Development of Student Worksheets Based Discovery Learning Model in Improving Student Learning Outcomes of Fourth Grade State Elementary School Students

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Abstract:
The problem in this study is that there are still many fourth grade students of the Margajaya Elementary School whose learning outcomes are below the minimum completeness criteria. This study aims to develop worksheets based on the appropriate Discovery Learning Model, to analyze the effectiveness and attractiveness of the worksheets, to find out the differences in learning outcomes of students who use Discovery Learning Model-based worksheets and those that do not. Research and development (R&D) refers to the theory of Borg and Gall. The study population was all fourth grade students of elementary school, Metro Kibang sub-district and the sample was determined by the multi-stage random sampling technique, they are fourth grade A students of one margajaya elementary school and fourth grade A of two kibang elementary schools. The instrument used was a test to measure learning outcomes and a questionnaire to measure the response to effectiveness and attractiveness of worksheets. The results showed that the worksheets developed were suitable for use in learning, were effective for learning and were attractive to students, and there were differences in learning outcomes of students who used Discovery Learning Model-based worksheets with students who didn't use worksheets.
Key Word: worksheet, Discovery Learning Model, learning outcomes

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I.   Introduction

Education is important and the key to the success of a nation. Education is also a benchmark for a nation to be able to compete in the international world. Education can create a nation that is strong, independent, has character, and is competitive. Advances in science and technology are increasingly rapid and increasingly demand quality Human Resources (HR), to improve HR, of course, the quality of education must be improved. Education in elementary school is intended as an effort to provide students with basic abilities in the form of knowledge, skills, and attitudes that are beneficial to them according to their level of development, as well as to prepare them to continue to a higher level. Learning is designed no longer teacher centered (teacher centered) but student centered (student centered).

The 2013 curriculum, hereinafter referred to as K 13, aims to prepare Indonesian people to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and affective and able to contribute to the life of society, nation, state and world civilization. The implementation of learning at Elementary Schools / Madrasahs is carried out with an integrated thematic learning approach. Thematic-integrated learning is the content of learning in Elementary School / Madrasah Ibtidaiyah subjects organized into themes (Permendikbud No 57, 2014: 2-5). K 13 uses an integrated thematic learning approach and a scientific approach. The learning process consists of five main learning experiences, namely: observing, asking questions, gathering information, associating, and communicating (Permendikbud No 81 A, 2013: 7) To strengthen the scientific approach (scientific), integrated thematic (thematic between subjects), and thematic (in a subject) it is necessary to apply disclosure-based learning (discovery / inquiry learning). To encourage the ability of students to produce contextual work, both individually and in groups, it is highly recommended to use a learning approach that produces problem solving-based work (project based learning) (Permendikbud No 22, 2016: 3).

In the implementation of K 13, the government has prepared text books for students equipped with teacher books. The material in the available books is minimal, if in use it requires development, the teacher can add it according to the needs and characteristics of schools and regions. One of the teaching materials that can be used as a supporting book besides the use of textbooks for students is the Student Worksheet (LKPD). LKPD is a sheet that contains tasks that must be done by students. LKPD is usually in the form of instructions, steps to complete a task, a task that is instructed in the activity sheet, the basic competencies that will be achieved must be clear (Depdiknas, 2005: 18).

Observations made by researchers in class IV Elementary School One Margajaya on August 28, 2017 and grade IV Elementary School Two Kibang on August 29, 2017, found that learning was still classical in nature, still dominated by the use of the lecture method in the classroom, students were less involved in problem solving activities, the teaching materials used are still sourced from one textbook, the teacher does not develop the use of teaching materials in the form of LKPD in learning. The learning carried out by the teacher in the classroom is actually good, but the learning outcomes achieved by students are still low. Based on these results, some of the reasons, among others, are that the teacher has not been maximal in applying various learning models and the use of teaching materials is still limited by using textbooks, activity tends to be dominated by teachers, student activity in learning activities is still low, it can be seen that when learning takes place students are only stuck On listening to explanations from the teacher then working on assignments given by the teacher both individually and in groups, students are still dependent on the teacher in completing assignments, students have not been fully trusted in finding alternative answers, and teachers do not relate learning material to the real world of students.

