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ENHANCEMENT STUDENTS' CRITICAL THINKING SKILLS IN SCIENCE LEARNING THROUGH AN INDEPENDENT CURRICULUM

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ABSTRACT

The low level of students' critical thinking skills is due to the fact that in the learning process students are not trained to think critically. This research has objectives including 1) Analyzing students' critical thinking skills in science lessons in grade 4, 2) knowing the application of the independent curriculum in science lessons in grade 4, and 3) knowing the inhibiting factors and supporting factors in improving students' critical thinking skills in science lessons in grade 4. This research method is mixed methods with a concurrent triangulation model. The sample used, namely class 4B students with a total of 44 students. Quantitative data collection techniques were tests. Meanwhile, qualitative data collected through observations, interviews, and documentations. The results obtained show that students' critical thinking skills after application of an independent curriculum science lessons in class 4 have increased which is indicated by the increase in the average value of students' posttests worth 87,86. The result paired sample t-test, show sig (2-tailed) value of 0.000 <0.05. So, this shows that there are differences in students' critical thinking skills before and after the implementation of the independent curriculum in science lessons in grade 4 SDIT Baitussalam. Thus, it can be concluded that the implementation of an independent curriculum in science lessons can improve students' critical thinking skills because in the learning process activities students' critical thinking skills continue to be trained every day through question and answer activities and answering questions.

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1. INTRODUCTION

Learning activities today, especially in the digital era with advances in science and advancement, this is very influential in 21st century learning activities. Learning in the 21st century has changed from teacher centered learning to student centered learning. The skills required for the 21st century is known as 4C skills. Meilaini argues that the 4C skills in learning in the 21st century consist of critical thinking, creativity thinking, communication skills, and collaboration skills (Nopiani et al., 2023). In this case, the learning process activities need to apply the 4C skills consistently.

One of the skills needed to deal with technological and scientific developments in the 21st century is the ability to think critically thinking. Critical thinking skills are also according to improving quality in educations as stated an independent curriculum. These are supports the results a research by (Mobonggi, A & Hakeu, 2023) which concluded implementing an independent curriculum improves quality of education. Curriculum independence is a curriculum which makes the lesson activities simpler, flexible, active, and focused on essential material. According to Khoirurrijal, an independent curriculum is one that is designed with greater diversity and students more opportunities so that learning process activities can run smoothly, especially in exploring knowledge (Rahmawati et al., 2023). Sartini & Mulyono (2022) also explain that an independent curriculum a curriculum including extracurricular, extracurricular, learning activities, and there is a Pancasila learner profile with a variety of optimized information. It is intended for students having enough time to understand a concept and its competency. In implementing an independent curriculum, there are several characteristics including skill and personality development, focus on essential materials, and flexible learning activities (Nafi'ah et al., 2023). Based on this, the implications of an independent curriculum are in accordance with the Decree of the Minister of Education, Culture, Research and Technology Number 56 / M / 2022 regarding guidelines for Curriculum Implementation in the Framework of Learning Recovery (Sahnan & Wibowo, 2023).

Learning activities in the independent curriculum aim to develop student character through the Pancasila learner profile. The Pancasila learner profile is divided into 6 dimensions, including piety, faith in God Almighty, and noble character; global diversity; mutual cooperation; independence; critical reasoning; and creativity (Kementrian Pendidikan, Kebudayaan, Riset, 2022). In the profile of Pancasila students, one of them is critical reasoning. Critical reasoning is part of a person's ability that requires logical thinking and prioritizes logic in thinking. According to Schafersman, critical thinking is the ability to ask questions, gather appropriate news, organize information appropriately and innovatively, reason logically, and draw conclusions (Ramadhania & Saputro, 2023). Critical thinking it's required skill that learners should have in the learning process. Thinking ability in students must be trained continuously in learning activities so that students are able to develop their thinking skills in everything, especially in making decisions (Janah et al., 2024). Meanwhile, critical thinking, according to Ennis is an ability that focuses on making decisions about something that must be convinced and that must be carried out (Juraidah & Hartoyo, 2022). To realize the profile of Pancasila students, which includes Pancasila students who have critical thinking, then students must have this ability. The ability to develop critical thinking skills can provide enormous benefits for students. Arifin Nugroho argues that the benefits of critical thinking skills in students, can improve student learning outcomes, increase achievement in school, increase motivation, and increase positive attitudes (Zakiah & Ika, 2019).

