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Picture and picture method media puzzle assisted on learning outcomes in the cognitive realm of Grade V elementary school students

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ABSTRACT

This study aims to describe the magnitude of the influence of the *Picture And Picture* model with the help of *Puzzle* media on the science learning outcomes of fifth grade students. The instruments in this study were student learning outcomes question sheets and student learning activity observer sheets. The instrument in this study were the student learning outcomes question sheets and student learning activity observer sheets. The type of research used is quantitative research with the quaisy experiment method. The population in this study were all fifth grade students of SDN 06 Sungai Rusa, totaling 48 students. Samples taken using the saturated sample technique. The sample that became the experimental class was the VA class using the *Picture and Picture* model with the help of *Puzzle* media, while the VB class as the control class using the conventional method. The data analysis technique in this study used the T test and the *Effect Size* (E_S) test. The results of the hypothesis test show that the value of t_{count} = 3,365 and value t_{table} = 2,012 for α = 5% and dk = 48, which means that there is a significant effect on learning outcomes between students who applied the *Picture and Picture* learning model assisted by *Puzzle* media and students who received direct learning. So it can be concluded that the use of the *Picture and Picture* model with the help of *Puzzle* media can affect student learning outcomes.

1. Introduction

Natural Sciences (IPA) Science is defined as a c.ollection of knowledge about objects and natural phenomena obtained from the thoughts and investigations of scientists carried out with experimental skills using the scientific method (Selvi, 2018:1). Natural Sciences (IPA) is related to how to find out about nature systematically, so that science is not only the mastery of a collection of knowledge in the form of facts, concepts or principles but also a process of discovery (Permendiknas, 2006). Science education in Indonesia is still low. The low quality of science education in Indonesia is shown by the results of the PISA survey in 2018 Indonesia is ranked 71st with an average score of 396 (Hewi & Shaleh, 2020: 35). Science learning outcomes in elementary schools are still relatively low. This phenomenon is supported by research conducted (Sari & Mintohari, 2014:1), which suggests that the presentation of science learning is boring and does not involve students in learning activities, so that the acquisition of learning outcomes is less than optimal. Of the 30 students, only about 45% can reach the KKM. The science learning process that has occurred so far has not been implemented properly.

Based on the results of the pre-research conducted at SDN 06 Sungai Rusa, there were several obstacles encountered in learning science, namely (1) students did not listen and pay attention when the teacher was explaining the lesson, (2) students were less active in asking and answering questions from the teacher, (3) students do not cooperate in discussions, (4) teachers still use the lecture method

in the teaching and learning process, (5) student learning outcomes in science subjects are still low. This problem resulted in the learning outcomes of science (cognitive) aspects of the fifth grade students of SDN 06 Sungai Rusa still not reaching the KKM (Minimum Completeness Criteria). Improving student learning outcomes requires the creativity of a teacher in choosing a learning model. A good learning model is a learning model that emphasizes good interactions between teachers, students and learning resources so that the learning process can be more meaningful. If the model and the objectives of science learning are applied in the teaching and learning process, the teacher can evaluate learning as a result of student learning which is the ability obtained by students after carrying out learning activities (DRS.M. Ngalim Purwanto, 2010:44) argues that learning outcomes are often used as a measure to determine the extent to which a person has mastered the material that has been taught. Assessment of student learning outcomes includes aspects of knowledge (cognitive), aspects of attitudes (affective), and aspects of skills (psychomotor) (Syarifuddin K., S.Pd.I., 2018:35). This study focuses on the learning outcomes of the knowledge (cognitive) aspect because it is related to the students' ability to master the science subjects given to students.