Seeing this condition, the researchers considered it necessary to develop teaching materials by applying a learning model that involved students actively in learning activities. Based on this, the researcher will develop LKPD on the theme of 9 Riches of My Country, Sub-Theme 3, Preservation of Natural Resources in Indonesia based the Discovery Learning model to improve learning outcomes for fourth grade students of elementary school in metro kibang sub-district. Discovery is a learning model developed based on the view of constructivism. This model emphasizes the importance of understanding important structures or ideas in a scientific discipline, through active student involvement in the learning process.

Wilcox (in Hosnan, 2014: 281) states that in learning with discovery, students are encouraged to learn mostly through their own active involvement with concepts and principles, and teachers encourage students to have experiences and conduct experiments that allow them to discover principles for themselves. Kaptan & Korkmaz (in Balim, 2009: 3) Discovery Learning is a method that encourages students to arrive at a conclusion based on their own activities and observations. Discovery learning is a learning model that demands student activeness in learning, guiding students to conduct research and find solutions to problems independently. Thus students will have a broad learning experience because students are directly involved in the process of investigation and problem solving.

Meanwhile, in addition to applying the learning model, learning objectives will also be achieved, one of which is the existence of various teaching materials. Books can be excellent teaching materials for students. However, other teaching materials are needed to support learning activities in class. So that students are not only fixated on the material in the book. LKPD can be an alternative teaching material for teachers besides books. Sasmaz-Oren & Ormanci (in Che-Di Lee, 2014: 95) Teachers use worksheets for learning support purposes, promote active learning, increase interest in studying science, and assessment. Many studies have shown that well-designed worksheets have a positive impact on student achievement. Furthermore, Yiğitu & Akdeniz (in Ozmen & Yildrim, 2005: 10) worksheets are learning materials that make students more active and all students participate in the learning process.

Chappell and Craft and Susantini et al. (in Utami, et al, 2016: 16) which states that student worksheets are part of teaching materials that can be used to develop thinking skills, ask and answer questions, make connections and assess student learning outcomes improvement. Tomlinson (in Utami, et al, 2016: 17) states that teaching materials and worksheets that can develop student learning experiences are tools that: informative (informing learning objectives), there are learning strategies (for face-to-face learning and practice), formulate learning experiences clear, motivational, exploration to help students make new discoveries in their studies. Furthermore, Richard and Tomlinson (in Utami, et al, 2016) stated that ideal teaching materials and worksheets are devices that can provide information and learning experiences and are well developed with designs and features.

The development of LKPD aims to make students more active and more independent in learning activities. According to Prastowo (2011: 205-207) the purposes of using LKPD are:
1. Presenting teaching materials that make it easier for students to interact with the material given;
2. Presenting tasks that increase the mastery of learners of the material given;
3. Train students' learning independence; and make it easier for educators to assign assignments to students.

Tomlinson (in Wiwik, et al, 2006: 316) states that teaching materials and worksheets that can develop learners' learning experiences are devices that: informative (informing learning objectives), there are learning strategies (for face-to-face learning and practice), formulate experiences clear learning, motivation, exploration to help learners make new discoveries in studies. It is further stated that the ideal study materials and worksheets are devices that can provide information and learning experiences and are developed with good designs and features.

The purpose of this research is to realize the development of teaching materials in the form of LKPD with discovery learning models so that it can improve the learning outcomes of fourth grade students of elementary school in metro kibang sub-district.

II. Methods

The type of research that will be used is development research, in which the research and development design is based on the adaptation of the development model steps from Borg & Gall. Development research steps that can be used for research in the field of education as suggested by Borg & Gall (1983: 784) are as follows: 1) gathering research information 2) planning 3) developing initial product formats 4) initial trials 5) product revision 6) field trial 1 7) product revision 8) field trial 2 9) product revision 10) dissemination and implementation. The population in this study were all fourth grade students in elementary school in metro kibang sub-district.. In this study, the sampling technique used was the multi stage random sampling technique. The selected samples were students of class IV A at elementary school one margajaya and Class IV A at elementary school two kibang.

