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IMPROVING STUDENTS' ABILITY IN SOLVING STORY QUESTIONS THROUGH A SCIENTIFIC APPROACH WITH ZOOM MEDIA

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ABSTRACT
This study aims to improve students' ability to solve story problems through aapproach *scientific* usingmedia *zoom*. This study used experimental methods and analyzed using the N-Gain test. The instrument used is a problem-solving ability test. The population in this study was class VIII semester I SMP Negeri 11 Bengkulu City for the Academic Year 2020/2021, with the research sample being class VIII.E totaling 20 people. The results showed that there was an increase in the ability to solve story problems for students who were taught using aapproach *scientific* throughmedia *zoom* with an N-gain value of 0.67. The average value of students' ability to solve story problems taught using aapproach *scientific* throughmedia is *zoom* 76.50.
Keywords: Approach *Scientific,* Story questions

1. Introduction

In 2021, the National Examination will be changed to Assessment As National which measures three main components, namely Competency Assessment Minimum (AKM), Character Survey, and Learning Environment Survey. According to Minister Nadiem, AKM is a benchmark for better assessment comprehensive to measure the minimum ability of students. AKM it self consists of literacy and numeracy skills tests.

The numeracy AKM questions are usually in the form of story questions involving mathematical concepts, where students are required to have the ability to understanding of concepts, reasoning and problem solving skills. until like it or not, teachers must train students' problem-solving skills to solve story problems.

Story questions are one of the representations of ability problem solving (Poyla, 1957). In general, problem solving questions are presented in the form of contextual story questions, where the questions are based on students' real lives. In solving story problems, students must study and understand the problem, prepare a plan/determine the formula or what strategies are used to solve the problem, carry out plans / apply formulas or strategies in solving problems, and can double-check their answers. The four steps it is an indicator of problem solving ability (Polya,

1957). Problem solving ability is an ability that students need to be able to solve the problems encountered in learning and in daily life. So that ability is very important owned by students.

The importance of problem solving skills is also stated in Minister of Education and Culture No. 22 of 2016 and NCTM (2000) which states that The objectives of learning mathematics are (1) understanding mathematical concepts, (2) problem solving, (2) mathematical reasoning, (3) mathematical communication, (4) mathematical connections, and (5) mathematical representation.

However, the reality is that at SMPN 11 Bengkulu City, grade VIII students still very difficult to understand about the story let alone solve problems in story matter. This can be seen from the results of the daily test in the form of questions story. There are still many students who have not finished.

The low problem solving ability of students will have an impact on the low learning achievement of students at school. According to Yulfitri, Haji, and Nirwana (2019), the root cause of the low problem-solving ability is the lack of precise use of learning models. The way to anticipate this problem so that it is not sustainable, of course it is necessary to find an appropriate learning formula so that it can increase student activity in learning mathematics. Teachers as teachers and facilitators must be able to carry out learning that makes students active and able to solve problems, especially for story questions so that maximum results will be obtained. One of the steps that can be undertaken by teachers as mentors to students is to choose an effective approach to learning, making students more active in the learning process.

One of the scientific approaches suggested in implementing the 2013 curriculum in schools is theapproach *scientific*. The Ministry of Education and Culture provides its own conception that the scientific approach in learning includes components: observing, asking, trying, processing, presenting, concluding, and creating. These components should be raised in every learning practice, but it is not a learning cycle (Waseso, 2018). Waseso (2018) also explains the components of theapproach, *scientific* namely: (1) Observing; The method of observing prioritizes the meaningfulness of the learning process (*meaningful learning*). This method has certain advantages, such as presenting real media objects, making students happy and challenged, and easy to implement. The result of this activity is that students can identify problems. (2) Asking; When the teacher asks, at the same time he guides or guides his students to study well. When the teacher answers the students' questions,

at the same time he encourages his upbringing to be a good listener and learner. The result of this activity is that students can formulate problems/hypotheses. (3) Reasoning; Reasoning is a logical and systematic thinking process on empirical facts that can be observed to obtain conclusions in the form of knowledge. (4) Tried; To obtain real or authentic learning outcomes, students must try or experiment. By trying, it is hoped that in this activity students can test hypotheses. Furthermore, students can conclude the results of problem solving that they have done.

