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The Influence of The Student Facilitator and Explaining Model in Differentiating IPAS Learning in The Independent Curriculum in Primary Schools

Prihantini[1], Muhammad Iqbal[2]*, Loso Judijanto[3], Muhammad Sukron Fauzi[4], Andiopenta[5], Gingga Prananda [6]

[1] Universitas Pendidikan Indonesia, Bandung, Indonesia
[2] Universitas Almuslim, Bireuen, Aceh, Indonesia,
[3] IPOSS Jakarta, Jakarta, Indonesia,
[4] Universitas Mulawarman, Kalimantan Timur, indonesia
[5] Universitas Jambi, Jambi, Indonesia,
[6] Universitas Nahdlatul Ulama, Padang, Indonesia

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Corresponding Author:
Muhammad Iqbal
muhammadiqbal@umuslim.ac.id

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Abstract: Science is a combination of Natural Sciences (IPA) and Social Sciences (IPS) which is now a new subject in the Independent Curriculum. Science and Technology began to be taught in elementary schools to develop students' basic abilities in natural sciences and social sciences. In science and science subjects, teachers are still monotonous or too often rely on student books and teacher books. As we know, elementary school students are still children, so if the teacher is always monotonous teaching will be boring. This research aims to determine the effect of the Facilitator and Explain learning model on the science learning outcomes of class IV students at SDN Cibiru 6 KCKB. This type of research is experimental research. The sampling technique uses *Purposive Sampling*. The instrument in this research is a test of student learning outcomes, while the data analysis technique uses the t-test. Based on the results of the research, the average value of the experimental class was 83.00 and 73.40 in the control class. It can be seen from the results of the data analysis that has been carried out that t_{count} (3.29) > t_{table} (1.68), so the hypothesis is accepted. From the research results it can be concluded that there is an influence of the Facilitator and Explaining model on students' science learning outcomes. For this reason, it is recommended that teachers who teach science subjects apply the Facilitator and Explaining model in the learning process.

Keywords: Explaining; Science; Facilitator; Independent Curriculum

Introduction

The curriculum is an important tool for education because education and the curriculum are interrelated. If it is likened, the curriculum is like the heart in the human body, if the heart is still functioning well, the body will still be alive and functioning well. The same applies to curriculum and education. If the curriculum runs well and is supported by components that work well, the learning process will run well and produce good students (Grassini, 2023). The curriculum will continue to change and be sustainable. Continuous and sustainable curriculum changes must also be accompanied by the readiness of all parties involved in the world of education in Indonesia to make changes, because the curriculum is dynamic, not static (Jannah, 2023). If the curriculum is static, then the curriculum is bad because it does not adapt to current developments.

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At this time the role of teachers is very necessary. The Independent Curriculum is a new curriculum issued by the Indonesian government to develop a more independent and contextual curriculum for students throughout Indonesia. Stand-alone courses are designed to create courses that are more aligned with student needs and give teachers the freedom to develop more interesting and meaningful learning materials (Iversen et al., 2015).

According to Nilimaa (2023), Fletcher & Ní Chróinín (2022), the Independent Curriculum prioritizes creative and fun attitudes by nurturing students' interests and talents. In its implementation, the Merdeka curriculum requires an active role from teachers in compiling, designing, and implementing the curriculum during the classroom learning process (Saparuddin et al., 2024). Therefore, teacher planning readiness is very important in implementing the Independent Curriculum. No matter how well the curriculum is made, if the teacher does not have good skills or qualifications then the curriculum will not work well. According to (Muhammadiah et al., 2022), Teachers are the most important component in the education system which must receive primary attention, teachers are always connected to these components and the education system.