From the context of the problems stated above, we need a learning model that can affect the learning outcomes of knowledge (cognitive) aspects, namely the cooperative learning model. According to (Agus Suprijono, 2017:73) cooperative learning is a broader concept that includes all types of group work, including forms that are more teacher-led or teacher-directed. According to Joyce (in Simatupang, 2019:85) through the learning model teachers can help students get information, ideas, skills, ways of thinking, and expressing ideas. Thus, the learning model becomes one of the factors in determining the success of teachers to carry out teaching and learning activities. To achieve this goal, an interesting and fun learning model is needed, one of which is the Picture And Picture learning model. Picture and Picture learning model is one solution in solving problems in science learning. The existence of the Picture and Picture model will facilitate the teaching and learning process and when applying this model students will find it easier to understand the material that will be delivered by the teacher. According to Marsudi (in Budiyanto, 2016:119) the Picture And Picture learning model is a learning model that uses pictures that are paired or sorted into a logical sequence. This learning model relies on images as a medium in the learning process. These pictures become the main factor in the learning process. So that before the learning process the teacher has prepared an image that will be displayed both in the form of cards and in the form of large charts. Picture and Picture is a learning model in which the teacher uses tools or image media to explain a material or facilitate students to be active in learning. By using these tools, students are expected to be able to follow the lesson with a good focus and in pleasant conditions, so that any message conveyed by the teacher can be well received and can be remembered by students.

Research that supports the Picture And Picture model is the research conducted by (Eka & Marli, 2014) "Increasing Activities and Learning Outcomes with Media Puzzle in Science Learning in Elementary Schools". The results showed that the learning activity of students in cycle 1 was 75.79, increased to 88.49 and increased in cycle 2. Meanwhile, student learning outcomes in cycle I averaged 91.07 and increased in cycle II to 95.71. To achieve this goal, interesting and fun learning methods and media are needed, one of which is Puzzle media. Media Puzzle is a game consisting of pieces of pictures, numbers or letters that are arranged into a complete and correct picture, with the aim that students become active in learning activities. Puzzle media has good benefits for students, because Puzzle media can hone students' thinking power and can train students to think quickly. This is done so that students do not feel bored and bored when teaching and learning activities take place in the classroom. This study aims to see "The Influence of Picture And Picture Models Assisted by Media Puzzle on Learning Outcomes in the Cognitive Realm of Grade V Elementary School Students". This research is expected to produce a comparison between the Effect of Picture And Picture Model Assisted by Media Puzzle with conventional learning methods on students' science learning outcomes.

2. Method

The type of research used in this study is a type of quantitative research using a pretend experimental method (Quaisy Experiment). The design in this study is a nonequivalent control group design in which the experimental group and control group are not chosen randomly (Sugiyono, 2018:79). This study used two classes, namely the control class and the experimental class. The control class is the class that is not treated and the experimental class is the class that is treated using the Picture And Picture learning model.

Table 1. Reseach Design (Sugiyono, 2018)

Group	Pre test	Treatment	Post test
Experiment	O_1	X	O_2
Control	O_3	-	O_4

O_1 = *Pre test* kelas experiment; O_2 = *Post test* kelas experiment; O_3 = *Pre test* kelas control; O_4 = *Pre test* kelas control; X = Treatment with the *Picture And Picture* model with the help of *Puzzle* media. The population in this study were all fifth grade students at SDN 06 Sungai Rusa for the 2020/2021 academic year, totaling 48 students, namely 24 students in class VA and 24 students in class VB. The sampling technique in this study is non-probability sampling with the type of saturated sample (total sampling). The sample in this study was class VA and VB at SDN 06 Sungai Rusa with a total of 48 students.

Table 2. Reseach Sample SDN 06 Sungai Rusa

Class Name	Total Student
V A (Control)	24
V B (Experiment)	24
Amount	48

Data collection techniques are systematic and standard procedures to obtain the necessary data (Mamik, 2015:103). Data collection techniques in this study are test techniques and non-test techniques. The test technique in this study is to provide an objective test in the form of multiple choice given at the time of pre-test and post-test in the experimental class and control class. The non-test technique used in this research is the observation technique. Observation technique aims to determine student learning activities. The data collection instruments in this study were test sheets and observation sheets. The test sheet is in the form of pre-test and post-test question sheets. The test used consists of multiple choice questions. To determine the effect of science learning outcomes on the knowledge (cognitive) aspect of the classroom using the Picture And Picture model with the help of Puzzle media and the class without the Picture and Picture model assisted by the Puzzle media, prerequisite tests were carried out, namely normality and homogeneity. The normality test used is using the chi-square formula and the homogeneity test using the f formula. After the data is normally distributed and homogeneous, it is continued by using the t-test rumus formula.