Data collection techniques in this study used test and non-test techniques. The test technique is used to find data about student learning outcomes, while non-test techniques are documentation to obtain data on the number of students and the test scores of the odd semester students at the time of the preliminary research. The non-test technique in the form of a questionnaire was used to obtain data about the attractiveness of the LKPD, the effectiveness of the LKPD, and the development of the LKPD

The instruments used in this study were test instruments and questionnaire instruments for material experts, media experts and linguists. The test given is an objective test in the form of multiple choices, amounting to 20 item questions with 4 answer choices. The LKPD validity sheet is used to measure the validity of the LKPD that will be carried out by the validator. As for the validators, namely postgraduate lecturers. The effectiveness and attractiveness of the LKPD instrument is used to determine the effectiveness and attractiveness of the LKPD. The instruments used in this study were in the form of tests and non-tests. In compiling and carrying out tests, so that the instrument becomes a good measuring tool, steps are taken to make a test question grid, compile test questions according to the grid that has been made, carry out expert validation of the instruments made, revise product results, test questions. Validate the items using the product moment formula with rough numbers, namely:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Information:

N $\quad$ = Correlation coefficient between item scores and total score
X $\quad$ = Item score
Y $\quad$ = total score

r_{xy} $\quad$ = Correlation coefficient between variable X and variable Y

Table 1. List of Interpretation "r" Coefficient

"r" Coefficient	Reliabilty
0,80 – 1,00	Extremely Strong
0,60 – 0,79	Strong
0,40 – 0,59	Medium
0,20 – 0,39	Weak
0,00 – 0,19	Extremely weak

Source: Sugiyono (2009: 257).

The level of reliability is empirically indicated by a number called the reliability coefficient value. High reliability is indicated by a value close to number 1. Reliability is considered satisfactory if ≥ 0.60. To test the difficulty level of the questions in this study, we will use the Microsoft Office Excel program. The formula used to calculate the level of difficulty, namely:

$$P = \frac{B}{JS}$$

Information:
P $\quad$: level of difficulty
B $\quad$: the number of students who answered correct question
JS $\quad$: The total number of students taking the test
Source: Arikunto (2007: 208)

In this study, to determine the level of difficulty using the Microsoft Office Excel program.

Table 2. Classification of Problem Level of Difficulty

No.	Difficulty Index	Difficulty Level
1	0,00 – 0,30	Hard
2	0,31 – 0,70	Medium
3	0,71 – 1,00	Easy

Source: Arikunto, (2007: 210)

The technique used to calculate the power of discrimination is to subtract the average of the upper group who answered correctly and the average of the lower group who answered correctly. The formula used to calculate the distinguishing power is:

$$D = \frac{BA}{JA} - \frac{BB}{JB}$$

Information:

D = Discrimination index
J = Number of students
JA = Number of students the top group
JB = Number of students the bottom group
BA = Number of students the top group who answered correctly
BB = Number of students the bottom group who answered correctly

(Source: Arikunto, 2013:59)

Table 3. Criteria for Discriminatory Power Index

Discernment	Interpretation
0,00 – 0,20	Less
0,21 – 0,40	Enough
0,41 – 0,70	Good
0,71 – 1,00	Very Good

(Source: Arikunto, 2013: 59)

The data analysis technique used the normality and homogeneity test. There are two data that need to be tested for normality, namely the *posttest* data for the experimental class and the control class. The normality test uses the *chi square formula* and the *Microsoft Excel* program. The interpretation of the calculation results is done by comparing the calculated x^2 and x^2 table for $\alpha = 0.05$ with dk = k - 1. The homogeneity test is calculated using the F-test with the *Microsoft Excel* program. The decision rule if $F_{count} < F_{table}$ then the variance is homogeneous. The level of significance set was 0.05.