Therefore, teachers play a very important strategic role in the educational context, as explained by Zulfatunnisa (2022), teachers are the main element in the entire educational process, especially at the institutional and educational levels. Without them, education will just be a big slogan because all policies and programs ultimately depend on teacher effectiveness. Science and Technology is a combination of Natural Sciences (IPA) and Social Sciences (IPS) which is now a new subject in the Independent Curriculum (Rusmini et al., 2023; Rahmadiningrum & Wulandari, 2024). Science and Technology began to be taught in grades III and IV of elementary school to build the basic abilities of each student regarding natural and social sciences (Dewi et al., 2023). Combining these two subjects is very useful because according to Bennett et al. (2017), Albert et al. (2021), natural science and social research are important in answering many questions and human needs. This is important for students because apart from studying and gaining knowledge at school, students must also understand the social life around them. Therefore, an interesting learning model is needed so that the active learning process can occur.

The importance of using learning models as a strategy for how learning is implemented can help students develop themselves in the form of information, ideas, value skills, and ways of thinking in increasing their capacity to think clearly (Busyairi et al., 2022; J. A. C. Van Der Zanden et al., 2020). Moreover, in the current curriculum, namely the Merdeka Curriculum, there are science and science subjects which of course need additional teaching materials to support the learning process (Rahma Harfiani & Anatri Desstya, 2023). The use of models in the learning process can increase students' interest when delivering the material being taught. From the results of observations carried out at SDN Cibiru 6 KCKB on February 9, 2023, in science and science subjects teachers are still monotonous or too often rely on student and teacher books. As we know, students in basic education are still children, and if the teaching given by the teacher is still monotonous it will be boring. They prefer to see pictures, read stories, or do something rather than just listen to the teacher explain it in front of the class. When the teacher explains the lesson material, many students remain busy chatting with friends. Therefore, a solution is needed to overcome this problem. In learning, using an interesting model is very good for increasing students' interest in learning in class. Student Facilitator And Explaining is a place where participants present their ideas to other participants (Bergmark & Westman, 2018; Díez-Palomar et al., 2021).

The basic idea of the Student Facilitator and Explaining learning model is how teachers can present or demonstrate the material in front of students and then allow them to explain it to their friends. With a learning process like this, students can improve their mathematical communication skills. By using this model, the delivery of material will be easier to understand. Based on this discussion, researchers are interested in conducting research with the title "Application of the Student Facilitator and Explaining Model in Independent Curriculum Differentiated Science Learning".

Method

The type of research used is experimental research. This is my opinion (Leatherdale, 2019) which defines that experimentation can be interpreted as a research method used to find the effect of certain treatments on others under controlled conditions. The main goal of this methodology is to explain a problem but produce generalizations. The research was conducted on two classes, namely the experimental class and the control class. An experimental class is a class that is given certain subject matter using the Student Facilitator and Explaining learning model while the control class is a class that is given certain subject matter but does not use the Student Facilitator and Explaining learning model. The experimental class and control class were both given a final test to determine student learning outcomes.

Population and Sample
Population

Population is a general area consisting of objects whose particular magnitude and characteristics are determined by the researcher and then conclusions are drawn. "Population is one of the essential things and needs careful attention if researchers want to conclude results that can be trusted and are appropriate for the area or object of research." The population in this study were all class I-V students at SDN Cibiru 6 KCKB. The number of students at SDN Cibiru 6 KCKB can be seen in the following picture.

