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The Influence of Problem Solving Learning Models on Numerical Ability in Class V Students of 1 Way Lunik Panjang Elementary School Bandar Lampung

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Abstract

The learning process is one of the keys to the success of education, where education is the development of potential in preparing students through learning and training activities for their future roles. In the learning process, educators are the main actors in how the learning process can be carried out, including in mathematics education in calculation material. The solution so that learning mathematics can be understood and not monotonous, for example using the problem solving learning model. The problem solving learning model will make students active by solving problems in their own way which is done together with group mates. This study aims to determine the effect of problem solving learning on the mathematical numeric abilities of class V SDN 1 Way Lunik Panjang Bandar Lampung. This study uses a type of quantitative experimental research, quasi-experimental type. The research design used was a pretest-posttest control group design. The results showed that after the researchers carried out data analysis and tested the hypothesis, namely: The use of the Problem Solving learning method had an influence on students' numerical abilities. So this shows the conclusion that there is an influence of the Problem Solving Method on the Numerical Ability of fifth grade students at SDN 1 Way Lunik Panjang Bandar Lampung.

Keywords: Learning Model, Problem Solving, Numerical Ability

INTRODUCTION

Humans are God's creatures that are perfect compared to other God's creatures, because humans have reason. The mind is used to think in an educational way. Education is basically the implementation of learning that has no limits, and ends at any time. The ongoing educational process in schools, especially at the elementary level (SD/MI) is the most basic level in formal education in Indonesia (Rika Norfika, 2017). Education is important for every individual to do and learn, because with education, the individual himself can develop in the mindset to compete in a world that is always changing times.

The learning process is one of the keys to the success of education, where education is developing potential in preparing students through learning activities and training for their future roles (Syofnida Ifrianti, 2017). According to Hasbullah, education is a science that discusses issues related to education (Saidah, 2016). National education is always being developed according to the needs both at the local and national levels as explained in Law no. 20 of 2003 concerning the national education system article 1 paragraph 1 states that: Education is a conscious, planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, personality, intelligence, noble character, and skills what he, society, nation and state need (Hasbullah, 2017).

In the learning process the educator is the main actor in how the learning process can be carried out, including in mathematics education in the calculation material which can be explained in the Al-Qur'an surah Al-Baqarah verse 261 which reads: "The parable of a person who spends his wealth in the way of Allah is like a grain which grows seven stalks, on each stalk there are hundreds of seeds. (Q.S. Al-Baqarah verse: 261)"

In the learning process, educators are the main actors in how the learning process can be carried out, including in mathematics education in calculation material. Although sometimes mathematics is still considered a science that is difficult to learn and understand by students, an educator must be more creative in using learning models and media in delivering material so that students can easily understand it. Most students in learning mathematics must think, students who have better numerical abilities are able to solve problems smoothly compared to students who have less numerical abilities (Agung Fitriyantoro & Budi Prasetyo, 2016).

Based on interview data with Mr. Iskandar Idris, S.Pd, as a fifth grade mathematics teacher on August 10, 2022, it was found that at SDN 1 Way Lunik, they still use conventional learning models, even though the teacher has used realistic mathematics education (RME) learning models. but not optimal, on the other hand the teacher finally reused the conventional learning model, namely the teacher explained the lesson accompanied by examples and then the students paid attention then worked on some of the questions that had been given by the teacher according to the examples respectively, the teacher said that there were still many class students V who did not understand material regarding numerical ability had an impact on student learning outcomes which were still low.

Based on the data on the value of student learning outcomes, there are several students who have not reached the minimum completeness criteria (KKM). The following learning outcomes data is displayed in the table:

Table 1. List of Grade V Student Report Cards at SDN 1 Way Lunik

Class	Skor (X)		Total
Va	10	12	22
Vb	12	10	22

Data Source: Grade V Grade List at SDN 1 Way Lunik, Panjang

Based on the data above, it is said that the Minimum Completeness Criteria (KKM) in the numerical ability of students in mathematics is 65. There are 23 students in class Va who have scores above the KKM totaling 12 people and those who get the same score as the KKM is 5 people while students who have not reached KKM are 6 people, for class Vb 23 people who achieve KKM scores are 13 while those who have not reached KKM scores are 10 people.

