

Worksheet Development with The Problem Solving Methods at Grade IV of Elementary School Students

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Abstract-The research background starts from the number of teachers who have not done the worksheet development. The purpose of this research was to describe the worthiness of worksheet with the problem-solving method to improve critical thinking and problem-solving skills of fourth-grade elementary school students. This study is research and development design that produce the new product in the form of the worksheet with the problem-solving method. The research design applied was Nonequivalent Control Grub Design, using the observation sheet instrument, the test sheet, questionnaire and validation sheet as the data collection tool. The results showed that the worksheet with the problem-solving method was useful in learning. Worksheet with the problem-solving method can be used to train and improve critical thinking and the problem-solving skills of fourth-grade student elementary school.

Keywords - Worksheet, Critical, the problem-solving

I. INTRODUCTION

Student worksheets are sheets that contain tasks that must be done by students [1]. Basically, worksheet serves to facilitate student's understanding in learning material by minimizing the role of teachers. Moreover, it makes the student more active in its use whereas teacher is responsible for monitoring student's activities during the learning process (Prastowo, 2012: 205) [5]. The need of the worksheet is very important to be given to the students since by delivering the worksheet on the learners; the teacher will know how to support in improving the ability of the student through the worksheet. Thus, it is necessary to make an ideal worksheet according to the standard specified in Government Regulation no. 19 Year 2005 Article 43 Point 5 about the national standard of education that contains the feasibility of content, language feasibility, graphic feasibility, and presentation feasibility [4]. Contrary with the point of Government Regulation no 19 year 2005 article 43 points 5, the currently used worksheet is still far from the standard which referred to the government regulation. The contents of currently used worksheet is still in the form of multiple choice questions and descriptions that refer only to textbook curriculum 2013 without regarding to the achievement of indicators of critical thinking and problem-solving skills.

Researcher's observations result on December 20th, 2017, to the teachers of Hang Tuah 6 Surabaya elementary school, showed that the worksheet used is a worksheet purchased from one publisher. The worksheet was used as a subscription by the school from year to year. It is in line with the opinion of Prastowo who stated that the ordinary worksheets abbreviated as LKS is generally purchased and is not made by the teachers themselves. As the worksheet purchased instantly, of course, the contents will not appropriate to critical thinking skills' indicators and the problem-solving [6].

The researcher's observations also found the reason why teachers prefer to use the worksheet by purchasing, the reasons are as follows: 1) teachers consider that the purchased worksheet is more practical, 2) the lack of knowledge of teacher in making the worksheet 3) the teacher is preoccupied with the additional task such as serving as operators, treasurers, and extra-curricular executives, 4) teachers are busy with the curriculum administration of 2013 especially on value analysis, correction of duties and daily tests, 5) there is no specific budget for creating worksheets independently and 6) there is no training program for making worksheets from schools and related foundations.

As times goes by, the problems faced by the students will be more complex in the future. In fact, every day they must face such problem, both personal problems and group problems (Santrok, 2010: 210) [7]. In order to survive in the modern competition era, the students are required to think critically and are required to solve the problems faced in real life, where critical thinking is employed to respond to existing problems, so students will able to solve the problem. Lai in Putri et al (2016: 540) also revealed that teachers should often teach critical thinking skills to students in the learning process and provide real examples to illustrate abstract concepts so that students are ready and prepared when faced with issues related to daily life [3].

After reviewing the above opinion, it can be concluded that it is importance to inculcate critical thinking skills and the problem-solving from an early age. In this case, the teacher can develop worksheet with the problem-solving method that can be adapted to the needs, situation, and

condition of learning, so as to train students to develop critical thinking skills and the problem-solving that they have.

Efforts to integrate worksheets with the problem-solving methods aim to train students in developing critical thinking and problem-solving skills. This is in accordance with the opinion of John Dewey in Santrok (2014: 56) that children should not be educated in academic topics but should be taught to think and become problem solvers [8]. The problem-solving method is very suitable to be combined with the worksheet, because the problem-solving method contains activity that can train and maximize critical thinking skill and the problem-solving of the fourth-grade student in the elementary school. This opinion is in line with Hamruni's opinion (2012: 104) [2] where Problem Solving method is developed to assist students in developing thinking ability, problem-solving, and intellectual skills.

The worksheet that was created by the researcher is combined with the contents of the problem-solving method, so when it has combined, the contents of the Worksheet will have the following content: 1) formulate the problem, 2) analyze the problem, 3) formulate the alternative, 4) implement the strategy of choice, and 5) evaluation (Sanjaya, 2006: 217). After inserting the problem-solving method content in the Worksheet, it will be a learning resource in the form of Worksheet with the problem-solving method. Worksheet with the problem-solving method will be carried out in learning with the concept of the problem-solving learning. The reason why researchers use the problem solving learning in the implementation of the worksheet with the problem-solving method was to give a meaningful impression on the student since it is now the era of learning centered on learners.

