

Research design



Figure 1: Research method

Adopted (Tjandra, 2023)

This research uses quantitative methods with experimental types. The quantitative approach is used to research and produce data based on numbers that are carried out objectively. In obtaining data and aims to determine students' ability to solve problems. The data obtained comes from the test questions that have been given.

Research subject

The subjects of this study were fifth grade elementary school students of SDN 188 Gresik, using saturated sampling. The research subjects consisted of 25 students. Researchers use this technique because researchers want to make generalizations with very small errors.

Instrument and indicator

This research instrument uses tests, because it measures students' ability in problem solving. Written tests are used as written data on student work on selective problem solving test questions, written tests in the form of 5 question items.

Table 1. Problem-solving Skill Test

No	Problems
1.	Siti bought 2 pencils, 3 notebooks, 1 eraser, and 1 ruler. If the price of 1 pencil is Rp1,500. The price of 1 book is Rp1,000.00 more than the price of a pencil. The price of 1 eraser is Rp1,000. The price of 1 ruler is the same as 1 book. Siti paid with 2 ten thousand notes, then the refund is?
2.	Ratna bought 4 pencils, 2 ballpoint pens, 2 erasers, 2 rulers, and some notebooks. The price of each pencil is Rp2,000.00, the ballpoint pen is Rp3,000.00, and the eraser is Rp2,000.00 cheaper than the ballpoint pen. The ruler costs Rp1,000.00 more than the pencil and each notebook costs Rp2,000.00. Ratna paid with two twenty-thousandth notes and got Rp4,000 back. How many notebooks did she buy?
3.	Mr. Salam has 2 material stores in material 1 there are 290 packs of ceramics, Mr. Salam plans to move all the ceramics to material store 2, then Mr. Salam's men bring 100 packs of ceramics to move to material store 2. How many more have not been moved?
4.	Five chicken eggs cost Rp6,000. What is the price of 15 chicken eggs?
5.	Two kg of shallots costs Rp5,000, find the price of 4 kg of shallots!

Regarding the ability to solve the problem of mathematics students before and after being given treatment in the form of selective problem solving learning. The test was given to students through a math problem solving instrument. To measure students' ability, researchers used scoring based on Polya's solve the problem steps in table 1.1. Furthermore, to interpret the problem solving ability, researchers converted the total student score to the value interval 0-100.

Table 1. Problem-solving skill scoring rules

Aspects	Reaction to problems	Score
Understanding the problem	- Does not understand the problem/no answer	0
	- Not observing the problem conditions/interpretation of the problem is not correct	1
	- Not wrong answer	2
Planning the solution	- No solution strategy plan	0
	- Strategy is not relevant	1
	- Using one particular strategy but cannot proceed/missteps	2
	- Using one particular strategy but leads to the wrong answer	3
	- Using several correct strategies that lead to the correct answer	4
Implement settlement	- No solution at all	0
	- There is a solution, but the procedure is not clear	1
	- Using one specific procedure that leads to the correct answer	2
	- Using one particular procedure that is correct but incorrect in the calculation	3
	- Using a specific correct procedure and the correct result	4
Rechecking the answer	- Not checking of answers	0
	- Checking only on the answer (calculation)	1
	- Checking only on the process	3
	- Checking both the process and the answer	4

Adopted (Amir, 2015)

From table 2 with a value interval of 0-100, the researcher can classify the level of problem solving ability based on the score obtained by students in solving the problem in table 3.

Table 2. Problem-solving skill level

Score Intervals	Skill Levels
$69 < L \leq 100$	Able
$40 < L \leq 69$	Quite capable
$0 \leq L \leq 40$	Not capable

Description:

L = Problem-solving skill level

Research procedure

This research procedure follows the steps of data collection by giving tests. The first step is that the researcher provides an explanation of the test word problems. The second step is giving the test to all students then answering the word problems test questions that have been given.

Data analysis

Before analyzing the hypothesis test data to determine whether or not there is an effect after being given treatment in the form of selective problem solving learning on problem solving skills, researchers will conduct a pre-requisite test, namely the data normality test to determine whether the population where the problem solving ability data is taken is normally distributed. Hypothesis testing used by researchers using the t-test formula. Selective problem solving learning is said to have an effect on problem solving ability if $t_{count} > t_{table}$ at a significant level of 5%, otherwise if $t_{count} < t_{table}$ at a significant level of 5% then selective problem solving learning is said to have no effect on solving ability. To determine the level of ability of selective problem solving learning on problem solving ability. Convert the price of t to the category of influence level.

Result and Discussion
Result

Based on the results of student work obtained from 25 students, 4 students scored 24, 3 students scored 40, 1 student scored 52, 2 students scored 64, 13 students scored 68 and 2 students scored 72.