The hypothesis in this study is the realization of the development of LKPD with the theme of My Country's Wealth. The sub-theme for the preservation of natural resource wealth in Indonesia with the *Discovery Learning* model for class IV elementary school. And there are differences in the learning outcomes of students who use the LKPD with the *Discovery Learning* model and those who don't use the LKPD with the *Discovery Learning* model. Testing the first hypothesis with the product development of LKPD with the theme of My Country's Wealth with the sub-theme of the Preservation of Natural Resources in Indonesia with the *Discovery Learning* model for class IV elementary school, the second hypothesis testing with the *n-gain* formula to test its effectiveness. As stated by Hake (Sundayana, 2015: 151) that by getting a normalized average gain value, it will roughly measure the effectiveness of learning in conceptual understanding. The formula can be written as follows:

$$g = \frac{Spost - Spre}{Smax - Spre}$$

Information:

g = *N-Gain*
Spost = *Posttest* Score
Spre = *Pretest* Score
Smax = Maximum Score

From the results of the N-Gain calculation above, then it can be categorized as high, medium, and low values.

Table 4. Normalized Gain Categories

Perecentage	Interpretation
$-1{,}00 \le g \le 0{,}00$	Decline
$g = 0{,}00$	Steady
$0{,}00 < g < 0{,}30$	Low
$0{,}30 \le g < 0{,}70$	Medium
$0{,}70 \le g \le 1{,}00$	High

(Source: Sundayana, 2015: 151)

To test the attractiveness of researchers using a questionnaire. The analysis of the attractiveness questionnaire has 4 answer choices. The questionnaire attractiveness data has 4 answer choices according to the question content, namely: "not interesting", "quite interesting", "interesting", and "very interesting".

Table 5. Criteria for the Assessment of Attractiveness & Conversion of Score into an Assessment Statement

Answer Options Attractiveness Test	Rating Score	Average Score	Classification
Very attractive	4	$3{,}26 - 4{,}00$	Very Good
Attractive	3	$2{,}51 - 3{,}25$	Good
Less attractive	2	$1{,}76 - 2{,}50$	Less Good
Not Attractive	1	$1{,}01 - 1{,}75$	Not Good

(Source : Suyanto & Sartinem, 2009: 227)

The instrument used has 4 answer choices, so that the total assessment score can be found using a formula.

Assessment score = Total Score x 4
                   Total Value Total Score Highest

The results of the assessment score are then sought for the average of a number of trial samples and converted to an assessment statement to determine the level of attractiveness of the product developed according to the respondent.

The third hypothesis is tested by testing criteria, if t count <t table, then Ha is rejected, but vice versa if tcount> t table or t count = t table then Ha is accepted. To find out which variable X affects variable Y, which means that the effect that occurs can apply to the population (can be generalized), namely using the t test formula. The t test used is the Independent Sample T Test is used to compare the means of the two groups that are not related to one another. The two groups sampled from this study, namely the experimental group and the control group, will be compared with their average posttest scores. The formula for the t test is as follows:

$$ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} $$

Keterangan:
$\bar{X}_1$: Nilai rata- rata data pada sampel 1
$\bar{X}_2$: Nilai rata- rata data pada sampel 2
S_1^2 : Standar deviasi sampel 1
S_2^2 : Standar deviasi sampel 2
n_1 : Jumlah anggota sampel 1
n_2 : Jumlah anggota sampel 2
Sumber: Sugiyono (2016: 273)

The product success criteria developed if the average student learning outcomes of the experimental class were greater than the control class, then Ha was accepted, conversely if the average learning outcomes of the experimental class were lower than the control class, then Ha was rejected.

III. Results

Initial Gathering Information

The initial stage of the research was carried out by collecting data in the form of information on the learning process of elementary school one margajaya. This is used as material for consideration and the basic principle in developing LKPD based on obtaining empirical data about how the profile and subject under study. Based on the results of preliminary research conducted in the form of interviews and needs questionnaires carried out on the principal and

class IV educators and students at elementary school margajaya, Metro Kibang District, the following preliminary data were obtained.

1. Elementary school one margajaya has been using the 2013 curriculum since the 2013 curriculum was first implemented.
2. The teaching materials used are in accordance with the 2013 curriculum, but educators only use books purchased from publishers as the only source of learning material.
3. Learning that takes place is not student-oriented.
4. Learning activities are dominated by teachers.
5. Teachers have not been maximal in applying various learning models.
6. Student activities in learning activities tend to be less active, it can be seen that when learning takes place students are only fixated on listening to the explanation from the teacher then doing the assignments given by the teacher both individually and in groups, students still depend on the teacher in completing the assignment.
7. Students have not been fully trusted in conducting their own investigations.
8. Students have not fully studied independently, they still depend on the teacher.