II. METHOD

This research was a research and development (R &D) type. Brog and Gall in Sugiyono (2014: 28) state that R & D (Research and Development) is a process or method used to validate and develop such product [9].

Research subjects in this study were the fourth graders of SD Hang Tuah 6 Surabaya consisting of 50 students with two classes. The location of this research was on SD Hang Tuah 6 Surabaya located at Jalan Memet S No. 5 Komplek AL Kenjeran, Bulak District of Surabaya City.

The model used in developing worksheet with the problem-solving method was the 4-D models of Thiagarajan, et al (197: 45) [10], where in this 4-D model, there are four stages of development, namely: 1. Define, 2. Design, 3. Development and 4. Disseminate.

This research used the design of Nonequivalent Control Grub Design for the experiment. The design of this research contained two selected groups, then deliver a pretest to determine the initial state, whether any differences between the experimental group and the control group. The pretest results are good when the experimental group scores did not

differ significantly. Here is the design chart of Nonequivalent Control Grub Design:

Chart 1

<i>Nonequivalent control grub desain</i>			
Treatment group	O1	X	O2
Control group	O3	-	O4

The instruments used in this research were as follows: 1. Observation sheet, 2. Test sheet, 3. the questionnaire, and 4. Validation sheet. Observation sheets were used to measure teacher's implementation in learning. The test sheets were used to measure the success of mastering critical thinking skills and the problem-solving of students. The questionnaire was used to measure students' responses to the course of learning and validation sheets were used to measure the validity of the worksheet with problem solving problems. For the analysis of data processing, this study used quantitative analysis techniques with statistical formulas and descriptive qualitative analysis.

III. RESULTS AND DISCUSSION

The research results will be described into three parts, namely: 1) the validity of the worksheet with the problem-solving method, 2) the practicality of the worksheet with the problem-solving method and 3) the effectiveness of the worksheet with the problem-solving method.

The validity of the worksheet with the problem-solving can be seen from the expert's assessment of the quality of the worksheet with the problem-solving method; the expert's judgment can be seen in the table below:

TABLE I. WORKSHEET VALIDATION WITH PROBLEM SOLVING METHOD

No	Experts	Score	Percentage	Category
1	Expert 1	121	91%	Can be used with little revision
2	Expert 2	110	83%	Can be used with little revision

From the data table validation worksheet with the problem-solving method above, it can be concluded that the worksheet with the problem-solving was very feasible to apply because the results of the assessment experts showed that the worksheet with the problem-solving can be used with a little revision.

The next result was the practicality of the worksheet with the problem-solving method. The practicality of the worksheet with the problem-solving method can be seen from two assessments, namely: the observer's evaluation of the learning process using the worksheet with problem solving method and the students' assessment result on the use of worksheet with problem solving method during learning.

TABLE II. OBSERVER ASSESSMENT TO THE LEARNING

Meeting to	Score	Percentage	Category
1	41	84%	Very High
2	44	92%	Very High
3	44	91%	Very High
4	41	84%	Very High
5	43	90%	Very High
6	44	92%	Very High
Mean	43	89%	Very High

From the table above, it can be seen that the results showed the average score of 38 with 89% percentage, indicating that the practicality of the worksheet with the problem-solving method obtained is very good predicate to be applied in learning. In addition to assess the practicality of the worksheet with the problem-solving method, it can also be known from the questionnaire of student response after learning to use the worksheet with the problem solving method. The following is the student response data:

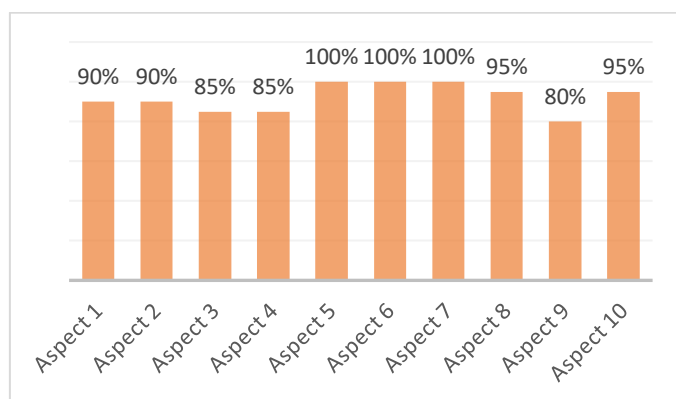


Diagram 1 student's respond

From the diagram above it can be seen that: 1) 90% of student can understand the material in the worksheet with the problem-solving; (2) 90% of students can understand the images in the worksheet with the problem-solving method; (3) 85% of students understand the problems in the worksheet with the problem-solving method; (4) 85% of students can understand the questions in the worksheet with the problem-solving method; (5) 100% students can understand every sentence in the worksheet with the problem-solving; (6) 100% students prefer color and image design on worksheets with the problem-solving problems; (7) 100% students like the front cover design of the worksheet with the problem-solving; (8) 95% of students like to work problems in the worksheet with the problem solving method; (9) 80% of students like crafting the problem-solving strategies on the worksheet with the problem-solving problems and (10) 95% of students are

happy to follow the lesson with the worksheet with the problem-solving problem.