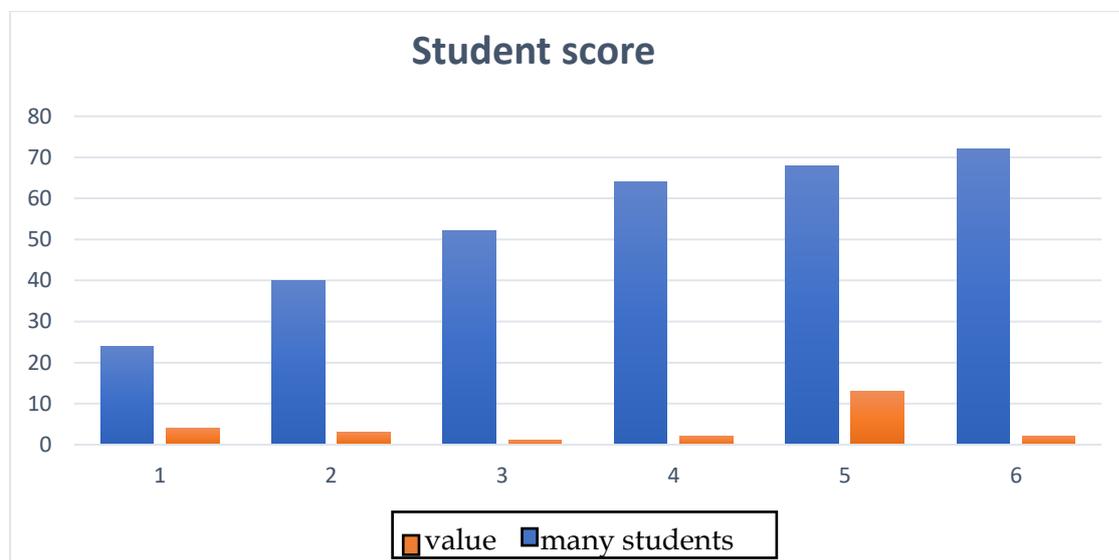


Figure 2. Student score result

The results of data analysis to determine whether or not there is an effect of selective problem solving learning can be seen in Table 4.

Table 4. Selective problem solving learning on the skill to solve word problems

Description	Postest	t_{count}	t_{table}
Totally score	1620	4.102	2,0930
Average score	68,9		
Level	Able		

In Table 4, the average posttest score of students is 68.9, meaning that students' average problem-solving skill is at a capable level before being given treatment in the form of selective problem solving learning.

This can interpret that there is an increase in students' abilities after being given treatment in the form of selective problem solving learning.

The results of the calculation of the t-test formula obtained t count of 4.102, while the ttable value at a significant level of 5% is 2.0930. $t_{count} > t_{table}$ at a significant level of 5% is 2.0930, it can be concluded that $t_{count} > t_{table}$ which means selective problem solving learning has an effect on student abilities.

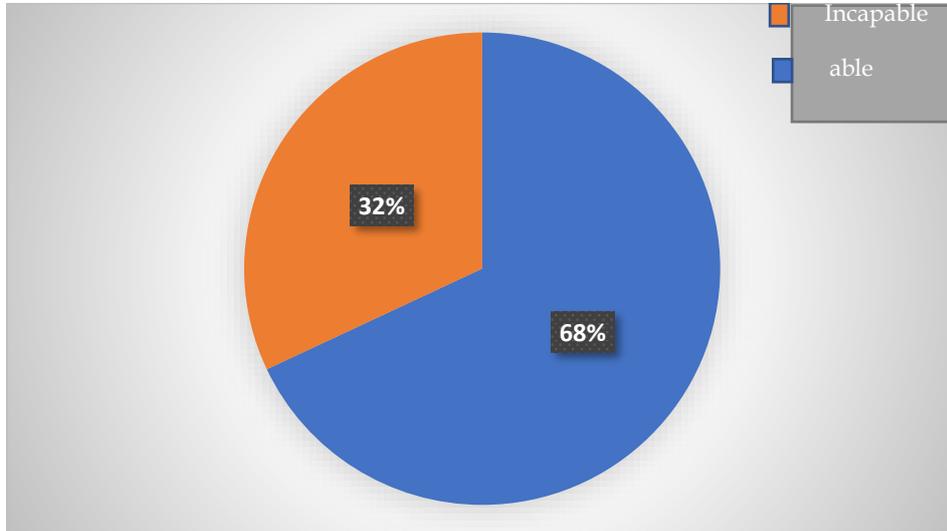


Figure 3. Student work

According to research that has been conducted from 25 students, 68% of students were able to solve posttest questions and 32% of students were unable to solve selective problem solving posttest questions. Students who are able to solve problems by understanding word problems that have been given by researchers and can answer according to the instructions that have been given. Students who are unable to have difficulty in understanding the word problems given, so that students cannot solve the instructions given by the researcher.

Table 5. Recapitulate Problem-solving skill

		P1	P2	P3	P4	P4	Total
P1	Pearson Correlation	1	.042	-.502*	-.179	-.255	-.060
	Sig. (2-tailed)		.843	.011	.391	.218	.775
	N	25	25	25	25	25	25
P2	Pearson Correlation	.042	1	.303	.179	.510**	.625**
	Sig. (2-tailed)	.843		.141	.391	.009	.001
	N	25	25	25	25	25	25
P3	Pearson Correlation	-.502*	.303	1	.289	.390	.642**
	Sig. (2-tailed)	.011	.141		.161	.054	.001
	N	25	25	25	25	25	25

P4	Pearson Correlation	-.179	.179	.289	1	.000	.724**
	Sig. (2-tailed)	.391	.391	.161		1.000	.000
	N	25	25	25	25	25	25
P5	Pearson Correlation	-.255	.510**	.390	.000	1	.461*
	Sig. (2-tailed)	.218	.009	.054	1.000		.020
	N	25	25	25	25	25	25
Total	Pearson Correlation	-.060	.625**	.642**	.724**	.461*	1
	Sig. (2-tailed)	.775	.001	.001	.000	.020	
	N	25	25	25	25	25	25

*. Correlation is significant at the 0.05 level (2-tailed). P1-P5 = Problem 1 – Problem 5

** . Correlation is significant at the 0.01 level (2-tailed).

The total column indicates the validity of each item. Based on the r table, the minimum Pearson Correlation value is .724 because it uses 25 respondents (N) with a limit of 0.05. It can be seen that all Pearson correlation values for each item are above .724. This is indicated by the ' or " sign in the Total column in the output table. So that these 5 post-test items are valid, these results show the validity of the data results.