Based on the results of the preliminary research, it is necessary to develop LKPD based on the discovery learning model used by students at elementary school one margajaya so that the development of this LKPD can improve student learning outcomes.

Planning
The results of the planning stage carried out by the researcher are as follows: Preparation of the LKPD framework, determining systematics, planning evaluation tools, and preparing assessment instruments

LKPD development
The development of the initial product format was carried out in accordance with the draft LKPD framework.

Initial Trial
Initial product trials were carried out in three parts, namely material validation, media validation, and language validation. Material validation was tested by Dr. Darsono, M. Pd, media validation was tested by Mr. Alben Ambarita, M. Pd, and language validation was tested by Mr. Mulyanto Widodo, M. Pd. The results of the validation for each section will be described as follows.

Table 6. Scores for Material Expert Validation Assessment

Results of Material Expert Validation	Phase 1	Phase 2
Total Score	94	112
Maximum Score	124	124
Secore	75,81	90,32
Category	Good	Very Good

Table 7. Media Expert Validation Assessment Score

Results of Media Expert Validation	Phase 1	Phase 2
Total Score	89	101
Maximum Score	104	104
Secore	85,58	97,12
Category	Good	Very Good

Table 8. Linguist Validation Assessment Scores

Results of Linguist Expert Validation	Phase 1	Phase 2
Total Score	41	48
Maximum Score	52	52
Secore	78,85	92,3
Category	Good	Very Good

Product Revisions
Product revisions are carried out after validating the product. Product validation was carried out by three experts, namely media experts and material experts.

Field Trial 1
Field trial 1 was conducted to assess the effectiveness and attractiveness of the developed LKPD. This stage is carried out to find out how effective and attractive the use of LKPD is with the discovery learning model. The theme of Riches of

My Country, Sub-theme of the Preservation of Natural Resources Wealth in Indonesia. At this stage, a questionnaire on the effectiveness and attractiveness of the LKPD was given to 3 class IV teachers at State Elementary School who are members of the North Cluster teacher working group and 3 grade IV teachers at elementary school who are members of the south cluster teacher working group with a total of 6 people.

The results of the effectiveness test can be explained in the aspect of effectiveness, there are 2 respondents (33.33%) who think it is very effective and 4 respondents (66.67%) think it is very effective with an average score of 3.19 in the Effective category. This shows that LKPD with discovery learning models is effective for improving student learning outcomes. The results of the attractiveness test can be explained in the aspect of attractiveness, there is 1 respondent (16.67%) who thinks that LKPD is very interesting and 5 respondents (83.33%) think it is interesting, with an average score of 3.17 in the attractive category. This shows that the appearance of LKPD based on discovery learning models according to respondents makes students interested in using LKPD and wants to keep repeating and practicing using LKPD based on discovery learning models.

Product Revisions

Based on the results of the LKPD trial based on the discovery learning model, it was found that the LKPD based on the discovery learning model was effective and interesting to use in learning. However, there need to be several parts of the LKPD that need to be revised. So it can be concluded that the LKPD based on the discovery learning model was revised before being tested in field test 2.

Field Trial 2

Field trial 2 was conducted to assess the effectiveness and attractiveness of the developed LKPD. This stage is carried out to find out how effective and attractive the use of LKPD is with the discovery learning model. The theme of Riches of My Country, Sub-theme of the Preservation of Natural Resources Wealth in Indonesia. At this stage, a questionnaire on the effectiveness and attractiveness of the LKPD was given to 4 class IV teachers in SD Negeri who are members of the North Cluster teacher working group and 4 grade IV teachers in elementary school who are members of the teacher working group of South Cluster with a total of 8 people.