3. Results and Discussion

The learning outcomes of data collection carried out during the study in class V SDN 06 Sungai Rusa are pre-test and post-test data from the experimental class who were given treatment using the *Picture And Picture* learning model assisted by *Puzzle* media and the control class using conventional methods. After the post-test data were analyzed, the mean, standard deviation, variance of the experimental class and control class were obtained which are presented in Table 3.

Table 3. Student Learning Outcomes of Experiment Class and Control Class

Post-Test Data	Control Class	Experiment Class
Average	54	73
Standard Deviation (SD)	14,54	12,42
Variance (S^2)	211,41	154,34

The recapitulation of the experimental and control class students' scores is presented in the form of Fig 1. From Fig 1, it can be concluded that there are differences in the learning outcomes of the experimental class and the control class. Then it can be seen that the experimental class post-test learning outcomes are different from the control class post-test learning outcomes. To determine the effect of student learning outcomes on science learning between the experimental class and the control class at SDN 06 Sungai Rusa using a two-sample t-test. But before that, a prerequisite test will be carried out, namely normality and homogeneity tests.

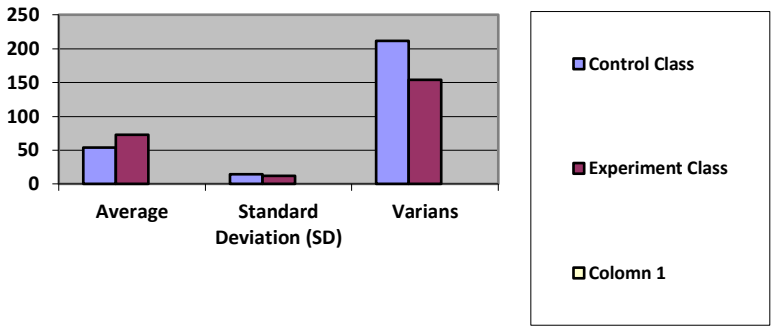

Fig. 1. Bar Chart of Student Learning Outcomes in Experiment Class and Control Class

The normality test was carried out to determine whether the post-test data that had been collected came from a normally distributed population or not by using the chi-square test formula, so that the results of the post-test data normality test for the experimental class were obtained x^2_{count} that is -20,1925 and x^2_{table} is -7,814 because $x^2_{count} \leq x^2_{tablel}$ that is -20,1925 ≤ 7,814 then the data is normally distributed. While the results of the calculation of the data normality test in the control class obtained x^2_{count} that is -9,57862 and x^2_{table} is 7,814 because $x^2_{count} \leq x^2_{table}$ that is -9,57862 ≤ 7,814 then the data is normally distributed. It can be concluded that the experimental class and control class data are normally distributed. The homogeneity test is carried out to compare two groups of data, one must perform a diversity similarity test or a variance similarity test for data groups first. After the post-test data for the experimental class and control class were calculated, it was found that the data were normally distributed. For the calculation of the homogeneity test data, the formula f is used, so it is known that the experimental class variance is 154,347 and becomes the largest variance, while the control class variance is 211.413 and becomes the smallest variance because $f_{count} < f_{table}$ that is 1,369 < 2,014. It can be concluded that the experimental class and the control class have the same or homogeneous variance. Based on the calculation of the normality test and homogeneity test, it was obtained that the post-test data of the experimental class and control class were normally distributed and had the same or homogeneous variance. Then further test the average similarity of the two classes using the two sample T-test. The results of the two sample T-test calculations are presented in Table 4.

