

Work Sheet Development through Higher Order Thinking Skills Based on Thematic Learning in 5th Grade of Primary School

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Abstract:

One of the demands of the 2013 curriculum is that learning must be integrated with the training of students' skills in higher-order thinking or HOTS. The ability of HOTS helps students not only know and understand a knowledge but is able to find the connectedness of information knowledge, involves the process of finding the concept of knowledge and applying knowledge to face a number of problems. The research was conducted at SD Negeri 040460 Berastagi in the odd semester of the 2019/2020 school year with theme 1: Animal and Human Motion Organs with sub theme 2: Human and Environment on Indonesian content. Based on the results of research and discussion, that the validity of the product seen from the design validator with the two validation system obtained very valid results with an average score of 84.61%. Likewise the results of the validators from the material experts who obtained an average score of 88.88 and were declared very valid with a two-time validation system. The conclusion of the linguist stated that the assessment of the design of LKPD language presentation based on high level thinking skills was in the very valid category with an average of 82.95%.

Keywords: teaching materials; HOTS; thematic learning

I. Introduction

The development of learning oriented to higher order thinking skills or HOTS is a program developed as an effort of the Ministry of Education and Culture through the Directorate General of Teachers and Education Personnel (DG GTK) in an effort to improve the quality of learning and improve the quality of graduates. This program was developed following the policy direction of the Ministry of Education and Culture which in 2018 has integrated Strengthening Character Education and learning oriented at Higher Level Thinking Skills or HOTS.

The education process that can prepare human resources with high-level thinking skills has become a global need. Education has an important role in shaping the knowledgeable, capable, creative, innovative human resources so that they can compete in the global arena. Therefore, the quality of education of a nation is very influential on the human resources it produces.

The quality of education is a direct consequence of a change and development of learning at this time (Sutjipto, 2014: 24). The government is aware of this so that in its implementation, education uses guidelines that are always developed in accordance with the times that are called the curriculum. This is as stated in the meaning of education in Indonesia which is written in Law no. 20 of 2003 concerning the National Education System that the curriculum is a set of plans and arrangements regarding the objectives, content and learning materials as well as the methods used to guide the implementation of learning activities to achieve certain educational goals.

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Change is always encouraged to build a better education. At the moment, the curriculum being developed is the 2013 curriculum which includes competency attitudes, knowledge and skills that are integrated in accordance with the needs of students. The characteristics of elementary school children lies in the development that is holistic or integrated. The approach used is an integrated thematic approach, where the separation of subjects is increasingly unclear. Learning materials are combined into a unified whole by using themes to link several subjects so as to provide meaningful experiences for students.

The scientific approach to the learning process is more student-centered so that they are more active in understanding what is learned based on what they find in the field in accordance with their daily lives. Based on the 2013 curriculum, the thing to be achieved in learning is that students have scientific thinking skills which include observing, asking questions, processing information, presenting information, and concluding. Therefore, the 2013 Curriculum assessment system is not only oriented towards the end of learning, but is focused on the learning process.

One of the demands of the 2013 curriculum is that learning must be integrated with the training of students' ability skills in higher-order thinking or HOTS. The ability of HOTS helps students not only know and understand a knowledge but is able to find the connectedness of information knowledge, involves the process of finding the concept of knowledge and applying knowledge to face a number of problems. In accordance with the elements of change in the 2013 curriculum that is used today at the elementary school level is the strengthening of the learning process. Through the strengthening of the learning process it is hoped that it can improve the quality of learning more effectively, efficiently, fun, and meaningfully, so that it can improve the quality of the achievement of learning outcomes and promote students' critical thinking. In the 2013 curriculum guide student book there are student activities that have activated students with a scientific approach. Student activities take the form of observing, asking questions, gathering information, processing information and communicating.

II. Literature Review

2.1. Definition of Thematic Learning

According to the stage of child development, the characteristics of the way children learn, the concept of learning and meaningful learning, the learning activities for elementary school children should be done with thematic learning.

Thematic learning as a learning model is one of the types rather than an integrated learning model. The term thematic learning is basically an integrated learning model that uses themes to link several subjects so as to provide meaningful experiences for students (MONE, 2006: 5).