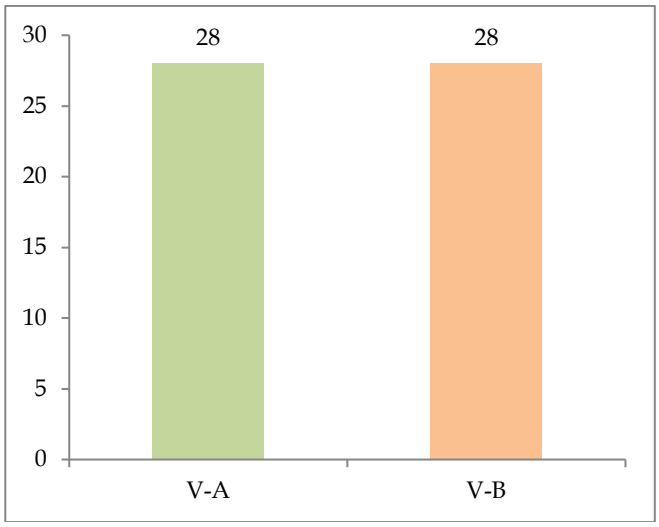

Figure 1. Population

Sample

Based on the quote above, the research sample was taken using the Purposive Sampling technique. According to Andrade (2021), states that " *Purposive Sampling* is a sampling technique with certain considerations". Because there were only two classes with a student population of only 56 students, the researchers only took one class as the experimental class, namely class IV-B, and class IV-A as the control class. To determine the class to be used as the experimental class, the researcher used a purposive sampling technique, by observing students' daily test scores. where on average the students who completed science learning were more in class IV-A, so the researchers made class IV-A the control class and class IV-B the experimental class.

Data collection technique

The data required in this research is quantitative data obtained after being given a final test on the research object. Quantitative data is obtained from student learning outcomes in the cognitive domain. The cognitive domain is obtained after being given a test at the end of the research, the stages are as follows:

Cognitive Domain

Provide research instruments to the two sample classes, namely in the form of a final test; Processing data from both sample classes, both the experimental class and the control class; Draw conclusions based on the results obtained according to the analysis technique used.

Results And Discussion

Analysis of Test Question Data

Validity is used to determine the validity of the test questions that will be used in the research. Test questions were held on the 15th of May 20 23 at SDN Cibiru 6 KCKB in class V at 08.00. Based on the analysis of the validity of the test questions that were searched manually, the results of the validity analysis of the test questions were obtained which can be seen in Table 1.

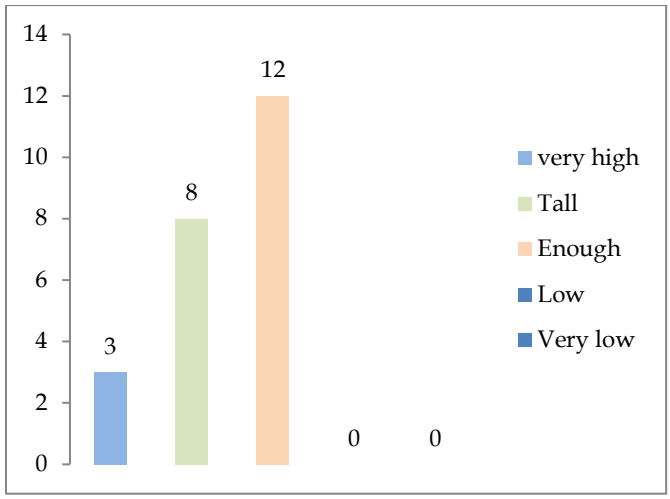

Figure 2. Results of Validity Analysis of Test Questions

There are no questions in the very high validity criteria because there are no questions in the range 0.800 - 1.00, in the high validity criteria there are 8 questions in the range 0.600 - 0.800, in the sufficient validity criteria there are 12 questions in the range 0.400 - 0.600, there are no questions in the low validity criteria because there are no questions in the 0.200 - 0.400 category, and there are no questions in the very low validity criteria because there are no questions in the 0.00 - 0.200 validity criteria. So, all the questions can be used in the research that will be carried out.

Test Reliability

Reliability is a measure of the accuracy of a research tool in measuring something being measured. A test is said to have high reliability if the test can provide accurate results even though the times are different. Based on the reliability analysis of the test questions that

were searched manually, the results of the reliability analysis of the test questions were obtained which can be seen in Table 1.

Table 1. Results of Test Reliability Analysis of Trial Questions

n-1	s^2	∑PQ	r_{11}	Information
20	2 6,2 1	3.7 4	0.89	Very high

Level of Difficulty

The difficulty level of a question is a quantity used to state whether a question is included in the easy, medium, or difficult category. Based on the analysis of the difficulty level of the questions searched manually, the results of the analysis of the difficulty level of the test questions were obtained which can be seen in the following picture.