The low value of report cards is suspected, because teachers need enrichment and apply appropriate learning models so that learning becomes optimal, and not only use lecture methods such as assignments, question and answer, and notes so that students will feel bored, bored, and pay less attention to lessons over time explained by the teacher.

This can be seen during observations in class V when the teacher explained the mathematics lesson on the KPK and FPB numbers. The researcher saw that there were some students who did not pay attention and were busy with their own activities such as playing, sleeping, talking with their desk mates, playing letters and drawing. This is because students have felt afraid from the start, knowledge that is difficult to master, boring, and makes students dizzy. This is the reason why students are less than optimal in participating in mathematics learning.

Especially when calculating operations multiplication, division, addition and subtraction. this is because there are some students who have not memorized multiplication and division, but there are also those who are not careful when counting. students find it difficult to do tasks that are not the same as the example questions explained by the teacher. students lack self-confidence and are still passive in critical thinking as there are other methods (ways) to do the tasks given by the teacher and students feel bored and bored without question and answer during the lesson.

So that the numerical ability of students in following lessons, especially mathematics, is still low. This is because learning at SDN 1 Way Lunik Panjang still rarely uses learning models, causing low students' numerical abilities in mathematics lessons. It is hoped that educators can use and choose the right learning model in each learning process, so that it can be expected to increase enthusiasm. learning and numeric skills. (Iskandar Idris, 2022).

The solution so that learning mathematics can be understood and not monotonous, for example using the problem solving learning model. The problem solving learning model will make students active by solving problems in their own way which is done together with group mates. The problem solving learning model according to Polya is a learning model that uses high-level thinking, to solve various problems based on accurate data or information, so as to produce the right conclusions (Isrok'atun & Amelia Rosmala, 2019).

Based on these facts, this research has the novelty of problem solving on students' numerical abilities that can be known from exercises in the form of essays, because with essay questions students can describe their answers so that educators can find out the development of students' numerical abilities when solving a problem. so that the knowledge and numerical abilities possessed by students can be measured. This study aims to determine the effect of problem solving learning on the mathematical numeric abilities of class V SDN 1 Way Lunik Panjang Bandar Lampung.

RESEARCH METHODS

Research Design

This study uses a type of experimental quantitative research, namely with a study in which at least one variable is found that is manipulated to study cause and effect. This study used a quasi-experimental type of experiment, namely this study had a control group and an experimental group, but the control group did not fully function to control the variables that occurred in the experimental group. The research design used was a pretest-posttest control group design. In this design, there are two groups that are randomly selected and then given a pretest to find out if there is a difference in the initial state between the experimental group and the control group.

Table 2. Quasy Experimental Research Design

Kelompok	**Pre-Test**	**Action**	**Post-Test**
Eksperimen	O_1	X_1	O_2
Kontrol	O_3	X_2	O_4

Place and Time of Research

This research was conducted at SDN 1 Way Lunik, Panjang district, Bandar Lampung. Researchers conducted research in class V SDN 1 Way Lunik Panjang Bandar Lampung. The research was carried out in the even semester of the 2021/2022 academic year.

Data Collection Technique

Technique is a method, while data is the result of research recording which contains facts and figures. So, data collection techniques are ways in which a researcher can collect information for the results of his research, data collection techniques using test techniques from pretest and posttest, as well as documentation.

RESEARCH RESULTS AND DISCUSSION

In this study, it contained data on instrument trials and data on the results of the numerical abilities of fifth grade students at SDN 1 Way Lunik Bandar Lampung. The following is a description of the data that will be described as follows:

Instrument Trial Results

In the research, data on testing instruments resulting from numerical ability, in the matter of multiplication and division of mathematical fractions, consisted of 15 essay questions, which had been conducted at SDN 1 Way Lunik Panjang Bandar Lampung in the 2022/2023 academic year. This trial was carried out outside the research sample, namely 22 students in class Vc. The trial test was carried out on November 24, 2022. So that the results of the validation, that the 15 test items left 10 trial items were feasible and could be used.