Thematic learning can be interpreted as a learning activity by integrating the material of several subjects in one theme / topic of discussion. Sutirjo and Sri Istuti Mamik (2004: 6) state that thematic learning is an effort to integrate knowledge, skills, values, or learning attitudes, as well as creative thinking using themes.

Thematic learning is integrated learning that uses themes to link several subjects so as to provide a meaningful learning experience to students (Trianto, 2011: 39). Meaningful in thematic learning means the study of a phenomenon from various aspects which will have a meaningful impact on the material being studied. Authentic in thematic learning allows students to understand directly the concepts and principles that they want to learn (Majid, 2014: 80, 90-91).

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2.2. Higher Order Thinking Skill (HOTS)

High-level thinking skills or HOTS is a person's thinking skills that can apply new information or knowledge to manipulate information in an effort to find possible solutions or answers to a new problem. If the problems encountered cannot be solved in the usual way and the problems are quite complex, then higher level thinking skills are needed.

Higher order thinking skills or HOTS include critical, logical, reflective, metacognitive, and creative thinking skills. Critical thinking skills are needed in solving problems and making decisions. Meanwhile, to be able to think critically, students must be able to think logically, reflectively and have initial knowledge related to the problems faced.

According to Tomei in (Sani 2019: 2), higher order thinking skills include transformation of information and ideas. This transformation occurs when students analyze, synthesize, or combine facts and ideas, generalize, explain, or arrive at a conclusion or interpretation. Manipulating information and ideas through the process will enable students to solve problems, gain understanding, and find new meaning.

According to some experts, the definition of higher-order thinking skills, one of them from Resnick in DG GTK (2018: 5), is a complex thought process in breaking down material, making conclusions, building representations, analyzing, and building relationships by involving the most basic mental activities. This skill is also used to underline various high-level processes according to Bloom's taxonomic level. According to Bloom, skills are divided into two parts. First is low level skills that are important in the learning process, namely remembering, understanding and applying, and second are classified into higher level thinking skills in the form of analysing, evaluating, and creating.

According to King, higher order thinking skills include thinking critical, logical, reflective, metacognitive, and creative, while according to Newman and Wehlage (Widodo, 2013: 162) with higher order thinking students will be able to distinguish ideas or ideas clearly, argue well, able to solve problems, able to construct explanations, able to hypothesize and understand complex things become clearer. Adi W. Gunawan in his book Genius Learning Strategy defines Higher Order Thinking (HOT) as a strategy with a high-level thinking process, where students are encouraged to manipulate information and ideas in certain ways that can give them new understanding and implications.

2.3 The Nature of Student Worksheets

LKPD which was originally known as Student Worksheet (LKS) is a collection of sheets containing student activities that enable students to do real activities with the objects and problems being studied. LKPD is one of the learning resources that can be developed by the teacher as a facilitator in learning activities. LKPD is a learning tool, because it can be used together with other learning resources.

One of the learning tools that can be used by teachers in learning activities is the Student Worksheet (LKPD). LKPD is a type of handout to help students learn in a directed manner (Fadliana, et al., 2013). LKPD is a worksheet that contains guidelines for students to carry out activities that reflect scientific process skills so that students acquire the knowledge and skills they need to master. The intended skills are observing, classifying, communicating, predicting and drawing conclusions (Pratama, et al., 2014). The development will make students able to find facts, develop concepts, theories, and scientific attitudes and can positively influence the quality of the educational process and educational products.

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Student Worksheet is one type of teaching material which is a learning tool as a complement or a means of supporting learning implementation. In the world of education we know that there are several tools contained in learning activities such as lesson plans, syllabi, LKPD and so forth. The learning process requires learning tools as one of the important components developed by educators for students.

According to the Ministry of National Education (2008: 13), LKPD (student worksheets) are sheets containing tasks that must be done by students, usually in the form of instructions, steps to carry out activities in the learning process. Student Worksheet (LKPD) is a student guide used to develop cognitive aspects as well as guidelines for the development of all aspects of learning in the form of guidelines for investigating or solving problems according to indicators of learning outcomes that must be achieved (Trianto, 2010: 111).