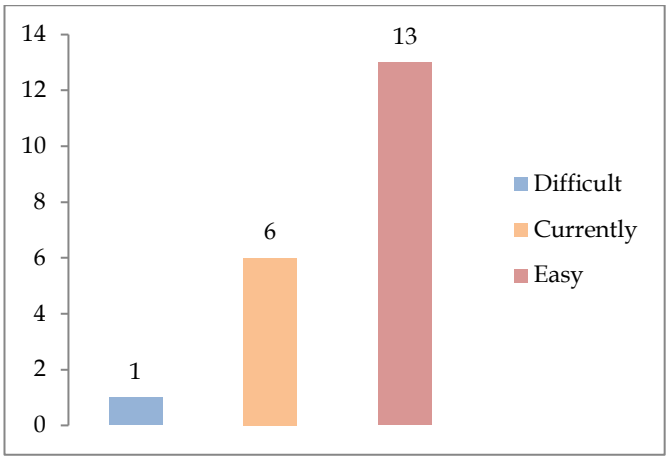

Figure 3. Results of Analysis of Difficulty Levels of Trial Questions

Differentiating Power

The discriminating power of a question is the ability of a question to differentiate between smart students (high ability) and stupid students (low ability). Based on the analysis of the differentiating power of manually searched questions, the results of the differentiating power analysis of test questions were obtained which can be seen in the following picture (Hansen & Świderska, 2023; Dwivedi et al., 2021; Elkhatat et al., 2023).

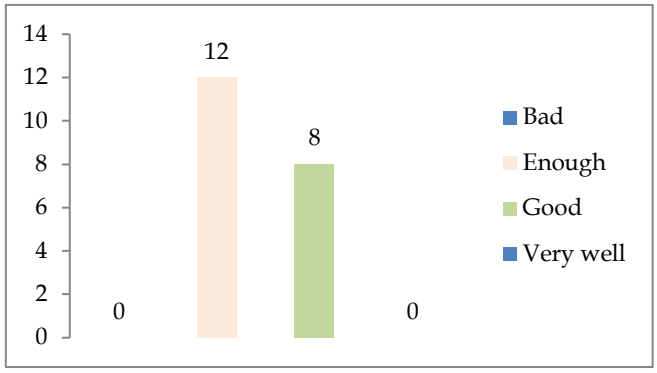

Figure 4. Results of Differentiating Power Analysis of Trial Questions

It can be seen that there are no questions in the poor category because there are no questions that are in the discriminating power index between 0.00 - 0.20, in the fair category there are 12 questions that are in the discriminating power index between 0.21 - 0.40, in In the good category there are 8 questions that are in the discriminating power index between 0.41 - 0.70, and there are no questions in the very good category because there are no questions in the discriminating power index between 0.71 - 1.00.

Research Data Analysis

To be able to conclude, testing can be done using the normality test, and homogeneity test, then continued with hypothesis testing.

Sample Class Normality Test

In this normality test, the *Liliefors test is used* as stated in the data analysis technique. Based on the normality test for the experimental class and control class, L_0 and L_{table} at the real level $\alpha = 0.05$ for $n > 26$ as in the following figure.

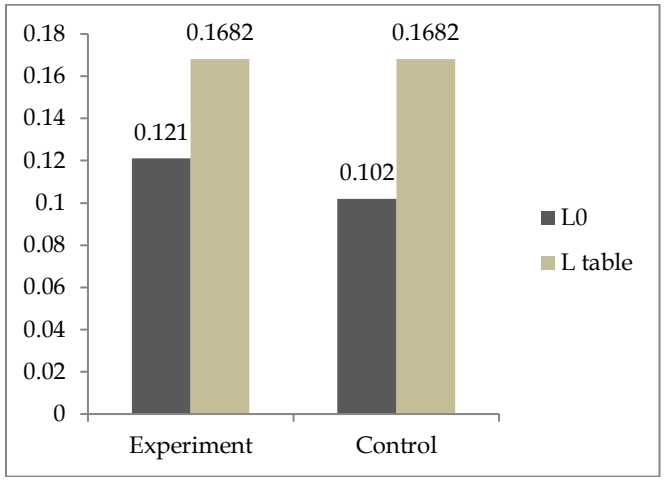

Figure 5. Normality Test Results for Experimental Class and Control Class

It can be seen that the experimental class and control class have $L_o < L_{table}$, it can be concluded that the two sample classes have a normal distribution.

