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The Influence of The Creative Problem Solving (CPS) Model on Science Learning Outcomes in Terms of Students' Multicultural Attitudes

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Abstract: The influence of the Creative Problem Solving (CPS) Model on Science Learning Outcomes in Terms of Students' Multicultural Attitudes. This research aims to see the influence of the CPS model on science learning outcomes in terms of the multicultural attitudes of class V students. This research is a quasi-experimental research with a research plan using a posttest only control group design. The population in this study were all class VI students at SD Negeri Gugus II Ledokombo, totaling 334 students. The sample consisted of 120 students who were divided into two experimental classes and two control classes using group random sampling techniques. The instruments used were science learning outcomes tests and multicultural attitude questionnaires. Data analysis was carried out using ANOVA. The research results showed that: The first hypothesis test was 39.508) (Sig. < 0.050)). This means that there are differences in the results of testing the second hypothesis, "multicultural model*attitude" (A*B) = 4.468 (Sig. < 0.050)). This means that there is an interaction effect. Testing the third hypothesis (Qtable (0.050) = 4.11, Qcount =8.518, Qcount>Qtable). This means that there is a significant difference between the science learning outcomes of students who have high multicultural attitudes when treated using CPS learning and conventional learning. Fourth hypothesis testing (Qtable (0.050) = 4.11, Qcount =4.237, Qcount>Qtable). This means that there is a significant difference between the science learning outcomes of students who have low multicultural attitudes when given treatment using CPS learning and conventional learning.

Keywords: science learning outcomes, CPS, multicultural attitudes.

Abstrak:Pengaruh Model CPS Terhadap Hasil Belajar IPA Ditinjau dari Sikap Multikultural Siswa. *penelitian ini bertujuan untuk melihat pengaruh model CPS terhadap hasil belajar IPA ditinjau dari sikap multikultural siswa kelas V. Penelitian ini merupakan penelitian quasi eksperimen dengan rencana penelitian menggunakan posttest only control group design. Populasi dalam penelitian ini adalah seluruh siswa kelas VI SD Negeri Gugus II Ledokombo yang berjumlah 334 siswa. Sampel berjumlah 120 siswa yang dibagi menjadi dua kelas eksperimen dan dua kelas kontrol dengan menggunakan teknik group random sampling. Instrumen yang digunakan adalah tes hasil belajar IPA dan angket sikap multikultural. Analisis data dilakukan dengan menggunakan ANOVA. Hasil penelitian menunjukkan bahwa: Pengujian hipotesis pertama sebesar 39,508) (Sig. < 0,050)). Artinya terdapat perbedaan hasil Pengujian hipotesis kedua, "model*sikap multikultural" (A*B) = 4,468 (Sig. < 0,050)). Artinya terdapat pengaruh interaksi. Pengujian hipotesis ketiga (Qtabel (0,050) = 4,11, Qhitung =8,518, Qhitung>Qtabel). Artinya terdapat perbedaan yang signifikan antara hasil belajar IPA siswa yang mempunyai sikap multikultural tinggi ketika diberikan perlakuan menggunakan*

pembelajaran CPS dengan pembelajaran konvensional. Pengujian hipotesis keempat (Qtabel (0,050) = 4,11, Qhitung =4,237, Qhitung>Qtabel). Artinya terdapat perbedaan yang signifikan antara hasil belajar IPA siswa yang mempunyai sikap multikultural rendah ketika diberikan perlakuan menggunakan pembelajaran CPS dengan pembelajaran konvensional..

Kata kunci: *hasil belajar IPA, CPS, Sikap multikultural*

▪ INTRODUCTION

Indonesia is a developing country that is actively developing. According to (Arrasyid et al., 2022) developing countries will find it more difficult to improve their quality to become developed countries. For this development purpose, in addition to requiring a resource model, adequate human resources are required. One effort to create and improve human resources is through education. Education has an important role to improve the quality and quantity of human resources.