This is in accordance with the definition of LKPD according to Andi Prastowo (2013: 204) where student's worksheets are defined as a printed teaching material in the form of sheets of paper containing material, summaries, and instructions for implementing learning tasks that must be done by students with reference to Basic Competence (KD) that must be achieved. Meanwhile, according to Daryanto (2014: 175) LKPD are sheets containing tasks that must be done by students. Hosnan (2014: 116) states that LKPD is part of the print media that becomes teaching material so that it can be used by teachers in the teaching process.

III. Research Methods

The research was conducted at SD Negeri 040460 Berastagi in the odd semester of the 2019/2020 school year with theme 1: Animal and Human Motion Organs with sub theme 2: Human and Environment on Indonesian content. Preliminary research was conducted in February 2019 and development research began in July 2019 until January 2020.

The reason the researchers chose the research site at the elementary school was because the teachers at the school did not understand the use of LKPD and were unable to create a HOTS-based LKPD. Needs analysis includes observations of teachers about the need for teaching materials on student worksheets based on higher order thinking skills (HOTS) on theme 1: Animal and Human Motion Organs with sub theme 2: Humans and the Environment on Indonesian content.

IV. Discussion

Based on the results of the analysis of researchers relating to the curriculum used in learning Indonesian in 5th grade of Primary school at SD Negeri 040460 Berastagi, there are Core Competencies, Basic Competencies and indicators of achievement of learning competencies in the 2013 curriculum to be achieved with a level 3 cognitive level, but on the worksheet of students there are no activities and problems that invite students to think critically.

Table 1. Learning Objectives with Carrying Capacity

| No | Learning objectives | Carrying capacity |
|----|---|-------------------|
| 1. | Through the text they read, students are able | Poor support |
| | to identify information in detail and correctly | |
| 2. | Through question and answer, students are | Does not support |
| | able to group information into what aspects, | |
| | where, when, who, why and how correctly. | |

3. Through discussion, students can present the results of grouping information into aspects, what, where, when, who, why, and how in mind maps correctly.

Table 2. Framework for Work Sheet Development Design Preparation

| No. | Display Compilation | Template |
|-----|---|--|
| 1. | Title Page | A season and the property of the season of t |
| 2. | basic competencies, indicators and objectives Learning | DESCRIPTION OF THE PROPERTY OF |
| 3. | Work Sheet Development 1 | Description of the second of t |
| 4. | Work Sheet Development 2 | And the second s |
| 5. | Work Sheet Development 3 | Secretaria servicia del constitución de la constitu |

Table 3. Design Expert Validation Results

| Assessment Aspect | Assessment Variable | Assessment Indicator Validator Assessment | | | | |
|---------------------------|----------------------------|--|---|---|---|---|
| | | | 1 | 2 | 3 | 4 |
| Percentage of eligibility | Presentation Techniques | 1. Systematic consistency of presentation in learning activities | | | | 1 |
| | | 2. Clarity of the presentation of study instructions | | | | V |
| | | 3. Conceptual noise | | | | 1 |

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| | Supporting | 1. Material and assignments | | , | | |
|--------------|--------------|----------------------------------|--|---|-----|----|
| | Presentation | stimulate students to think | | | | |
| | | creatively, critically and | | | | |
| | | logically | | | | |
| | | 2. Accuracy in selecting images | | | | |
| | | according to the material | | | | |
| | | 3. The questions in the activity | | | , | |
| | | encourage students to think | | | | |
| | | high level | | | | |
| Presentation | Learning | 1. Student involvement in | | | | |
| | Presentation | learning activities | | | | |
| | | 2. Activities presented can | | | , | |
| | | foster student curiosity | | | √ | |
| Language | Material | 1. Material digestibility and | | | | |
| and | Quality and | logical exposure | | | | |
| Appearance | Display | 2. Ease of language | | | | |
| | | comprehension | | | | |
| | | 3. Linkages between learning | | | | |
| | | activities | | | | |
| | | 4. The suitability of the image | | | | |
| | | in clarifying the material | | | ļ., | |
| | | 5. Accuracy in selecting images | | | | |
| Score | | | | 6 | 15 | 20 |
| Total Sco | 41 | | | | | |

The total score for each statement is multiplied by the weight of the score according to the Likert scale. The maximum score on the Likert scale is multiplied by the number of items, so the result is the result of observation. The expected maximum score is $4 \times 13 = 52$. Calculation of the percentage of material experts is as follows:

Percentage of eligibility =
$$\frac{41}{52}$$
 x 100%

Percentage of eligibility = 78,84%

The results of the validation of the first meeting of the validator showed that the design contained in the student worksheet based on high level skills was in the criteria of "Good" with a percentage of eligibility of 78.84%.