The results of the effectiveness test can be explained in the aspect of effectiveness, there are 5 respondents (62.5%) who think it is very effective and 3 respondents (37.5%) think that it is effective with an average score of 3.33 in the Very Effective category. This shows that LKPD with discovery learning models is effective for improving student learning outcomes. The results of the attractiveness test can be explained in the attractiveness aspect, there are 6 respondents (75%) who think that LKPD is very interesting and 2 respondents (25%) think it is interesting, with an average score of 3.4 in the very attractive category. This shows that the appearance of LKPD based on discovery learning models according to respondents makes students interested in using LKPD and wants to keep repeating and practicing using LKPD based on discovery learning models.

Instrument Test

At this stage the researcher carried out an instrument test in the form of a test instrument that was tested on 25 Class IV B students of elementary school two kibang. Test this instrument to determine the validity, reliability, difference power, and the difficulty level of the questions. In this validity test using a significant level of 0.05 with n = 25. Based on the calculation results, out of the 30 items that were tested, it turned out that there were 6 items that were invalid because rcount ≥ table, namely items number 4, 12, 14, 18, 21, and 30 so there were 24 valid items. While the questions used to obtain research data were as many as 20 items, so that the items number 3, 8, 19, and 25 were also not used in the study because the rcount was smaller among other items. An instrument is said to be reliability if the test has consistency in measuring the ability to be measured. After calculating the reliability of the LKPD test instrument based on the discovery learning model, the reliability coefficient was 0.90. Based on these results it can be concluded that the test used has very strong reliability criteria. Thus, this instrument can be used in research. The difficulty index is a way of analyzing data to determine the level of difficulty of an item. The results of the analysis of the difficulty level of the instrument items in the test questions were that there were 30 items in the test instrument. From the data that can be seen in the appendix, it is explained that of the 30 items of the trial instrument, 4 questions have a very easy difficulty level, 10 questions have an easy difficulty level, 19 questions have a medium difficulty level, and 1 question has a difficult difficulty level. Based on the results of the study, it is known that there are 2 questions that have a very good difference power, 13 questions have a good difference power, 10 questions have a pretty good difference power, and 5 questions have a poor difference power.

Product Revisions

Revision of the final product is carried out based on the results of field tests 2. Based on the results of field tests 2 that have been conducted, it is found that the LKPD with the Discovery Learning Model is not revised and is feasible to be implemented.

Implementation

At the implementation stage the researcher implemented LKPD with the Discovery Learning model in class IV learning Theme 9 Rich in My Country Sub-theme 3 Conservation of Natural Resources in Indonesia, in the experimental class (Class IV A elementary school one margajaya with 22 students) and control class (Class IV A elementary school two kibang with a total of 20 students).

Hypothesis Test Results

The results of the first hypothesis testing that have been carried out by the researcher show the realization of the development of LKPD with a discovery learning model that was developed using the research and development method of Brog & Gall, which consists of ten development steps. The results of the second hypothesis test showed that the results of the effectiveness test were in the form of an increase in the results of the students' pretest and posttest with an average n-gain value of 0.62 in the "medium" category as in the following table:

Table 9. Calculated N-Gain Results

Aspect	*Pretest*	*Postest*	Gain	Category
Average	44,55	79,32	0,62	Medium

The results of the attractiveness test can be explained that the results of the LKPD attractiveness test with the discovery learning model are 3.40 with the very attractive category. Based on the results of the student questionnaire, the LKPD display based on the Discovery Learning Model is very attractive so that it makes students interested and wants to keep repeating to use LKPD. The results of the third hypothesis test. Based on the test of differences in the learning outcomes of students, the tcount was 3.16. To test its significance, the tcount value was consulted with ttable with dk = n1 + n2 - 2 = 22 + 20-2 = 40, and a significance level of 0.05 was obtained by a value of ttable = 2.021. So that the average tcount of the post-test result value = 3.16 > t table = 2.021, it means that there are differences in the learning outcomes of students who use discovery learning-based thematic LKPD with students who do not use LKPD.