Based on the results of the calculations that have been tested, the results of the validation of the test items on 15 items show that 10 items are classified as valid because rcount > rtable, namely on item numbers 1,2,4,5,7,8,10,11,13 and 15 while 5 items are classified as invalid because rcount < rtable, namely 3,6,9,12 and 14 so that the 5 questions are not used.

Difficulty Level Test

Based on the table of difficulty level calculation results, out of the 10 questions tested, there are 4 easy questions, namely questions no.1,2,8, and 11. Meanwhile, the items that are classified as medium consist of 6 questions, namely questions no.4,5, 7,9,10 and 13. The complete calculation of the difficulty level of the test items for the numerical ability test of students can be seen in the appendix.

Test the Power of Different Items

Based on the results of the analysis of the differential power test, it can be seen that there are 4 items that are classified as good in item no.1,2,8 and 11 and 6 questions that are classified as very good in item no.4,5,7,9,10 and 13 The complete calculation of the different power test for the test questions for students' numerical ability test can be seen in the appendix.

Based on the results of the calculation of the reliability test of 10 test items on the numerical ability test, the value of r11 = 0.83 was obtained. the value of r11 is then compared to the value of 0.70. Based on these results it can be concluded that r11 ≥ 0.70, so that the test instrument is said to be reliable and has consistency in measuring samples and is feasible for use in numerical ability data collection. Calculation of the reliability of students' numerical ability tests can be seen in the appendix

Conclusion of Numerical Ability Test Trial Results

Based on the validity calculation table, difficulty level, differential power and item reliability, of the 15 items tested by the researcher, the researcher used questions that were already reliable, namely 10 questions that had a test level that met the expected test criteria, thus the test used to taking data on students' numerical ability has fulfilled content validity with a reliability index of 0.83.

Pre-Requirement Test

Normality Test

The normality test is used to find out whether the data obtained by the researcher is normally distributed data or not. The Ltsbel value is taken based on the value in the L crisis table for the Liliefors test at the level of 0.05 (5%), thus the decision column is made based on the normality test provisions, ie Lcount<Ltable then the data is normally distributed. Conversely, if the decision is made from the coefficients Lcount>L table, the data is not normally distributed. The data analysis using the normality test can be seen in the following table:

Table 3. Numerical Ability Pretest Normality Test

Characteristic	Class		Result	Interpretation
	Experiment	Control		
L_{hitung}	0.126	0.128	$L_{hitung}<L_{table}$	Normal Distribution
L_{table}	0,19	0,18		

Table 4. Numerical Ability Posttest Normality Test

Characteristic	Class		Result	Interpretation
	Experiment	Control		
L_{hitung}	0.158	0.133	$L_{hitung}<L_{table}$	Berdistribusi Normal
L_{table}	0,19	0,18		

Based on the table of normality test pretest and posttest obtained pretest Lcount 0.126 and Ltable 0.19 = Lcount < Ltable (0.126 <0.19) obtained posttest Lcount 0.158 and Ltable 0.19 = Lcount < Ltable (0.158 <0.19) in the experimental class , obtained pretest Lcount 0.128 and Ltable 0.18 = Lcount < Ltable (0.128 <0.18) obtained posttest Lcount 0.133 and Ltable 0.18 = Lcount <Ltable (0.133 <0.18) in the control class. Thus the pretest and posttest normality tests in both the experimental and control classes obtained normal data distribution results because Lcount < Ltable.

Homogeneity Test

Homogeneity test was carried out to find out whether the data obtained has a homogeneous variant or not. The variance similarity test is carried out on the dependent variable data by using the F test. The homogeneity test is based on the homogeneity test provisions, namely if the Fcount value <Ftable then it is stated that both data have homogeneous variants, otherwise if Fcount> Ftable then it is stated that both data have non-homogeneous variants . The data analysis using the homogeneity test can be seen in the following table.