Then the second validation is done by the same design expert in revision on the validator's suggestion. The results of the validation assessment by design experts are as follows:

Table 4. Validation Results 2 Design Experts

| Table 4. Validation Results 2 Design Experts | | | | | | | | |
|--|--------------|------------------------------|------------|---|---|---|--|--|
| Assessment | Assessment | Assessment Indicator | Validator | | | | | |
| Aspect | Variable | | Assessment | | | | | |
| | | | 1 | 2 | 3 | 4 | | |
| Eligibility | Presentation | 1. Systematic consistency of | | | | | | |

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| Score | <u> </u> | images | | 15 | 32 |
|--------------|--------------|---|--|-----------|------------------|
| | | 5. Accuracy in selecting | | | 1 |
| | | in clarifying the material | | | |
| | | 4. The suitability of the image | | | |
| | | activities | | | |
| | | 3. Linkages between learning | | | V |
| | 1 7 | comprehension | | | |
| | Display | 2. Ease of language | | 1 | 1 |
| Appearance | Quality and | | | | ' |
| Language and | Material | foster student curiosity 1. Material digestibility and | | | \ \ \ \ |
| | | 2. Activities presented can | | | 1 |
| | Presentation | learning activities | | | |
| Presentation | Learning | 1. Student involvement in | | | |
| | | think high level | | | |
| | | activity encourage students to | | $\sqrt{}$ | |
| | | 6. The questions in the | | | 1 |
| | | material | | | |
| | | 5. Accuracy in selecting images according to the | | V | |
| | | logically | | V | |
| | | creatively, critically and | | | |
| | Presentation | stimulate students to think | | | |
| | Supporting | 4. Material and assignments | | 1 | |
| | | 3. Conceptual noise | | | V |
| | | of study instructions | | | |
| | | 2. Clarity of the presentation | | | 1 |
| Presentation | Techniques | presentation in learning activities | | | |

The total score for each statement is multiplied by the weight of the score according to the Likert scale. The maximum score on the Likert scale is multiplied by the number of items, so the result is the result of observation. The maximum expected score is $4 \times 13 = 52$. Calculation of the percentage of material experts is as follows:

Percentage of eligibility =
$$\underline{47}$$
 x 100% 52

Percentage of eligibility = 90.38%

In the results of this second validation from the validator shows that the design contained in the worksheet based on high level skills in the criteria of "Very Good" with a percentage of eligibility 90.38%.

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From the two validation assessments conducted by learning design experts it can be shown a recap of the value of the results of the feasibility of the design in its use on the worksheet based on high level thinking skills. The following conclusions from the feasibility of LKPD design in table 5.

Table 5. Design Expert Validation Results in Developing Student Worksheets Based on Higher

Level Thinking Skills (scale 1-4)

| Assessment | Assessment | Assessment Indicator | Validato | r |
|-----------------------------|----------------------------|--|----------|--------|
| Aspect | Variable | | Assessm | ent |
| _ | | | V1 | V2 |
| Eligibility Presentation | Presentation Techniques | 1. Systematic consistency of presentation in learning activities | 4 | 4 |
| | | 2. Clarity of the presentation of study instructions | 4 | 4 |
| | | 3. Conceptual noise | 4 | 4 |
| | Supporting Presentation | 1. Material and assignments stimulate students to think creatively, critically and logically | 2 | 3 |
| | | 2. Accuracy in selecting images according to the material | 3 | 3 |
| | | 3. The questions in the activity encourage students to think high level | 3 | 3 |
| Presentation | Learning Presentation | 1. Student involvement in learning activities | 4 | 4 |
| | | 2. Activities presented can foster student curiosity | 3 | 4 |
| Language and | Material Quality and | 1. Material digestibility and logical exposure | 3 | 4 |
| Appearance | Display | 2. Ease of language comprehension | 2 | 3 |
| | | 3. Linkages between learning activities | 4 | 4 |
| | | 4. The suitability of the image in clarifying the material | 2 | 3 |
| | | 5. Accuracy in selecting images | 3 | 4 |
| Score | | | 41 | 47 |
| Total Scor | re | | 78,84% | 90,38% |