IV. Discussion

1. Product Development LKPD Based on Discovery Learning Model.

The development of LKPD based on discovery learning models adapting the nine steps of R&D by Borg & Gall (2003: 569-575), the first stage is research and initial information gathering, after the researcher knows the problem that occurs, the researcher plans to develop the LKPD that will be used by students. so as to improve student learning outcomes. Furthermore, the researcher compiles the initial LKPD product development, in this step the researcher sets out the development pattern that will be carried out in the LKPD based on the discovery learning model. The next stage of the initial trial, the researcher conducted a validation test with three validators, with the aim of validating whether the product developed was in accordance with the development requirements so that it was feasible to be tested. After conducting the validation test by the experts, the researcher revised the product based on the suggestions and comments of the validators. Next is field test 1 involving 6 educators. The results of the data obtained are the results of the LKPD effectiveness test with an average of 3.19 in the effective category and the results of the attractiveness test with an average of 3.17 in the attractive category. Then the researchers made revisions to improve the product. Next is the field test phase 2, with 8 respondents, namely teachers of class IV elementary school in the North and South cluster teacher working group with an average effectiveness test result of 3.33 in the very effective category and an average attractiveness test result of 3.40 on very interesting category. The next stage is product revision. Based on the results of field tests 2 LKPD products with discovery learning models are feasible to be implemented. These results indicate that LKPD with discovery learning model is not revised and feasible to be implemented.

The next stage is implementation by providing LKPD based on discovery learning model to students. The six stages are outlined in the LKPD with six stages, namely the stage of problem identification, providing stimulation, collecting data, processing data, proving and concluding. Through the six stages contained in thematic LKPD based on discovery learning models, the activity of students becomes more active in seeking information so that it can improve student learning outcomes. This is in line with the opinion of Suherman, et al. (In Akhmad et al. 2015: 83-84) which states that learning based on the discovery learning model makes students active in learning, students properly understand the learning material, students find themselves a week causing a sense of satisfaction, students who acquiring knowledge with the discovery method will be better able to transfer knowledge to various contexts, train students to learn more on their own, and improve student reasoning and the ability to think freely. Then in line with the results of research conducted by Akinyemi Olufunminiyi Akinbobola and Folashade Afolabi in 2010 with the title Constructivist practices through guided discovery approach: The effect on students' cognitive achievement in Nigerian senior secondary school physics. Published in the Eurasian Journal of Physics and Chemistry Education.

Eurasian J. Phys. Chem. Educ. 2 (1): 16-25. The results showed that the guided discovery approach was effective in developing student achievement in physics after learning with pictures.

2. **The effectiveness and attractiveness of thematic LKPD based on the Discovery Learning model on student learning outcomes**

The effectiveness test is used to see the learning outcomes of students. Based on the effectiveness test using n-gain, it was found that the learning outcomes of students were 0.62 in the "medium" category. It can be concluded that discovery learning-based thematic student worksheet is effective for improving student learning outcomes. This is in line with research conducted by Joy (2014) entitled Impact of Discovery-Based Learning Method on Senior Secondary School Physics which was published in the Journal of Research & Method in Education. Volume 4 No 3. Hal 32-36, shows the results that discovery-based learning methods can help in teaching and learning physics effectively and increase students' knowledge. At the implementation stage, the results of the effectiveness test were seen from the increase in students' pretest and posttest scores with an increase in the average N-Gain of 0.62 in the moderate category. The results of the LKPD attractiveness test were seen after the learning activities were completed, namely after the sixth learning. The attractiveness test shows the result of 3.40 with very interesting category. Thus it can be said that discovery learning-based LKPD attracts students to use and want to continue to repeat and practice using LKPD, students find it easy to use and understand the material with this LKPD. This is because in the student worksheet there is a discovery learning model. According to Hosnan (2014: 287-288) discovery learning models have advantages including:

a. Helping students to refine and enhance cognitive skills and processes.
b. Can improve students' ability to solve problems.
c. The knowledge gained through this strategy is very personal and powerful because it enhances understanding, memory, and transfer.
d. This strategy allows students to develop quickly and at their own pace.
e. This strategy help students strengthen their self-concept, because they gain the confidence work with others.
f. Student-centered and the teacher plays an active role in issuing ideas.
g. Encourage student active involvement.
h. It generates students' joy, because of the growing sense of investigation and success.
i. The learning process situation becomes more aroused.
j. Students will understand the basic concept of ideas better.
k. Train students to learn independently.
l. Increase the level of appreciation in students.