Table 5. Pretest Homogeneity Test Results

Characteristic	Class		Result	Interpretation
	Experiment	Kontrol		
F_{hitung}	1.322		$F_{hitung}< F_{tabel}$	Homogeneous
F_{table}	2.108			

From the data above, the results of the pretest homogeneity test for the control and experimental classes obtained Fcount = 1.322 < Ftable = 2.108. Thus testing the homogeneity of the pretest in both the experimental class and the control class obtained the results of Fcount < Ftable so that it can be concluded that the similarity test of the two variables has the same (homogeneous) properties. After the normality test and homogeneity test are fulfilled, statistical calculation analysis can be continued by testing the research hypothesis using the t-test.

Table 6. Posttest Homogeneity Test Results

Characteristic	Class		Result	Interpretation
	Experiment	Control		
F_{hitung}	1,275		$F_{hitung} < F_{tabel}$	Homogeneous
F_{table}	2,108			

From the data above, the results of the pretest homogeneity test for the control and experimental classes obtained Fcount = 1.322 < Ftable = 2.108. Meanwhile, the results of the posttest homogeneity of the control and experimental classes obtained the value of Fcount = 1.275 <Ftable = 2.108. Thus testing the homogeneity of the pretest and posttest in both the experimental class and the control class obtained the results of Fcount < Ftable so that it can be concluded that the similarity test of the two variables has the same (homogeneous) properties. After the normality test and homogeneity test are fulfilled, statistical calculation analysis can be continued by testing the research hypothesis using the t-test.

Hypothesis Test (t-test)

After the normality test was carried out and the sample was normally distributed and the homogeneity test showed that the sample came from a homogeneous variant, it was continued with a hypothesis test which was carried out by comparing student learning outcomes between control and experimental classes using the t test. Hypothesis testing was carried out to see whether there were differences in the pretest and posttest results of students from the experimental and control classes and groups. As the results can be seen in the following table:

Table 7. Pretest Hypothesis Test Results for Numerical Ability Results in the Experimental and Control Classes

Characteristic	Class		Result	Interpretation
	Experiment	Kontrol		
t_{hitung}	0,308		$t_{hitung} < t_{tabel}$	H_1 ditolak
t_{table}	2,021			

Source: Data Processing (Calculations in Appendix)

Berdasarkan perhitungan diatas didapatkan hasil perhitungan uji t pretes t_{hitung} 0,038 < t_{table} 2,021 dengan demikian kriteria pengujian $t_{hitung} > t_{tabel}$ maka hasil dari perhitungan uji t pretest H_1 ditolak yang artinya menunjukkan bahwa tidak ada pengaruh model pembelajaran *teams games tournament* terhadap hasil kemampuan numerik peserta didik pada mata pelajaran matematika kelas V SDN 1 Way Lunik,Panjang, Bandar Lampung.

Table 8. Posttest Hypothesis Test Results Value of Numerical Ability Results in Experimental and Control Classes

Characteristic	Class		Result	Interpretation
	Experiment	Control		
t_{hitung}	2,183		$t_{hitung} > t_{tabel}$	H_1 diterima
t_{table}	2,021			

Source: Data Processing (Calculations in Appendix)

Based on the calculation above, the results obtained from the calculation of the t pretest test tcount 0.038 < ttable 2.021 and the results of the posttest t test calculations tcount 2.183 > ttable 2.021 thus the testing criteria for tcount > ttable then the results of the calculation of the t posttest H1 test are accepted, which means that there is an influence of the Problem Solving learning model on results of students' numerical ability in mathematics class V at SDN 1 Way Lunik, Panjang, Bandar Lampung.

Discussion

The researcher wants to prove that using Problem Solving learning is better than using the Time Games Tournament learning model. In this study, there are two variables that are the object of research, including the independent variable, namely Problem Solving learning and the dependent variable resulting from numerical ability. This study used two classes, namely the Va class with a total of 22 students as the control class with Time Games Tournament learning and the Vb experimental class with a total of 22 students using Problem Solving learning on fraction material in the form of multiplication and addition.

Hypothesis testing data were collected by researchers by teaching fractional material about multiplication and addition in the experimental class and the control class, each of which was carried out for 3 weeks in 5 meetings consisting of 3 teaching and learning processes and 2 times to do the pretest (at the beginning of the meeting before giving treatment) and posttest (at the end of the meeting after finishing giving treatment) to find out the results of students' numerical abilities.