Table 4. Two Sample T-Test Calcuation Results

Group	Dk	a	t_{count}	t_{table}	Decision	Coclusion
Experiment and conntrol	48	5%	3,365	2,012	H_a received	There are Differences in Learning Outcomes

Furthermore the post-test data analysis of the experimental class and control class was carried out using statistical tests, namely the T test, then it was known that t_{count}= 3,365 and t_{table}= 2,012 obtained $t_{count} > t_{table}$ that is 3,365 > 2,012 than H_a is accepted H_o rejected. It can be concluded that there are differences in student learning outcomes who are taught with the *Picture And Picture* learning model assisted by *Puzzle* media with conventional methods in science learning material for the respiratory system in fifth grade students of SDN 06 Sungai Rusa. Because there are differences, there is an effect of student learning outcomes between classes given the Picture And Picture learning model assisted by Puzzle media with conventional methods in science learning material for the respiratory system in fifth grade students of SDN 06 Sungai Rusa. To find out how much influence student learning outcomes have, the formula is used Effect Size (E_S), so it can be seen E_s= 1,30 and hight criteria because 1,30 is at E_s > 0,8. It can be concluded that the use of the Picture And Picture learning model with the help of Puzzle media has a high effect on students' science learning outcomes on the respiratory system material in class V SDN 06 Sungai Rusa. Based on the post-test data analysis of the learning outcomes of the experimental class and the control class, it was found that the data were normally distributed and had the same or homogeneous variance. So that there are differences in the learning outcomes of the experimental class who were given treatment using the Picture And

Picture learning model assisted by Puzzle media with the control class using conventional methods in science lessons on human respiratory system material for fifth grade students at SDN 06 Sungai Rusa. There are several factors that cause differences in student learning outcomes in the control and experimental classes, one of which is the treatment given during the learning process, both learning models and learning media. For the experimental class, the learning outcomes of students who were treated using the Picture And Picture learning model assisted by Puzzle media experienced a higher increase compared to the control class using conventional methods. The increase in student learning outcomes in the experimental class was due to the fact that during the learning process treatment was given using the Picture And Picture model with the help of Puzzle media. Using the Picture And Picture model with the help of Puzzle media in science lessons on the human respiratory system material for class V SDN 06 Sungai Rusa provides a meaningful experience, increases students' creativity and makes students feel bored when learning because by using the Picture And Picture model with the help of media Puzzle students can learn while playing.

Meanwhile for the control class using conventional methods and image media (if in accordance with the material presented). Using conventional methods in the control class causes the learning process to tend to be researcher-centered. So that the control class that uses conventional methods has a lot of negative impacts rather than positive ones. This can be seen during the learning process because students tend to be passive, easily bored, because of the infrequent interaction between teachers and students as well as between students and students, students do not listen and speak when the researcher is explaining, resulting in student learning outcomes getting scores below KKM, which is 65. Using conventional methods in science learning material on the respiratory system in class V students of SDN 06 Sungai Rusa causes learning to be less effective. This shows that the Picture And Picture learning model assisted by Puzzle media has a significant influence on the science learning outcomes of students on respiratory system material in class V SDN 06 Sungai Rusa. Because the experimental class was given treatment by applying the Picture And Picture learning model assisted by Puzzle media, thus forming students to be active and with interactions between researchers and students as well as students and students. This agrees with the research of (Eka & Marli, 2014) which states that the learning process using the Picture and Picture model increases student activity and learning outcomes.

4. Conclusion

In this study, there were differences in student learning outcomes using the Picture And Picture learning model with the help of Puzzle media with those using conventional methods in science learning for fifth grade elementary school materials for the human respiratory system. Because there are differences, there is an influence on the learning outcomes of the experimental class and control class on the science lesson on the respiratory system material in class V students of SDN 06 Sungai Rusa which was analyzed using parametric statistical test T test with t_{count}= 3,365 > t_{table}= 2,012. The Picture And Picture learning model assisted by Media Puzzle can be chosen as an alternative relevant learning model in addition to the direct learning model in science learning, so that it can help the learning process become more active and fun and can help students to get maximum learning outcomes.

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