Education in Indonesia is one aspect of supporting national development. National development is carried out through collaboration between various elements, such as adequate infrastructure, adequate natural resources and quality human resources. (Susanto, 2020) Education is a process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts; process, method, act of educating. So that with education we can find out and gain a lot of knowledge that can increase our skills and can also increase the talents that exist within each person (Leus & Herssens, 2015).

Teaching in a broad sense is also a process of teaching activities, and carrying out learning can occur in any environment and at any time (Aqib Z dan Chotibuddin M, n.d.) Learning is a process, an activity and not a result and goal. Learning is not remembering but experiencing , while teaching is the process of guiding learning activities, and teaching activities will be meaningful if there is interaction between the teacher and students (Susanto, 2020).

Learning goals are achieved due to interaction between teachers and students. Interaction will occur if there is a sense of interest in the student. The learning model is one method that can be used to create a pleasant atmosphere in the classroom so that students have an interest in learning. According to (Wapa et al., 2023) argue that a learning model is a plan or pattern that can be used to form a curriculum (long-term learning plan), design learning materials, and guide learning in class or otherwise.

The learning model can be used as a pattern of choice, meaning that teachers choose a learning model that is appropriate and efficient to achieve their educational goals

The need for science for human life is very important because it can encourage quality improvement in the form of cognitive, affective and psychomotor competencies. These needs all have complex challenges so that humans must be able to adapt to developments over time. The main problems faced by Indonesia are presented in the following table :

Table 1. PISA Ranking source from (Tilamsari et al., 2023)

NO	country name	year	Rank	number of countries
1	Indonesia	2018	74	79

The problem faced by the Indonesian nation is the weakening of science from the results of the PISA survey which shows that Indonesia was identified by 74 of the 79

countries that took part in the survey in 2018, meaning that the science crisis in Indonesia needs more attention in order to increase the generation of better science. This is in accordance with the opinion (Sunyono et al., 2009) In learning like this they will feel as if they are being forced to learn so that their souls are stressed. This situation gives rise to irritation, boredom, indifference, so that students' attention, interest and motivation becomes low.

The second problem is that the teaching staff is still not in line with the needs of the existing curriculum, for example in the implementation of the 2013 Kirikulm, the emphasis has been placed on the needs of students in the future, meaning that all that remains is for educators to collaborate with the government. This low capacity of teaching staff is in accordance with the opinion (Mustadi, 2020) that the existing staff is not optimal in accordance with the four teacher competencies.

Currently, there are still many teachers who tend to use conventional learning models, namely teacher-centered learning models. The teacher-centered learning process results in passive students in class and active teachers. Students are not directly involved in the learning process and the learning model is not appropriate. Most of the students' activities are just listening to the teacher's explanation, so students feel bored and less enthusiastic.

One of the lessons that is difficult to understand is science. Science in it discusses and relates to ways of finding out about nature systematically, so that science is not only mastery of a collection of knowledge in the form of facts, concepts or principles but is also a process of discovery. It is hoped that science education can become a vehicle for students to learn about themselves and the natural world around them, as well as prospects for further development in applying it in everyday life.

Based on the results of observations made by researchers at the beginning, the results of asking questions with the homeroom teacher of class VI showed that many students were still far from being determined. Documentation data on the UH (Daily Test) science grades of Class VI Cluster II Ledokombo odd semester students of the 2023/2024 academic year shows that 61.5% are below the Minimum Completeness Criteria (KKM), 23.1% have an average score of 80, which is above the KKM. . This shows that science learning outcomes are still relatively low.

Learning outcomes are the result of efforts or changes in behavior carried out by students, which results in increased experience and knowledge possessed by students through evaluation of learning outcomes. According to (Malisa et al., 2018) Learning outcomes are students' abilities obtained after learning activities. Due to this, the reality in the field is that there are still many Class VI elementary school students who think that science lessons are categorized as difficult subjects.

One way that the researcher will do this is that teachers need to provide variations in learning. So far, the learning carried out by teachers is still conventional, making students less active in learning activities. Teachers must be able to involve all students actively. To be able to actively involve all students in learning, teachers can start by implementing more varied learning models. One variation in the learning model that can be applied by teachers is the cooperative learning model.