During teaching and learning activities, critical thinking skills are trained in various ways, such through conducting experiments, making discoveries, solving problems, and conducting group discussions between students. Natural science means one of the subjects that does a lot of experiments, discoveries, problem solving, and discussions. Nurmala et al (2021) state that science subjects are science subjects that focus more on the process than the results. This can provide students with the opportunity to develop their abilities. According to (Ardhani et al., 2021) natural science is a science that investigates natural phenomena based on human experiments and observations. The science learning process activities must involve students so that students become active, have high curiosity, train critical thinking, and help students when making a decision.

However, the fact is that science learning activities have not fully developed students' critical thinking skills, which can result in students' knowledge lacking development.

Student's abilities in thinking critically are not optimally developed because in learning process activity students less directly engaged, so that students only receive material, do not dare to ask questions, and do not dare to express opinions. In learning processes activities at class, student is less directly involved because the activities are still focused on the teacher so that it can hinder the development of students' critical thinking skills. This is in line with the research of (Rosmalinda et al., 2021), that learning that is still focused on the teacher, results in students not being directly involved so that students critical thinking ability are not optimal. Learning process activities that do not hone students critical think ability can cause a decrease student critical think ability. Therefore, according to the PISA outcome, it shows that the critical thinking skills and abilities of students in Indonesia are still below the average. Based on the results of the assessing science skills conducted by the PISA team in 2018, Indonesia still ranks 74 from 79 participating with a score of 396 (Utama & Kristin, 2020).

Based on the results of observations carried out by researchers in class 4 SDIT Baitussalam, the low critical thinking ability of students is due to the learning process activities still focused on the teacher. As a result, students are less trained to think critically, especially in asking questions and expressing opinions during learning activities. The low ability for critical thinking students is due to the perception of students who still consider science subjects as difficult subjects. This is in accordance with research (Maslakhatunni'mah et al., 2019) showing that there are 40% of students who consider science subjects are difficult subjects. The next problem is that teachers still use conventional learning models that are dominated by lectures. This is in line the results of a study by (Lukitasari et al., 2019) confirmed that conventional lesson models can cause students critical reasoning abilities to be low as indicated by a lower posttest average value of 12.61 compared to learning using problems-based lesson models which resulting average posttest value of 14.08. Based on this, teachers must use various lesson models for students can practice thinking critically.

Efforts can be made, especially to improve the critical thinking skills of grade 4 students in science lessons at SDIT Baitussalam, namely by implementing an independent curriculum and training student critical think ability specifically in science lessons. In the independent curriculum, learning activities are students centered and can indirectly train students' critical thinking skills. These aligned with findings that has been conducted by (Annam et al., 2024) that through applying an independent curriculum, students' critical thinking skills increased from 75% of students who had a categories good in cycle I to very good categories in cycle II to 85%.

Based on previous research that has been conducted, learning activities are still teacher-centered which causes students to only take notes and listen to the teacher's explanation so as not to think critically student, especially asking or answering questions. In addition, previous studies used quasi-experimental research methods. Based on this, the novelty of this research lies in the research method because the research method that will be used in this study is a mixed method. In addition, previous research in improving students' critical thinking skills was carried out by applying varied learning models. However, in this study, the way to improve students' critical thinking skills is through the application of an independent curriculum in science lessons. With the emergence of existing problems, this research needs to be carried out at SDIT Baitussalam. This was in line with the observation outcomes that there are problems that exist in grade 4 SDIT

Baitussalam which result in low critical thinking skills in students, so that the results of the research produced later can provide solutions to the problems that occur.

