged to help students develop their critical thinking skills needed to solve a problem. In addition, students' process skills are still very low. Teachers only pursue subject matter without caring about the development of students' process skills in learning. Referring to the above

[4] Nahdiyah, I., Mulyasari, E., & Djumhana, N., (2019). *Model Inkuiri pada Pembelajaran IPA untuk Meningkatkan Keterampilan Proses Sains Siswa SD*. Jurnal Pendidikan Guru Sekolah Dasar (JPGSD); Vol.4, No.II, Agustus 2019, hlm 304-311

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problems, the purpose of this study is to identify the effect of E 5 inquiry-based IPAS learning on critical thinking skills and process skills of fourth grade students of SDN 3 Kalibombong.

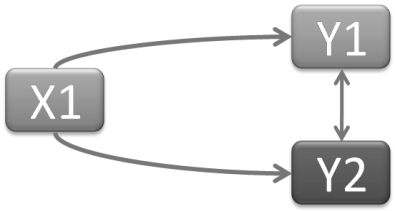
2. METHOD OF THE RESEARCH

The method used in this research is descriptive quantitative. The sample of this study were fourth grade students of SDN 3 Kalibombong, Kalibening District, Banjarnegara Regency. The sample used is class IV of SDN 3 Kalibombong which consists of 22 students, 15 male students and 7 female students. The data collection techniques used were tests, questionnaires, field notes and documentation. The purpose of this study was to identify the effect of IPAS learning based on inquiry-5 E on students' critical thinking and creative thinking skills.

The research was conducted in class IV of SDN 3 Kalibombong, 2024/2025 academic year which is located in Kalibombong Village, Kalibening District, Banjarnegara Regency. The research was conducted in April 2024. This research is a quantitative approach, which is an associative research type, or is research that aims to determine the relationship between two or more variables [10]. Researchers try to describe the current conditions in a quantitative context that is reflected in the variables. The type of research used is in accordance with the objectives to be achieved, namely to determine the effect of 5-E inquiry-based IPAS learning on critical thinking skills and process skills after applying the inquiry learning model with a 5-E approach.

The population of this study were all students of SDN 3 Kalibombong in the 2024/2025 academic year, totaling 168 students consisting of classes I to VI. The sampling technique used was purposive sampling technique. The purposive sampling technique is the determination of samples from the entire population with certain considerations, and to determine the sample, namely based on recommendations from teachers. The sample is a part or representative of the population under study. The sample in this study was class IV totaling 22 students. The following is the research paradigm used, which is a double paradigm with two dependent variables [11]. The picture is as follows.

Figure 1. Dual Research Paradigm



Description:
X1 : Independent variable / free
Y1: Dependent / dependent variable 1
Y2: Dependent / dependent variable 2
r1, r2: Simple correlation

The data collection technique used by the author in this study is expected to be able to provide accurate and more specific data, while the data collection technique used is to use an assessment rubric. The data obtained from the results of data collection must be tested before continuing to test the hypothesis.

a. Hypothesis Test

The hypothesis test used is simple linear regression analysis to determine the effect between the independent variable and the dependent variable. This simple regression selection is to identify the effect of the 5-E inquiry learning model (X) on critical thinking skills (Y1) and the 5-E inquiry learning model (X) creative thinking skills (Y2). Calculation of simple linear regression test is analyzed using SPSS 25 for windows. Criteria for acceptance and rejection of the hypothesis if: 1) ttabel < tcount, or significant ≤ 0.05 then the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted.

This means that there is a significant influence between one independent variable on the dependent variable. 2) ttabel > tcount, or significant ≥ 0.05 then the null hypothesis (H0) is accepted and the alternative hypothesis (Ha) is rejected. This means that there is no significant influence between one independent variable on the dependent variable.