Based on these problems, the CPS model has several characteristics that differentiate it from other learning models. The prominent characteristic of this model is that it uses problems as a learning resource and learning is carried out in group discussions (Van Hooijdonk et al., 2023). that in general CPS requires three thinking processes,

namely analytical, creative and critical. The key is to implement all three in the right order to solve the problem.

Learning with the CPS model begins with several problems, then students choose what will be discussed in the learning activity so they can determine the main problem (Laisema & Wannapiroon, 2014). Problems that are used as the focus of learning can be solved through group work so that students can provide various learning experiences such as cooperation and interaction in groups. Then students look for the problems that have been provided so that they can determine the solution to the problem that has been determined. This situation shows that the CPS model in learning requires readiness, both from the teacher and students. Teachers act as facilitators and guides, while students must be actively and independently involved in learning by optimizing their thinking abilities. In other words, the use of CPS can increase students' intelligence and foster a brave attitude in presenting themselves in learning.

Based on this description, it can be said that the CPS learning model is thought to have an influence on science learning outcomes. To prove this, this experimental research was carried out.

▪ METHOD

This research is a quasi-experimental research (quasi-experimental). According to (Cania & Setyanimgrum, 2013) experimental research is testing something to see the results. Apart from that (Sugiyono, 2018) also explained the same thing regarding experimental research which places more emphasis on product testing. The design of this research is an experimental research designed with a 2x2 factorial design. This research uses three variables consisting of one independent variable, one dependent variable and one moderator variable. The independent variable in this research is the Creative Problem Solving (CPS) learning model (A) as the treatment variable, the dependent variable is learning outcomes (Y) and the moderator variable in this research is multicultural attitudes (B).According to (Wapa, 2020) this design often used as an intact group such as a class, which makes randomization impossible

Population is the totality of all possible values, both the results of counting and measurement, quantitative or qualitative, rather than certain characteristics regarding a complete and clear set of objects (Martínez-Castilla et al, 2023) The population in this study were all grade VI elementary school students in Gugus II Ledokombo, Jember Regency who implemented K13 with a total of 334 students. The sample was determined using random sampling technique. This technique is used as a sampling technique because the individuals in the population have been distributed into classes so that it is not possible to randomize individuals or form new classes in the population. The research sample consisted of 120 students obtained by carrying out equality tests in each class and class VIA SDN 1 Lesung SDN III Lesung as the experimental class, class VIB SDN 1 Lembengan as the control class and class VIA SDN 2 Lembengan as the experimental class, class VB as a control class.

This research involves independent variables, dependent variables, and moderator variables. Independent variables are variables that influence or cause changes in the dependent variable. The independent variable in this research is learning using the CPS model, while the moderator variable is a supporting variable that has an influence on the dependent variable, namely multicultural attitudes. The dependent variable is the variable that is influenced or is the result of the existence of the independent variable. The dependent variable in this research is science learning outcomes.

The data in the research were collected using several methods according to the data demands of each research question and hypothesis that had been formulated. The data collection method used was to provide a multicultural attitude questionnaire before carrying out CPS learning and conventional learning treatment to the research sample. Meanwhile, to obtain data about students' science learning outcomes, it was obtained by giving a learning outcomes test after implementing CPS learning and conventional learning. Aspects of multicultural attitudes include developing cultural awareness and sensitivity, cultural tolerance, respect for cultural identity, responsiveness to culture, and skills to avoid and resolve conflict according to Lawrence J Saha (in Wapa, 2022).

This research uses instruments according to the type and nature of the data sought. The instrument grid is created by considering the characteristics of each data. The science learning outcomes instrument grid is guided by the curriculum foundation which concerns competency standards, basic competencies, material aspects and learning indicators. The student's multicultural attitude instrument grid was created by the researcher himself by referring to the grand theory of multicultural attitudes. Before this instrument was used, content validity and reliability tests were carried out. To determine content validity, expert judgment is carried out. The instruments that have been assessed are then tested in the field. The aim of testing the instrument is to determine the validity and reliability of the instrument, on science learning outcomes and multicultural attitudes.