2. METHOD

The research uses are a mixed method. According to Cresswell, that mixed methods is an approach in research that combines two research method between quantitatively method and qualitative method (Sugiyono, 2023). This study will use a research design with a concurrent triangulation model. The following research design (Figure 1) will be carried out:

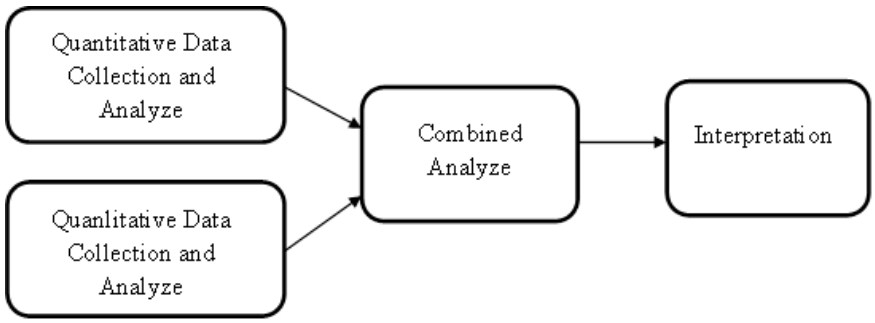

Figure 1. Research Design Concurrent Triangulation

Based on Figure 1. that in the concurrent triangulation model, quantitative and qualitative data are collected simultaneously at the same time. After that, if quantitative data is collected, it will be analyzed quantitatively and if qualitatively data is collected, it will also be analyzed qualitatively. Furthermore, the results quantitatively and qualitatively were combined to be analyzed together to find the relationship whether the two data strengthen, complement, deepen, expand, or contradict each other. This research will be conducted at SDIT Baitussalam, Bogor Regency, in semester 2 of the 2023/2024 school year which takes place from March to May 2024. Grade 4B students at SDIT Baitussalam consisting of 44 students were part of the populasi of the study. The sample used is full of grade 4B with a total of 44 students. A sample technique was adopted, namely non-probability sampling using purpose sampling type.

Quantitative data collected through a test and qualitative data collected through observations, interview, and documenting. These instruments were test sheets of descriptive questions, observing papers, and interview paper. Before being used, the description test questions will be tested for validity and homogeneity. After the validity test check, there are 19 valid items. The test that will be given to students has 19 items of description. A quantitative data analyzing technic using t test and qualitative data analyzing technique uses the Miles and Huberman model. The reason for using mixed methods is because it wants to explain the phenomenon under study comprehensively so that quantitative data will be complemented by qualitative explanations so that the data obtained is more complete, correct, credible, and rational. In this case, based on the results of studies conducting by (Hendrayadi et al., 2023) combining quantitative and qualitative methods to produce a more complete and in-depth picture of the phenomenon under study. Before the t test, precondition is conducted normality and homogeneity tests on pretest and posttest data. After that, analyze the data using the t test. The t test used is paired sample t-test using the SPSS Statistics 26 for Windows application.

3. RESULTS AND DISCUSSION

The study showed a differences critical thinking skills of student before and after applying an independent curriculum in science lessons in grade 4 SDIT Baitussalam. This is evidenced the increasing mean score of students' critical thinking skills posttest. An enhancement in students' critical thinking skills in science lessons through independent curriculum get it observed from the mean score of prettest to posttest. The increase in mean scores student's critical thinking abilities is presented this diagram in Figure 2 as follows:

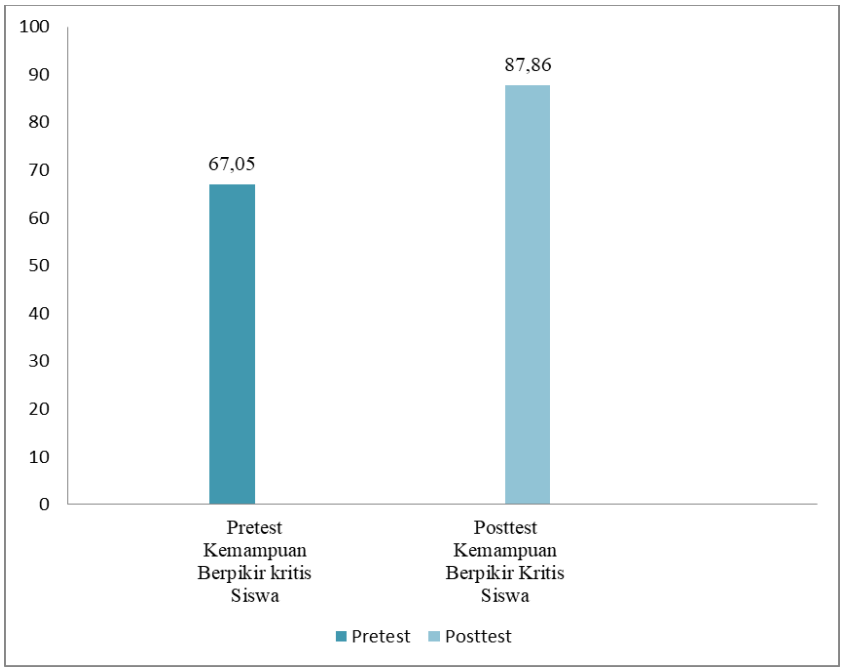

Figure 2. Diagram Average Pretest and Posttest

Based on Figure 2, the pretest value shows a mean of 67,05 and the posttest value shows an average of 87,86. In this case, after implementing an independent curriculum, students' critical thinking abilities science lessons in class 4 have increased with a mean posttest score higher than the mean pretest value. After obtaining the calculation of mean pretest scores and mean posttest scores of students. A next step is analyzing data uses a paired sample t-test. Before doing the t test, need to check the normality and homogeneity. Normality testing and homogeneity testing are used the know the data shows normally distributed and homogeneous or not. Below is basically the resulting normality testing results with the use of an SPSS Statistics 26 for Windows application (Table 1):

Table 1. The Result of Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.097	44	.200*	.963	44	.166
Posttest	.087	44	.200*	.969	44	.283

Based on Table 1, in the normality test using Shapiro Wilk, the pretest sig value is 0.166 and the posttest sig value is 0.283. This shows the sig value> 0.05, so the data is normally distributed.

Table 2. The Result of Homogeneity

Test of Homogeneity of Variance					
		Levene Statistic	**df1**	**df2**	**Sig.**
Students' Critical Thinking Skills	Based on Mean	1.807	1	86	.182
	Based on Median	1.771	1	86	.187
	Based on Median and with adjusted df	1.771	1	84.141	.187
	Based on trimmed mean	1.805	1	86	.183

Based on Table 2, the homogeneity test on Based on Mean obtained a significance score 0.182> 0.05, the variance data can be declared homogeneous or equal.

Table 3. The Result of Paired Samples T-Test

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest - Posttest	-20.818	7.121	1.074	-22.983	-18.653	-19.392	43	.000

The result paired sample t-test shows Sig (2-tailed) value of 0.000 <0.05, so Ho rejects and Ha accepts.

As the results of the research above, it shows a difference in student think ability before and after applying an independent curriculum in science learning in grade 4 SDIT Baitussalam. This is in accordance with the results of interviews with the 4A homeroom teacher, 4B homeroom teacher, grade 3 teacher, and deputy principal of the curriculum section, he explained that students' abilities to think critically before implementing an independent curriculum in science learn in grade 4 students thinking ability are underdeveloped and not optimized because before the application independent curriculum at science learning in science learning emphasized more on the material and lacked practical or project activities that trained critical thinking students. In addition, it's also because students are less trained to think critically. Thus, a mean pretest value of students thinking ability is 67.05. In the learning process activities before implementing an independent curriculum in science lessons, there were still many students who were less active in asking questions which affected abilities to think critically.