The total score of the assessment from the meeting 1 and 2 meeting validation assessment recap. The results of the design validation assessment by the meeting I design experts have a value of 78.84% with the information to be revised. At the second meeting the results of the evaluation by the validator had a value of 90.38%. Next figure 1:

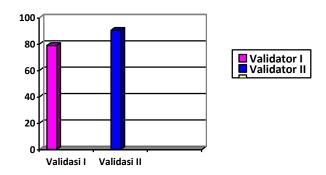


Figure. 1 Design Expert Validation

It can be concluded according to the design expert of LKPD quality from the aspect of the suitability of the design system to the use of worksheet products of students based on high-level skills based on two meetings having a percentage value of 90.38% with the criteria of "Very Good" and worth testing.

Tabel 6. Results of Language Expert Validation

| Assessment | Assessment Indicator | Ass | sessi | ment | t |
|------------------------|---|-----|-----------|------|---|
| Variable | ariable | | | | |
| | | 1 | 2 | 3 | 4 |
| Aspects of Language | 1. The accuracy of sentence structure | | $\sqrt{}$ | | |
| Usage | 2. Effectiveness of Sentences | | | 1 | |
| | 3. Language clarity on the material | | | | |
| | 4. Attract language style | | | | |
| | 5. Using good and correct Indonesian | | | | |
| | language rules | | | | |
| Aspects of language | 1. Clarity of letters | | | | |
| accuracy | 2. Clarity of command / instruction | | | | |
| | words | | | | |
| | 3. The language used is simple, clear and | | | | |
| | easy to understand | | | | |
| Aspects of Suitability | 1. Language adapted to the stages of | | | | |
| of Student | L | | | | |
| Development | 2. Language can stimulate students' | | | | |
| | imagination | | | | |
| | 3. Language is easy for students to | | | | |
| | understand | | | | |
| Score | | | 6 | 21 | 4 |
| Total Score | | 31 | | | |

The total score for each statement is multiplied by the weight of the score according to the Likert scale. The maximum score on the Likert scale is multiplied by the number of items, so the result is the result of observation. The maximum expected score is $4 \times 11 = 44$. Calculation of the percentage of material experts is as follows:

Percentage of eligibility = <u>observation score</u> x 100% maximum score

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Percentage of eligibility = $31 \times 100\%$

Percentage of eligibility = 70.45%

Tabel 7. Validation Results 2 Linguists

| Variables | Assessment | Ass | sess | men | t |
|------------------------|---|-------------|------|-----|-----------|
| Assessment | Indicator | Alternative | | | |
| | | 1 | 2 | 3 | 4 |
| Aspects of Language | 1. The accuracy of sentence structure | | | | $\sqrt{}$ |
| Usage | 2. Effectiveness of Sentences | | | | |
| | 3. Language clarity on the material | | | | |
| | 4. Attract language style | | | | |
| | 5. Using good and correct Indonesian | | | | |
| | language rules | | | | |
| Aspects of language | 1. Clarity of letters | | | | |
| accuracy | 2. Clarity of command / instruction | | | | |
| | words | | | | |
| | 3. The language used is simple, clear and | | | | |
| | easy to understand | | | | |
| Aspects of Suitability | | | | | |
| of Student | student development | | | | |
| Development | 2. Language can stimulate students' | | | | |
| | imagination | | | | |
| | 3. Language is easy for students to | | | | |
| | understand | | | | |
| Score | | | | 6 | 36 |
| Total Score | | 42 | | | |

The maximum score on the Likert scale is multiplied by the number of items, so the result is the result of observation. The expected maximum score is $4 \times 11 = 44$. Calculation of the 2nd percentage of validation from linguists is as follows:

Percentage of eligibility =
$$\frac{42}{44}$$
x 100%

Percentage of eligibility = 95.45%

The results of the second validation of this validator show that the language contained in the worksheet based on high level skills is in the criteria of "Very Good" with a percentage of eligibility of 95.45%.