The data that has been collected and analyzed uses prerequisite tests and hypothesis testing using ANOVA AB. Thus the data in this study are grouped into (1) science learning outcomes of students who follow the CPS learning model, (2) science learning outcomes of students who follow conventional learning, (3) science learning outcomes of students who follow the CPS learning model who have a high multicultural attitude, (4) science learning outcomes of students who follow the CSP learning model who have a low multicultural attitude, (5) science learning outcomes of students who follow conventional learning who have a high multicultural attitude, (6) science learning outcomes of students who follow conventional learning who have a multicultural attitude low. The entire analysis process is assisted by the SPSS 20.00 for Windows application

▪ RESULT AND DISCUSSION

The object of this research is the difference in students' science learning outcomes as a result of treatment between the implementation of the Creative Problem Solving model and conventional learning by considering students' multicultural attitudes. Calculation of central size (mean), data spread size (standard deviation)

Table 1. Capitulation of Science Learning Outcome Score Calculation Results

Statistics	A1	A2	A1B1	A2B1	A1B2	A2B2
Mean	85,90	75,89	92,65	80,05	78,55	71,79
Standard Deviation	7,86	6,60	5,74	7,04	6,74	4,22
Variance	61,84	43,55	32,89	49,61	45,42	17,84
Maximum Score	100,00	89,00	100,00	89,00	89,00	79,00
Minimum Score	68,00	65,00	83,00	69,00	68,00	65,00
Reach/Range	32,00	24,00	17,00	20,00	21,00	14,00

A1: Science learning outcomes with the CPS model.
A2: Results of conventional science learning.

A1B1: Science learning outcomes with the CPS model of high multicultural attitudes.
A1B2: Science learning outcomes with the CPS model of multicultural attitudes are low.
A2B1: Natural science learning outcomes from conventional learning with high multicultural attitudes.
A2B2: Science learning outcomes from conventional learning with multicultural attitudes are low

The average learning outcome score for students who took part in CPS learning (A1) was 85.90, which is categorized as very high. The average learning outcome following conventional learning (A2) is 75.89, including the high category. The average score for science learning outcomes that take part in CPS learning that has a high multicultural attitude (A1B1) is 92.65, which is in the very high category. The average score for science learning outcomes that take part in CPS learning with low multicultural attitudes (A1B2) is 78.55, which is in the high category. The average score for learning outcomes following conventional learning that has a high multicultural attitude (A2B1) is 80.05, which is in the very high category. The average score for learning outcomes following conventional learning with low multicultural attitudes (A2B2) is 71.78, which is in the high category.

The results of the normality test for data distribution were tested using the Kolmogorov-Smirnov technique with the help of SPSS 20.00 for Windows and had a significance figure greater than 0.05. So, all data distribution according to the learning model is normally distributed. The homogeneity test of learning outcomes produces a significance figure of 0.403, learning outcomes that have a high multicultural attitude produce a significance figure of 0.235. and learning outcomes that have low multicultural attitudes produce a significance figure of 0.063. Based on the analysis results, it appears that the resulting significance figure is greater than 0.05. Thus it can be concluded that the variables of science learning outcomes, learning outcomes that have high multicultural attitudes, and learning outcomes that have low multicultural attitudes are homogeneous.

Hypothesis testing in this research was carried out through statistical methods using the ANOVA AB formula. Furthermore, if it is known that there is an interaction between students' multicultural attitudes and social studies learning outcomes, then the Tukey test is carried out to determine which interaction effect is better. The results of the ANOVA AB calculation were carried out using the SPSS 20.00 program.

The results of the ANOVA AB analysis research with the help of SPSS 20.00 for windows showed that testing the first hypothesis, the null hypothesis was rejected and the alternative hypothesis was accepted (analysis results: "model" significance value (A) = 39.508) (Sig. < 0.050)). This means that there is a significant difference in science learning outcomes between students who take CPS learning, which is higher than students who take conventional science learning.