Theapproach *scientific* has been proven to improve student achievement, such as the research conducted by Trihasari, Haji and Nirwana (2019) which stated that there was a linear effect of the covariate of initial problem-solving ability on the final problem-solving ability of students who were taught using themodel *Problem Based Learning* with aApproach *Scientific*. By Therefore, learning activities with aapproach *scientific* is expected to make students actively in learning.

However, during the current COVID-19 pandemic, it is not possible to do face-to-face learning, so learning with aapproach *scientific* is carried out through thelearning application *Zoom.* Through *zoom,* teachers and students can still learn directly even though they are *online*. The application *zoom* is one application that can be used for free with quotas from the Ministry of Education and Culture, so students can easily use it. Through *zoom,* teachers and students can carry out learning without being limited by space and time. Learning can be done anytime and anywhere. So that student learning outcomes are expected to be more optimal.

Based on the description above, the researcher hopes that one way to improve problem solving skills is to use aapproach *scientific* throughmedia *zoom*. Through aapproach *scientific* students will be trained not to fully depend on learning activities on the teacher, so that student learning independence will emerge. Students will be encouraged to be active in learning, challenge them to think, and create a fun learning process. Theapplication *zoom* also allows students to directly express opinions/answers to teacher questions and can discuss with other friends. Finally, students are able to apply the knowledge they gain in everyday life. The purpose of this research is "To improve students' problem solving skills in solving story problems through aapproach *scientific* usingmedia *zoom*".

2. Method

This research method uses an experimental method and the type of research uses a *pre-experimental design*, namely a design that is not yet a real experiment because there is no control variable (Sukestiyarno, 2020: 279). Research withapproach *pre-experimental design* selectedis one group pretest-posttest*(onegroup pretest-posttest*design).In this design, the subjects before being treated were given a pretest. The research design is described in table 1 below:

Table 1. Research Design
Pre-experimental design form

Pre-Test-Test	Treatment	Post
$\mathbf{Y_1}$	**X**	$\mathbf{Y_2}$

Description:
$\mathbf{Y_1}$ = Giving the test before the material is given
$\mathbf{Y_2}$ = Giving the test after the material is given
X = Treatment (with aapproach *scientific* throughmedia *zoom*)

The hypothesis test of this study uses the N-Gain test with the help of SPSS MB 23. The instrument used is a problem-solving ability test. This research was carried out at SMP Negeri 11 Bengkulu City for the 2020/2021 academic year. The researcher took class VIII in the first semester of the 2020/2021 academic year as the research population. The sample class used is class VIII.E SMP Negeri 11 Bengkulu City. The data collection technique used in this study was a test sheet. The research instrument used was a test of students' problem-solving abilities. The form of the test used in this study is an essay form. This form of test is given to measure students' problem solving abilities in solving story problems.

Analysis of students' problem-solving ability tests using the following assessment:

N = Sum of all scores obtained from all questions

Calculating the percentage of KPM indicators using the formula:

Percentage of achievement = $\frac{Rata-Rata\ Skor}{Skor\ Maksimal} x\ 100\%$

Analysis of problem solving ability is presented in detail for each indicator to see clear results for each indicator. The score for each of the indicators is obtained from the results of the assessment of each student's answer on the problem-solving ability test in the form of an essay. The maximum score for

problem-solving skills for 6 questions is 100 and the lowest score is 0. The maximum score for each indicator of understanding the problem is 9, preparing a plan / solution strategy is 16, executing the plan / solving the problem is 55, and checking the answers again is 20. Data The results obtained from the data analysis are then converted into value categories and can be seen in table 2 below.