After describing the observer's assessment on the way of learning and student's responses to learning using the worksheet with problem solving method, it can be concluded that the worksheet with problem solving decode was practically used in learning because it obtains a very good predicate.

The effectiveness of using worksheet with problem solving method to improve critical thinking and problem solving skill can be seen from the result of student learning result test. The pretest and posttest results will be tested by t-test to determine the effectiveness of the worksheet with problem solving problems on improving critical thinking and problem-solving skills. Before the t-test was done, the test performs a normality test and homogeneity test to determine whether the data has normally distributed or not. Here is the normality test which was done using the chi-square formula:

TABLE III. NORMALITY TEST

Normality Test	Sig	α	Category
Experiment class			
Pretest Critical Thinking	0,40	0,05	Normal
Posttest Critical Thinking	0,15	0,05	Normal
Pretest problem solving	0,57	0,05	Normal
Posttest problem solving	0,22	0,05	Normal
Control class			
Pretest Critical Thinking	0,21	0,05	Normal
Posttest Critical Thinking	0,15	0,05	Normal
Pretest problem solving	0,11	0,05	Normal
Posttest problem solving	0,15	0,05	Normal

After the normality test was done, then the next step is to test the homogeneity in order to know whether the two classes are homogeneous or not. The sample is homogenized if the score is $\text{Sig} < \alpha$, with F_t is 0.05. The following was the pretest and posttest homogeneity test results:

Table IV: Homogeneity Test

Homogeneity Test	Sig	α	Category
Pretest Critical Thinking	0,201	0,05	Homogenous
Posttest Critical Thinking	0,082	0,05	Homogenous
Pretest problem solving	0,179	0,05	Homogenous
Posttest problem solving	0,546	0,05	Homogenous

Based on the table above, it can be concluded that the experimental class and control class was homogeneous.

After knowing that the data distributed in both classes are normal and homogeneous, the next step was to do a t-test with the criteria of H_0 is accepted if $Sig < \alpha$ table. Here are the pretest and posttest test results:

TABLE V. T-TEST

T-Test	Sig (2-tailed)	α	Test decision
Critical Thinking	0,000	0,05	H_0 rejected
problem-solving	0,000	0,05	H_0 rejected

The data in the table V shows the calculation of t-test using the t-test, it can be seen that the data of hypothesis test results of critical thinking skills of the control group and experimental group shows $Sig (2\text{-tailed}) \geq \alpha$ was $0.000 \geq 0.005$, so the test decision is that H_0 is rejected and H_a is accepted. The result of hypothesis test result data of the problem-solving skill between the control group and experiment group also shows that $Sig (2\text{-tailed}) \geq \alpha$ was $0.000 \geq 0.005$, so the decision of test is that H_0 is rejected and H_a is accepted. Based on the data calculated using the t-test, it can be concluded that the worksheet with the problem-solving method was effective for improving critical thinking and the problem-solving skills as proved by the significant difference between motivation and students' learning result in the experimental class and control class.

IV. CONCLUSION

Based on the results of the research and discussion above, it can be concluded that: (1) The worksheet with the problem-solving method is very useful because the expert's assessment indicates that the worksheet with the problem-solving can be used with little revision; (2) Worksheet with the problem-solving method otherwise was practically used in learning because it obtains excellent predicate from observer or student's response to use worksheet with the problem-solving method during learning; (3) Worksheet with the problem-solving method proved to be effective to improve students' critical thinking skills. The results of this study indicate that there is a significant difference between students' critical thinking skills in the experimental class and control class. This is proved from the results of t-test which shows that the value of $Sig (2\text{-tailed}) \geq \alpha$ is $0.000 > 0.005$, so the H_0 test decision was rejected and H_a is accepted; (4) Worksheet with the problem-solving method proved to be effective to improve students' problem-solving skills. The results of this study indicate that there was a significant difference between students' the problem-solving skills in the experimental class and control class. This is proved from the results of the t-test that shows that the value of $Sig (2\text{-tailed}) \geq \alpha$ is $0.000 > 0.005$, so the decision of H_0 test was rejected while H_a is accepted.

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