The questions used were previously tested to obtain results, validation, reliability, and level of difficulty. The samples used for the trials were classes outside the experimental and control classes, namely class Vc, which consisted of 22 students with item analysis related to the feasibility test with the number of questions as many as 10 essay questions for pretest questions and 10 essay questions for posttest questions. Questions that have been valid are then used to test the numerical abilities of students using Problem Solving and Time Games Tournament learning.

The data analysis used in this study came from normality tests and homogeneity tests which were carried out based on the results of the pretest and posttest of each class. The normality test uses the Liliefors test with the knowledge that L0 = 0.126 for the experimental class pretest and L0 = 0.128 for the control class pretest, L0 = 0.158 for the experimental class posttest and L0 = 0.133 for the control class posttest, and the significance level used from the two classes Ltable = 0.19 for the experimental class and Ltable = 0.18 for the control class so that it is normally distributed because L0 < Ltable.

The next analysis is the homogeneity test which aims to see whether the variances of the populations are the same or not. Variant testing in the homogeneity test was carried out using the Microsoft Office Excel program. The results of testing the homogeneity test with a significance level of α (5%) obtained significant data on mathematics learning outcomes Ftable, Fcount in the pretest of the experimental class and control Fcount in the posttest of the experimental class and control. It can be concluded that Ftable <Fcount, then H0 is accepted, which means that the two populations have the same or homogeneous variance.

After using the learning described, the results of students' numerical abilities with Problem Solving learning were better. Based on data analysis and hypothesis testing, a tcount of 2.183 is obtained while ttable is 2.021 which means tcount > ttable. In conclusion, H0 which states that the results of students' mathematical numerical abilities using Problem Solving learning are not better than the results of mathematical numerical abilities using Time Games Tournament learning are rejected. so that H1 which states that the results of mathematical numerical abilities with Problem Solving learning are better than the results of mathematical numerical abilities using Time Games Tournament learning are accepted.

Based on the results of the analysis of the learning outcomes data obtained from the results of the students' pretest and posttest scores, it shows that the use of the Problem Solving learning model can improve the results of students' numerical abilities. The results of the proof of the research hypothesis, show the interaction between the Problem Solving learning model and the results of students' numerical abilities, namely the learning process related to multiplication and division of fractions. If multiplication and division of fractions is taught through lecture learning and has not optimally utilized the potential of the environment around students, then students only function as objects, without being able to develop themselves and the environment as a learning resource is not utilized optimally. Therefore, we need a learning model that can foster a learning atmosphere that is not boring and students get real examples of the material being studied so that students can apply it in their daily lives.

The application of the Problem Solving learning model makes students active and think critically about questions given by educators, both independently and in groups because in the learning process students are faced with various problems related to the material, students must think to find solutions. then, students carry out group discussions in their respective groups, besides that students can also dig up information from relevant textbooks and use the internet to facilitate the learning process.

In the learning process the educator also asks about students' understanding of the material that has taken place. The high average learning outcomes of students in the experimental class using Problem Solving. Because Problem Solving has advantages and advantages to increase student activity, make the learning process more focused, in improving numeracy skills. The benefits of Problem Solving include increasing student learning activities and academic processes, helping students increase self-confidence, helping to improve relationships between students and in learning students will be more active, because there will be a reward given to the group that answers questions correctly and precisely.

CONCLUSION

The conclusions obtained after the researchers conducted data analysis and tested the hypothesis, namely: The use of the Problem Solving learning method has an influence on students' numerical abilities. So this shows the conclusion that there is an influence of the Problem Solving Method on the Numerical Ability of fifth grade students at SDN 1 Way Lunik Panjang Bandar Lampung.

Suggestion: researchers are expected to be able to apply the Problem Solving learning model to other materials so that they can improve students' numerical abilities, so in teaching and learning students understand the steps for solving problems, are not passive and will generate curiosity in learning, especially mathematics so that the participants' academic value education can be improved.

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