Table 2. Category of Problem Solving Ability (KPM)

Score	Category
$81 \leq KPM \leq 100$	Very Good
$61 \leq KPM \leq 80$	Good
$41 \leq KPM \leq 60$	Fairly
$21 \leq KPM \leq 40$	Poor
$0 \leq KPM \leq 20$	Very Poor

To find out the improvement in students' problem solving abilities measured, the calculation of the normalized gain average score data (N-Gain) developed by Hake (1999) with the following formula:

$$\langle g \rangle = \frac{S_{post} - S_{pre}}{S_{m-ideal} - S_{pre}}$$

Description:

$\langle g \rangle$ = Average score of normalized gain
S_{post} = Average score of student's final test
S_{pre} = Average score of student's initial test
$S_{m-ideal}$ = Ideal maximum score

The average value of N-gain that has been obtained is then interpreted based on table 3 below.

Table 3. Interpretation of N-Gain

Score $\langle g \rangle$	Criteria
$\langle g \rangle \geq 0{,}7$	High
$0{,}3 \leq \langle g \rangle < 0{,}7$	Medium
$\langle g \rangle < 0{,}3$	Low

(Hake, 1999)

3. Results and Discussion

Description of Data

The lowest pretest score is 5.00 and the highest score is 70.00. For the average value of 27.85 with a standard deviation of 18.178. As for the post-test value, it can be seen that the lowest value is 36.00 and the highest value is 95.00. For the average value of 76.50 with a standard deviation of 16,769. The data can be seen

from table 4 below.

Table 4. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Eksperimen	20	5	70	27.85	18.178
Post-Test Eksperimen	20	36	95	76.50	16.769
Valid N (listwise)	20				

Analysis of Student Problem Solving Ability

Analysis of student problem solving ability in solving story problems is presented in detail from the four indicators presented in Figure 1 below:

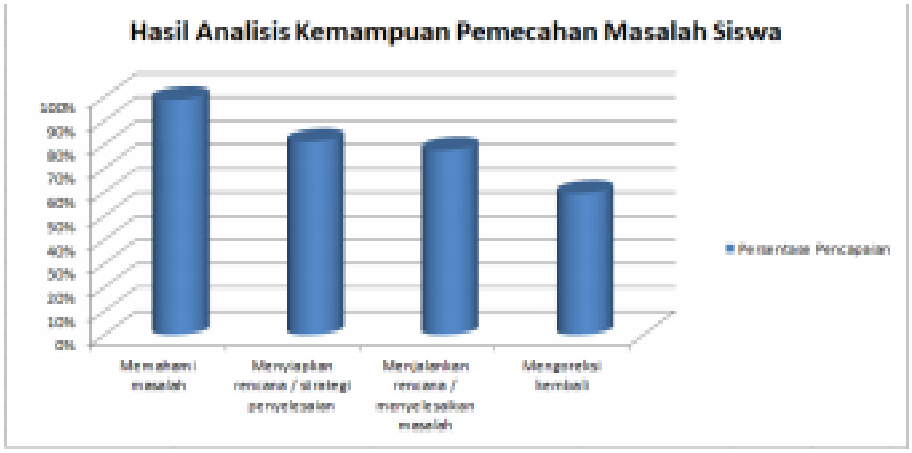


Figure 1. Results of Analysis of Problem Solving Ability

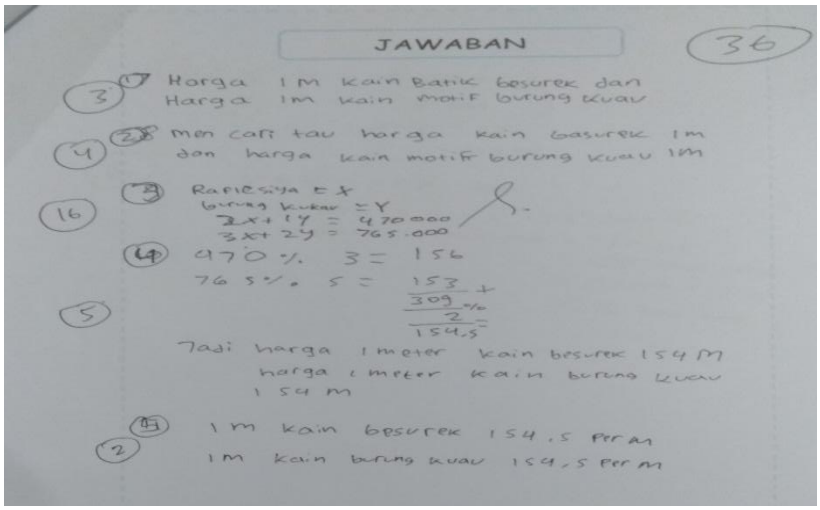
Based on Figure 1 shows the score of students' problem solving ability on the indicator of understanding the problem obtaining a percentage an average value of 99% with a very good category. Furthermore, on the indicator of preparing the plan, the percentage of the average value is 81% with a very good category, and on the indicator of running the plan / solving problems, the percentage of the average value is 78% in the good category. Next on the indicator check again obtained the percentage of the average value of 60% with a sufficient category. So we can conclude that the percentage of the average value of the highest problem solving ability of students on the indicator of understanding the problem is 99% and the percentage of the average value of the lowest student's problem solving ability on the indicator of checking again with a percentage value of 60%.

The high ability of students in the aspect of understanding the problem is because students have good abilities in reading / literacy questions. This can be seen

when learning takes place during observing activities, students are given contextual problems / story questions. Students are asked to identify what is known and what is being asked in the problem. In addition, from the results of the posttest, students' answers were more correct in understanding the problems in the questions.

The results of this study support the results of previous studies, such as studies using aapproach *scientific*, including the research of Erny, Haji, Widada (2017) which states that there is an influence of the scientific approach in learning mathematics on problem solving abilities and higher order thinking skills. The research of Trihasari, Haji and Nirwana (2019) stated that there was a linear effect of the covariate of initial problem-solving abilities on the final problem-solving abilities of students who were taught using the Problem Based Learning model with aApproach *Scientific*. Putri and Haji's research (2019) which states that there is an effect of applying the scientific approach assisted by power point media on the ability of mathematical deposition. Further research Marika, Haji, Herawaty (2019), whose results indicate that differences significant between students who are taught by teaching scientific approach using GeoGebra Softwere with conventional learning.

The aspect of re-examining in this study is the aspect with the lowest category among other aspects. The low aspect of checking back on students' problem-solving abilities is because students are less accustomed to double-checking whether their answers are right or wrong. Usually after solving the problem and making conclusions, the questions are considered complete without checking whether their calculations are correct or incorrect, as shown in the following student work results:



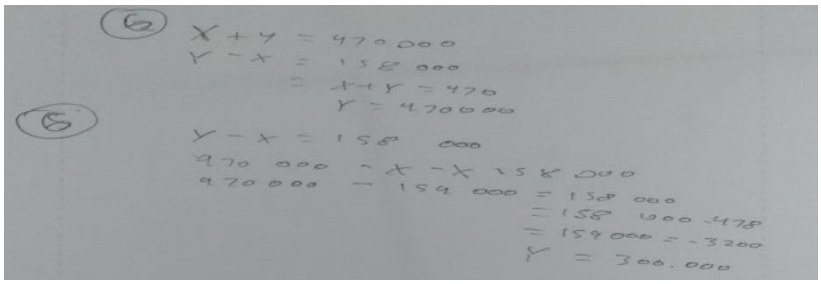


Figure 2. Student Work Results who get low scores

It can be seen from Figure 2 that students do not work optimally. Even for re-checking indicator questions, students have difficulty. In this case, the students reasoned that they did not understand how to re-check the correct or incorrect answers. And the other questions, such as questions no. 4 and 5, which are indicators of carrying out the plan (solving problems) are carried out only modestly and incompletely. In this case the students reasoned because the time given to work on the questions was not enough. While other students can finish of test well. For example, students can work on questions well as follows:

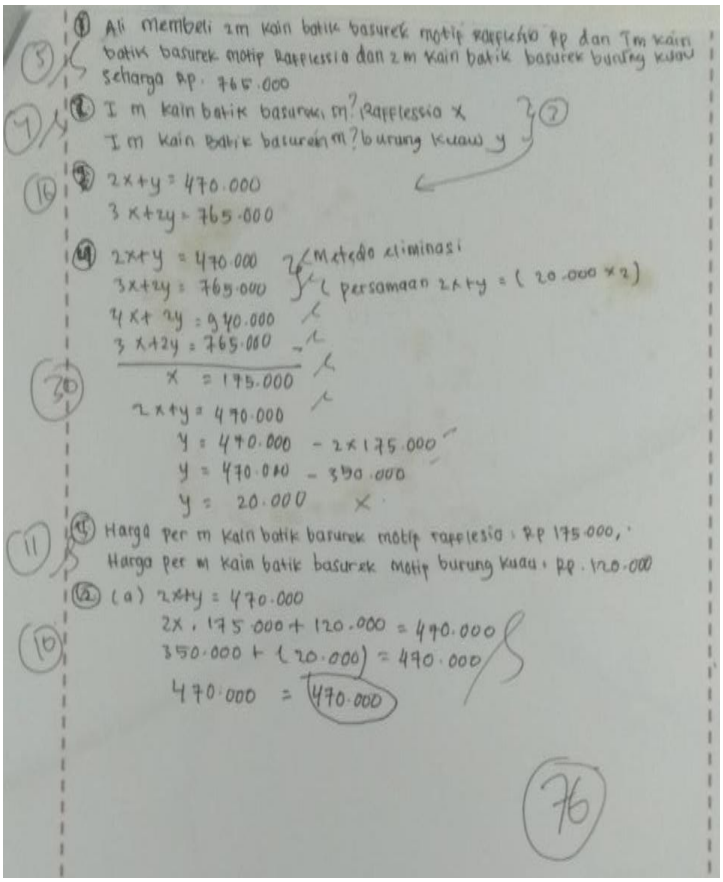


Figure 3. Student Work Results who get moderate scores

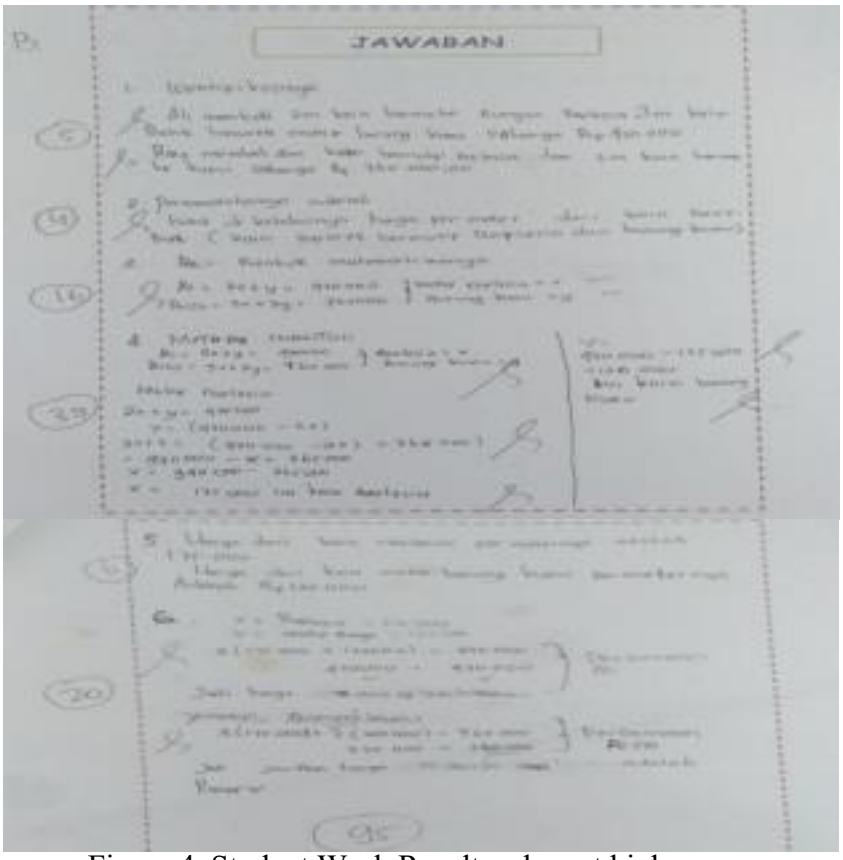


Figure 4. Student Work Results who get high scores

From the results above it can be seen that students can work on questions well. Although there are still some students who have not been able to complete questions perfectly. Individually students are more responsible in developing their problem solving abilities. The increase in the average score of students is also due to the understanding and mastery of students' problem-solving skills regarding the material has begun to increase.

Hypothesis Testing Data on Students' Problem-Solving Ability

Data on increasing students' problem-solving abilities were used to determine students' problem-solving abilities after being given treatment. The average value of students' problem solving abilities can be seen in table 5 below.

Table 5. Average Value of Pretest, Posttest, Gain, and N-gain Problem Solving Ability

Class	N	Average				Category
		Pretest	Posttest	Gain	N-Gain	
KPM	20	27.85	76.50	48.65	0.67	Medium

The results of pretest data analysis of solving ability students' problems in solving story problems on the SPLDV material, it was found that the average value of the pretest was 27.85. The low average value of the pretest is because students are still not taught material about SPLDV in more depth. After the learning was carried out, the students were given the same problem-solving ability posttest. The results of data analysis showed the average value of the posttest was 76.50. Then the gain value is 48.65 and the N-gain value is 0.67. The achievement of students' problem solving abilities in this study was quite maximal with an N-gain of 0.67 in the medium category. This is because there are some students who experience technical problems when learning through theapplication *Zoom*. The results of the analysis between the pretest and posttest that were tested on the student's problem-solving ability test turned out to have significant differences or there were significant differences. This shows the success of increasing students ' problem - solving skills in learning using aapproach *scientific* throughmedia *zoom*.