Sample Class Homogeneity Test

To determine whether the experimental class and control class have homogeneous variances or not, an F test is carried out. Sample homogeneity analysis can be seen in the following figure.

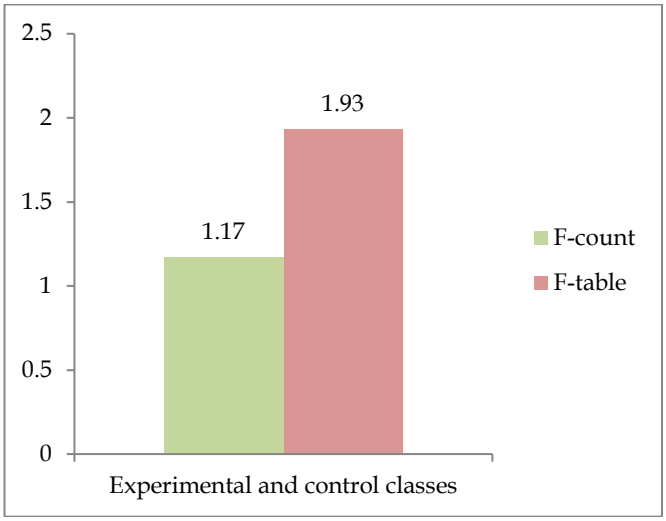

Figure 6. Results of Homogeneity Test for Experimental Class and Control Class

The calculation results using the homogeneity test are F_{count} of 1.70 < F_{table} of 1.93, if the value of f_{count} is smaller than the value of f_{table} it means the data group has a homogeneous variance, conversely if the value of f_{table} is greater than f_{count} it means both groups of data do not have homogeneous variance.

Hypothesis testing

Based on the normality test and homogeneity test for the experimental class and control class, it was found that the data was normally distributed and both groups of data were homogeneous, so the T-test was used to test the hypothesis.

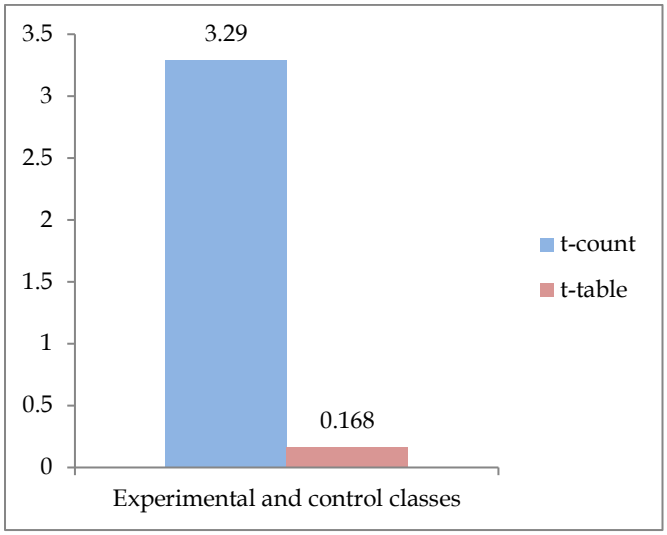

Figure 7. Hypothesis Testing for Experimental Class and Control Class

The results of calculations using the t-test shows that the data is $t_{count} = 3.29 > t_{table} = 1.68$, so H_o is rejected and H_1 is accepted because the t_{count} is smaller than t_{table} if the t_{table} is smaller than t_{count} then H_0 is accepted.