[10] Sugiyono. (2022). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
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3. RESULTS AND DISCUSSIONS

Hypothesis testing in this study uses simple linear regression to determine the effect of the influence of the independent variable on the dependent variable with the following equation Y = a + bx. The criteria for accepting the hypothesis is if ttabel < tcount, or significant ≤ 0.05 then the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. This means that there is a significant influence between one independent variable on the dependent variable.

a. Hypothesis 1 Analysis

Hypothesis 1 in this study is as follows.

- H0: μ1 = μ2 There is no effect of IPAS learning based on 5-E Inquiry on critical thinking skills of fourth grade students of SDN 3 Kalibombong.
- H1: μ1 ≠ μ2 There is a significant effect of IPAS learning based on 5-E Inquiry on critical thinking skills of fourth grade students of SDN 3 Kalibombong.

Through a simple linear test, the results obtained as presented in tables 2 and 3 below.

Table 1. Regression Test Output (Model Summary)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.671[a]	.450	.422	1.69761
a. Predictors: (Constant), 5-E Inquiry				

Table 2 shows the value of the correlation / relationship (R) which is 0.671. From this output, the coefficient of determination (R Square) is 0.450 which implies that the effect of the independent variable (5-E Inquiry) on the dependent variable (Critical Thinking Skills and Process Skills) is 45%, and the influence of other factors is 55%.

Table 2. Regression Test Output (Coefficients)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.208	4.000		2.552	.019
	Inkuiri 5-E	.692	.171	.671	4.044	.001
a. Dependent Variable: Critical Thinking						

Based on the significance value of the Coefficients table, the significance value is 0.001 <0.05 so it can be concluded that the 5-E Inquiry variable (X) AFFECTS the Critical Thinking variable (Y1). Based on the t value of the t value of 4.044> t table 2.086 so it can be concluded that the 5-E Inquiry variable (X) AFFECTS the Critical Thinking variable (Y1).

b. Hypothesis 1 Analysis

Hypothesis 2 in this study is as follows:

- H0: μ1 = μ2 There is no effect of IPAS learning based on 5-E Inquiry on the process skills of fourth grade students of SDN 3 Kalibombong.
- - H1: μ1 ≠ μ2 There is a significant effect of IPAS learning based on 5-E Inquiry on the process skills of fourth grade students of SDN 3 Kalibombong.

Through the simple linear test, the results are presented in tables 4 and 5 below.

Table 3. Regression Test Output (Model Summary)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757[a]	.573	.552	.48643
a. Predictors: (Constant), 5-E Inquiry				

The table above shows the value of the correlation / relationship (R) which is 0.757. From this output, the coefficient of determination (R Square) is 0.573 which implies that the effect of the independent variable (5-E Inquiry) on the dependent variable (Process Skills) is 57.3% and the influence of other factors is 42.7%.

Table 5. Regression Test Output (Coefficients)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.230	1.958		7.269	.000
	Inkuiri 5-E	.437	.084	.757	5.184	.000
a. Dependent Variable: Process Skills						

Based on the significance value of the Coefficients table, the significance value is 0.000 <0.05 so it can be concluded that the 5-E Inquiry variable (X) AFFECTS the process skills variable (Y2). Based on the t value of the tcount value of 5.184> t table 2.086 so it can be concluded that the 5-E Inquiry variable (X) AFFECTS the Process Skills variable (Y2).

4. CONCLUSIONS

Based on the results of research and data analysis using simple linear regression techniques that have been carried out in this study, it can be concluded: 1. There is a significant effect of 5-E Inquiry-based IPAS learning on critical thinking skills of fourth grade students of SDN 3 Kalibombong Banjarnegara in the 2024/2025 school year. The magnitude of the influence of 5-E Inquiry-based IPAS learning on critical thinking skills is 45%, and the influence of other factors is 55%. 2. There is a significant effect of 5-E Inquiry-based IPAS learning on the process skills of fourth grade students of SDN 3 Kalibombong Banjarnegara in the 2024/2025 school year. The magnitude of the influence of 5-E Inquiry-based IPAS learning on process skills is 57.3%, and the influence of other factors is 42.7%.

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