There are several things that support the success of theapproach *scientific* in improving problem solving skills, namely theapproach *scientific* throughmedia *zoom* is an approach that actively involves students from the beginning of learning to the end of learning. So that learning is considered more meaningful.

From the results of the N-Gain Test using the IBM SPSS 23 program, the data obtained from the hypothesis test results of the value of students' problem solving abilities in solving story problems can be seen in table 6 below.

Table 6. Hypothesis Test Results Data Problem Solving Ability

Tabel 6. Descriptives

	Class			Statistic	Std. Error
NGain Persen	Eksperimen	Mean		**67.3779**	4.86365
		95% Confidence Interval for Mean	Lower Bound	57.1982	
			Upper Bound	77.5577	
		5% Trimmed Mean		68.9729	
		Median		71.2113	
		Variance		473.102	
		Std. Deviation		21.75090	
		Minimum		**14.67**	
		Maximum		**91.38**	
		Range		76.71	
		Interquartile Range		29.98	
		Skewness		-.881	.512
		Kurtosis		.142	.992

Based on results of test calculations N-gain score above, indicates that the value - average N-gain for the application ofapproach *the scientific* through the medium of *the zoom* is 67 .3779 or 67.4% included in the medium category. With a minimum N-gain score of 14.67% and a maximum of 91.38%.

Thus, it can be concluded that the application of aapproach *scientific* throughmedia is *zoom* effective in improving students' problem solving abilities in solving story problems for class VIII.E students of SMPN 11 Bengkulu City in the first semester of the 2020/2021 school year.

4. Conclusion and Suggestions

The average value of students' problem-solving abilities using aapproach *scientific* throughmedia is *zoom* 76.50 and N-gain is 0.67 in the medium category. Hypothesis analysis shows that there is a significant difference in students' problem-solving abilities in solving story problems before and after the application of theapproach *scientific* throughmedia *zoom* with a value of 67.4%.

Based on the results of this study, the Scientific Approach with Zoom Media can be used as an alternative learning approach that can be used during the COVID-19 pandemic, especially in improving problem solving skills about story problems.

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