In principle, the learning process concerns overall personality development through various interactions and learning (Sörman et al., 2024; Baumert et al., 2017). However, in practice, there are still many learning processes that do not involve students in the process (Montenegro-Rueda et al., 2023; Nicol, 2021). Realizing the importance of involving students in the learning process, in science learning at SDN Cibiru 6 KCKB class IV, research has been carried out using the Facilitator and Explaining learning model which can stimulate student activity. In this research, the Facilitator and Explaining model was used in learning the material Me and My Needs in fourth-grade elementary school. Students in the experimental class learn using the Facilitator and Explaining model, while the control class learns using the experimental method, namely a practicum preceded by a lecture method by the teacher. From the hypothesis analysis, it was found that both classes had the same or homogeneous initial knowledge. The homogeneity of the two groups plays an important role in investigating the effect of a treatment (Piccoliori et al., 2024; Zhou et al., 2023).

The implementation of the learning model using Facilitator and Explaining in class has gone smoothly and the results are different from learning using the experimental method. The science and science critical thinking skills of class IV students showed that students who used the Facilitator and Explaining model were overall significantly higher than students who were taught using the experimental method. In some literature it can be concluded that facilitator and explanation refer to the delivery of teaching material

which begins with a general explanation, allows students to explain it again to their friends, and finally conveys the material to the students. Although there are different versions of the method, they all start with an elicitation phase to capture students' attention and connect with their previous knowledge. Additionally, all models encourage inquiry, and the role of teachers and counselors is to apply what is learned to new situations. There is research that supports the effectiveness of this method in acquiring scientific concepts and skills.

The study found loop learning resulted in better acquisition of scientific concepts compared to traditional methods (Stam et al., 2023; Basten & Haamann, 2018). Next, Pedaste et al. (2015), Rakes et al. (2023), and Carless & Boud (2018) state that the phases of the cycle provide opportunities for students to concentrate and be interested in being actively involved in the process, using their knowledge and acquiring new knowledge by using previous experiences, developing investigative and self-assessment skills. The results of testing the first hypothesis revealed that overall, the experimental class students applied the model Facilitator and Explaining was significantly higher compared to the control class. The results of calculations using the t-test show that $t_{count} = 3.29 > t_{table} = 1.68$, so H_o is rejected and H_1 is accepted because the t_{count} is smaller than the t_{table} if the t_{table} is smaller than the t_{count} then H_0 is accepted. The high average score for the experimental class compared to the control class was caused by the effect of the treatment given to the experimental class, namely the Facilitator and Explaining model (Salong, 2023). This is also supported by the research results of (Siller & Ahmad, 2024), and (Darling-Hammond et al., 2020) which reveal that the Facilitator And Explaining Model causes better improvements in learning than conventional methods.

The Facilitator and Explaining model in the experimental class of this student-centered approach improves student learning and encourages the development of their critical thinking skills (Papilaya & J. Tuapattinaya, 2022). By prioritizing students' experiences and encouraging self-discovery and exploration of their thinking, students can improve their thinking skills and engage in critical analysis. This is in line with the findings of (Isa et al., 2023) whose research supports the idea that the Facilitator And Explaining model encourages student activity and improves learning outcomes. Apart from cultivating active, critical, and creative students, this model emphasizes the importance of student involvement (Susetyarini et al., 2022).

Conclusion

Based on the results of research conducted at SDN Cibiru 6 KCKB, it can be concluded that there are differences in the learning outcomes of IP A S class I VA students who were used as the control class by applying the conventional learning model. The Facilitator And Explaining model is used in learning material about Me and My Needs in fourth-grade elementary school. Students in the experimental class learn using the Facilitator and Explaining model, while the control class learns using the experimental method, namely a practicum preceded by a lecture method by the teacher. From the hypothesis analysis, it was found that both classes had the same or homogeneous initial knowledge. The science learning results of class IV-B students who were used as an experimental class have an average of 83.00 higher than the science learning results of class VA students who were used as a control class that uses conventional learning with an average value of 73.40.

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Author Contributions
Conceptualization, P.; methodology, M. Q.; validation, L. J.; formal analysis, M. S. F; investigation, A.; resources, G. P.; data curation, P.: writing—original draft preparation, M. Q.; writing—review and editing, L. J.: visualization, M. S. F. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest
The authors declare no conflict of interest.

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