Testing the second hypothesis, the null hypothesis was rejected and the alternative hypothesis was accepted (analysis results: significance value of "multicultural model*attitude" (A*B) = 4.468 (Sig. < 0.050)). This means that there is a significant interaction effect between learning models in science learning and students' multicultural attitudes on students' science learning outcomes.

Testing the third hypothesis, the null hypothesis was rejected and the alternative hypothesis was accepted ($_{Qtable}$ (0.050) = 4.11, $_{Qcount}$ = 8.518, $_{Qcount>Qtable}$). This means that there is a significant difference between the science learning outcomes of students who

have high multicultural attitudes when they are given treatment using CPS learning and conventional learning.

Testing the fourth hypothesis, the nu hypothesis was rejected and the alternative hypothesis was accepted ($_{Qtable}$ (0.050) = 4.11, $_{Qcount}$ =4.237, $_{Qcount>Qtable}$). This means that there is a significant difference between the science learning outcomes of students who have low multicultural attitudes when they are given treatment using CPS learning and conventional learning.

The conventional learning model places more emphasis on the role of the teacher as a provider of information to students (teacher centered). In the learning process the teacher does not act as a facilitator and mediator but as an authority holder in learning, so that the learning process in the conventional learning model takes place under the control of the teacher so that students are passive and not active in learning activities. Students only act as recipients of knowledge informed by the teacher and then memorize it. The learning process tends to take place in one direction, namely from teacher to student. Students who have low multicultural attitudes are able to absorb and accept learning using this conventional model.

Learning with a creative problem solving model requires students to be active in the learning process. Students are given the opportunity to assimilate information by exploring and investigating a concept and then accommodating the information obtained by introducing the concept. Students who have low multicultural attitudes find it difficult to absorb learning using this learning model. Because students who have low multicultural attitudes are generally passive, lack curiosity, are less critical, are not diligent, get bored easily and are not motivated in the learning process

Based on the presentation of the research results, theoretically the use of cooperative models is more effective when used in learning, especially when directed at problem-based models, in accordance with the opinion (Zhang et al., 2023) that problem-solving oriented models will be more optimally used in the classroom because they train students to increase creativity himself.

Apart from that, it is also equivalent to research conducted by (Puspitasari, 2018) applying the CPS model which can help improve science learning outcomes because it has a more significant level of interest in learning so it can have an effect on increasing learning outcomes, namely in the first cycle students who completed it were 52.50% (21 people) , so there is an increase from the initial data with a percentage of 40.25%. In the second cycle the number of students who completed the percentage was 77.50% (31 people), and experienced an increase from the first cycle of 47.25%.

Apart from that, multicultural attitudes have a domain that is closely related to the CPS Model itself because this attitude makes it a unique thing that students have so that it can be a positive thing for collaborative work. This is in accordance with (Srikaew et al., 2015) opinion that multicultural attitudes can play an important role in improving results. learning and has a good correlation when compared with the CPS model.

Apart from that, it is also supported by research conducted by (Harefa et al., 2020). Applying the CPS model can help teachers improve students' discussion skills. Many things that students do begin to increase their activity and improve their skills, which makes science learning outcomes better than before. The increase that occurred in science learning outcomes was 70.15% (good) to 85.46% (very good).

▪ CONCLUSION

The data analysis design used is descriptive analysis and ANOVA AB analysis. Before testing the hypothesis, the analysis prerequisite tests are first carried out, namely the normality test and homogeneity test. Based on the presentation of research data conducted in cluster II Ledokombo, there are the following conclusions : There are differences in science learning outcomes between groups of students who take CPS and students who take Conventional, There is an interaction effect between the CPS model and conventional learning in terms of students' multicultural attitudes towards science learning outcomes, There are differences in science learning outcomes between the group that took CPS and the group that took conventional, for students who have high multicultural attitudes, There are different results between students who take CPS and students who take conventional students who have low multicultural attitudes

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