From the two validation assessments conducted by the learning design expert, it can be shown a recap of the value of the feasibility of the language in its use on the worksheet based on high level thinking skills. The following conclusions from the feasibility of the language in LKPD are shown in table 8:

Table 8. Results of Language Expert Validation in Developing Student Worksheets Based on Higher-Order Thinking Skills (scale 1-4)

| Variables | Assessment | Validator | | |
|-------------------|---|------------|--------|--|
| Assessment | Indicator | Assessment | | |
| | | V1 | V2 | |
| Aspects of | 1. The accuracy of sentence structure | 2 | 4 | |
| Language Usage | 2. Effectiveness of Sentences | 3 | 4 | |
| | 3. Language clarity on the material | 3 | 4 | |
| | 4. Attract language style | 4 | 3 | |
| | 5. Using good and correct Indonesian | 3 | 4 | |
| | language rules | | | |
| Aspects of | 1. Clarity of letters | 3 | 4 | |
| language accuracy | 2. Clarity of command / instruction | 2 | 4 | |
| | words | | | |
| | 3. The language used is simple, clear and | 3 | 4 | |
| | easy to understand | | | |
| Aspects of | 1. Language adapted to the stages of | 3 | 4 | |
| Suitability of | student development | | | |
| Student | 2. Language can stimulate students' | 2 | 4 | |
| Development | imagination | | | |
| | 3. Language is easy for students to | 3 | 3 | |
| | understand | | | |
| Score | | 31 | 42 | |
| Total Score | | 70,45% | 95,45% | |

The results of the recapitulation score assessment of the validation of linguists meeting 1 and meeting 2. The results of the evaluation of language validation by linguists meeting I have a value of 70.45% with the information must be appropriate to be used in the field with revision. At the second meeting the results of the assessment by the validator had a value of 95.45% with information already appropriate to be used in the field.

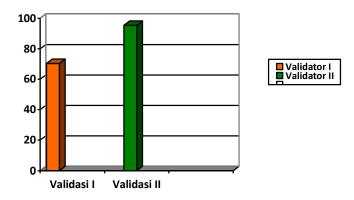


Figure 2. Validation of Linguists

According to linguists that LKPD seen from the aspect of language use, aspects of language accuracy, and aspects of suitability of student development are appropriate to be used in the field. The high level skills-based student worksheet product that has been conducted twice has a percentage of 95.45% with the criteria of "Very Good" and is worth testing.

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| Table 9. Validation Results 1 Expert M | aation | Kesults | 1 | Expert Material | |
|---|--------|---------|---|-----------------|--|
|---|--------|---------|---|-----------------|--|

| No | Aspect | Assessment alternative | | ive | |
|----|--|------------------------|---|-----|----|
| | | 1 | 2 | 3 | 4 |
| 1. | Clarity of material with learning objectives | | | V | |
| 2. | The suitability of the material with the | | | | |
| | competencies students must master | | | | |
| 3. | The material presented on the worksheets of | | | | |
| | students is oriented to higher-order thinking | | | | |
| | skills | | | | |
| 4. | The accuracy of the order of the material | | | | |
| 5. | The suitability of the activities with the | | | | |
| | competencies that must be achieved | | | | |
| 6. | Depth description of the steps of the activity | | | | |
| | according to the level of student development | | | | |
| 7. | Accuracy of material coverage on LKPD | | | | |
| 8. | The suitability of the material with the | | | V | |
| | curriculum | | | | |
| 9. | The connectedness of the material can be seen | | | | |
| | in the steps of the activity | | | | |
| | Total Score | | | 18 | 12 |
| | Percentage Score (p) | 30 | | | · |

The total score for each statement is multiplied by the weight of the score according to the Likert scale. The maximum score on the Likert scale is multiplied by the number of items, so the result of observation. The expected maximum score is $4 \times 9 = 36$. Calculation of the percentage of material experts is as follows:

Percentage of eligibility =
$$\underline{30} \times 100\%$$

Percentage of eligibility = 83.33%

Based on the results of the first validation from the material experts according to Table 4.10 it is stated that the suitability of the material presented with the teaching material based on high level thinking skills LKPD obtained a score of 30 or 83.33%.