However, after applying an independent curriculum in science lessons in class 4B, the critical thinking skills of students has begun develop and have increased with an average posttest score of 87,86. In this case, implementing the independent curriculum for science lessons in class

4B can train and improve students' critical thinking skills because ability think critically students continue being trained every day on learning activities. According to research findings conducted by (Nadhiroh S & Anshori I, 2023), implementing an independent curriculum in learning activities can't train and improve students' critical thinking skills by providing opportunities for asking and answering question. Science learning process activities in the independent curriculum also contain HOTS (higher order thinking skills) questions that require students to analyze and express opinions. In addition, think critical ability are continuously exercised through question and answer activities in order students become active during learning activity in the class student were provided with opportunities for their opinions to be expressed, especially during the learning process activities. In this way, it can indirectly help students to train ability think critically. Based on this, it matches a definition of critical thinking according to Menyer & Good Child as critical thinking using a thinking process that is carried out systematically and actively to assess an opinion (Marudut et al., 2020).

Implementation of an independent curriculum at science lessons in grade 4B at learning process activities emphasizes student-centeredness, student activeness, student experience through independent learning, and developing their knowledge. In addition, students are given the opportunity to explore knowledge by themselves, learning activities are made varied, and there is project-based learning. Thus, in the process of science learning activities there are project activities that can provide direct experience to students and can strengthen student character in accordance with the dimensions of the Pancasila learner profile. This is accordance with research by (Ganarsih et al., 2022) that through implementation an independent curriculum in science lessons, there are learning activities that carry out project activities so as to provide students with hands-on experience and to develop student character contained in the dimensions of the Pancasila student profile. In learning activities by application an independent curriculum in science lessons in grade 4, students play a more active role in activities.

Based on this, there are inhibiting factors and supporting factors at improve the ability think critically students to learn IPA in grade 4. The inhibiting factors to improve the ability to think critically students include facilities which are still incomplete both for quantity, quality, and students' lack of self-confidence. These results are in accordance with previous research by (Lubis & Syahputri, 2022) that inhibiting factors to improve the ability think critically students, namely facilities and infrastructure in the classroom that are still incomplete and the attention of students who are less focused during learning activities in the classroom which causes student concentration is disrupted. Meanwhile, the supporting factors consist of teachers' teaching and study activity, students interested to study, and students' study motivation. In according to the result researched by (Panungkas et al., 2023) which shows the existence of supporting factors to improve students' critical thinking ability which include, student learning motivation because before and after learning activities students are always given motivation by the teacher so that students are always enthusiastic to learning and interaction between teachers and students can also affect student critical think ability.

Study result and data analysis, it shows an increase of critical thought ability in science lesson at grade 4 SDIT Baitussalam through application an independent curriculum with an increasing in the average student's posttest value of 87,86. This is supported by research by (Nadhiroh S & Anshori I, 2023) which indicates the students' critical thinking skills have improved after implementation an independent curriculum which is evidenced by an increased mean value

posttest student. Thus, the application of an independent curriculum has played a role and can help increase students' critical thinking skills.

4. CONCLUSION

Through research and analysis, the critical think ability class 4 student in science lessons, it shows a difference between ability think critically students are before and after the implementation an independent curriculum in science learning in grade 4 SDIT Baitussalam. Before application an independent curriculum, students' critical thinking skills were less advanced because of a less critical thinking exercises the studying process with an average pretest score of 67.05. However, after the implementation of an independent curriculum, students' critical thinking skills increased with an average posttest score of 87.86. This showed that students' critical thinking skills can be improved through with application of an independent curriculum. In addition, it is concluded that there were inhibiting and supporting factors for improving critical thinking skills in science lessons in grade 4.

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