The developed LKPD adapts the material to the surrounding environment, which clearly has been experienced by the students themselves. In addition, the results of research on the development of LKPD are relevant to research conducted by Toman Research (2013) with the title Extended Worksheet Developed According To 5e Model Based On Constructive Learning Approach. Published in the International Journal on New Trends in Education and Their Implications Volume 4 No 4. Pp 173–183, shows the results that worksheets can activate students and promote successful, behaviors that individuals learn by trying to be more effective than they gain by listening or see.

3. **Differences in Student Learning Outcomes**

Based on the results of the tests conducted, it was found that the experimental class learning outcomes average was 78.57 and the control class learning outcomes average was 69.75. Based on the test of differences in learning outcomes of students who use LKPD based on the Discovery Learning Model and students who do not use LKPD with the Discovery Learning Model, the tcount is 3.16. To test its significance, the tcount value was consulted with ttable with dk = n1 + n2 - 2 = 22 + 20-2 = 40, and the significance level of 0.05 was obtained by the value of t table = 2.021. So that the average tcount of the post-test result value = 3.16> t table = 2.021, it means that there are differences in the learning outcomes of students who use LKPD based on the Discovery Learning Model with students who do not use LKPD based on Discovery Learning Model.

This is in line with the results of research conducted by Luzviminda J. Achera, Rene R. Belecina & Marc D. Garvida in 2015 entitled The Effect Of Group Guided Discovery Approach on Theperformance of Students in Geometry. Published in the International Journal of Multidisciplinary Research and Modern Education (IJMRME). Volume I, Issue II. The results showed that the performance of students taught using guided discovery was significantly higher than students taught using the traditional approach.

4. **The advantages of developing LKPD based on the Discovery Learning Model**

Based on the results of the development of discovery learning-based LKPD, it has several advantages, namely:

a. The content of the teaching materials in discovery learning-based LKPD is in accordance with the 2013 curriculum and according to the needs of students in relation to the surrounding environment.

b. Learning activities direct students to be actively involved in the learning process. This can reduce the occurrence of students making a rowdy atmosphere during the learning process.
c. The learning material presented is in accordance with the theme of my rich country, namely by exemplifying either interesting pictures or direct activities related to the students' immediate environment, thereby making it easier for students to accept and analyze the learning they have learned.
d. This LKPD teaching material, the concept of material is obtained based on discovery learning steps that will lead students to build and discover their knowledge independently.
e. This LKPD teaching material can be used individually according to the differences in the learning characteristics of each student.

5. Limitations of the Development of LKPD based on the Discovery Learning Model
Based on the results of research, the development of LKPD based on discovery learning models has several limitations, namely:
a. This product development includes only one sub-theme, from three sub-themes in the theme of my rich country.
b. The development steps are used up to step 10 but for the implementation stage it is only limited to product implementation in this development research.
c. Researchers have difficulty finding supporting materials that are in line with the theme of my rich country, especially for the Lampung area.
d. Limitations in compiling research instruments as well as research instruments that are tested only once so that there may be errors in responding to the instrument.

V. Conclusion

The results of research and development have concluded that:
1. The realization of LKPD development with a discovery learning model that was developed using the research and development method from Brog & Gall, which consists of ten development steps. This LKPD contains material that is in accordance with the environment where students live, and is equipped with exercises in the form of images as a media for observation that can foster critical thinking skills of fourth grade elementary school students. The product produced in this research is LKPD based on discovery learning model with the theme of my rich country, the sub-theme of the preservation of natural resource wealth in Indonesia for grade IV elementary school which is designed with the 2013 curriculum.
2. LKPD products based on discovery learning models that are developed are effective and attractive in improving student learning outcomes. This is evidenced by the increased learning outcomes of students significantly.
3. There are differences in the learning outcomes of students who use thematic LKPD based on discovery learning models with learning outcomes of students who do not use thematic LKPD based on discovery learning models in grade IV elementary school. The learning outcomes for grade IV A elementary school one margajaya are higher than those for grade IV A at elementary school two kibang**.**

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