These results are included in the "Good" criteria and are declared eligible for use in the field with revisions. The criticisms and suggestions raised by the material validator are: 1) so that each step of the activity is completed with information related to the learning material, 2) so that each theme in the LKPD is given a clear purpose.

Then the second validation was carried out by the same material expert at the revised LKPD according to the validator's criticism and suggestions. The results of the validation assessment by the expert material at the second meeting are as follows:

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Table 10. Validation Results 2 Expert Material

| No | Aspect | Assessment alternat | | | ative |
|----|--|---------------------|---|---|-------|
| | _ | 1 | 2 | 3 | 4 |
| 1. | Clarity of material with learning objectives | | | | V |
| 2. | The suitability of the material with the | | | | V |
| | competencies students must master | | | | |
| 3. | The material presented on the worksheets of | | | | V |
| | students is oriented to higher-order thinking | | | | |
| | skills | | | | |
| 4. | The accuracy of the order of the material | | | | |
| 5. | The suitability of the activities with the | | | | V |
| | competencies that must be achieved | | | | |
| 6. | Depth description of the steps of the activity | | | 1 | |
| | according to the level of student development | | | | |
| 7. | Accuracy of material coverage on LKPD | | | | V |
| 8. | The suitability of the material with the | | | | V |
| | curriculum | | | | |
| 9. | The connectedness of the material can be seen | | | | V |
| | in the steps of the activity | | | | |
| | Total Score | | | 6 | 28 |
| | Percentage Score (p) | 34 | | | |

The maximum score on the Likert scale is multiplied by the number of items, so the result is the result of observation. The expected maximum score is $4 \times 9 = 36$. Calculation of the 2nd percentage of validation from material experts is as follows:

Percentage of eligibility =
$$\frac{34}{36}$$
 x 100%

Percentage of eligibility = 94.44%

The results of the second validation of this validator show that those contained in the worksheet based on high level skills are in the criteria of "Very Good" with a percentage of eligibility of 94.44%.

From the two validation assessments conducted by material experts, it can be shown a recap of the value of the results of the feasibility of the material on the worksheet based on high level thinking skills. The following conclusions from the feasibility of the material in LKPD are shown in table 11:

Table 11. Results of Expert Material Validation on Developing Student Worksheets Based on Higher Level Thinking Skills (scale 1-4)

| No | Aspect | Validator Assessment | | |
|----|---|----------------------|----|--|
| | | V1 | V2 | |
| 1. | Clarity of material with learning objectives | 3 | 4 | |
| 2. | The suitability of the material with the competencies | 4 | 4 | |
| | that students must master | | | |

| 3. | The material presented on the worksheets of students | 4 | 4 |
|----|---|--------|--------|
| | oriented towards higher-order thinking skills | | |
| 4. | Accuracy in order of material | 3 | 3 |
| 5. | Suitability of activities with competencies that must | 4 | 4 |
| | be achieved | | |
| 6. | Depth description of the steps of the activity in | 3 | 3 |
| | accordance with the level of student development | | |
| 7. | Accuracy in coverage of material in Work sheet | 3 | 4 |
| | development | | |
| 8. | The suitability of the material with the curriculum | 3 | 4 |
| 9. | The connectedness of the material can be seen in the | 3 | 4 |
| | steps of activity | | |
| | Total Score | 30 | 34 |
| | Percentage Score (p) | 83,33% | 94,44% |

The results of the evaluation of material validation by expert material on the meeting I have a value of 83.33% with the information must be appropriate to be used in the field with revision. At the second meeting the results of the evaluation by the validator had a value of 94.44% with information already feasible to be used in the field with minor revisions in accordance with the suggestions put forward. The results of the recapitulation of the validation of the expert material for Meeting 1 and Meeting 2 are in the following graph.

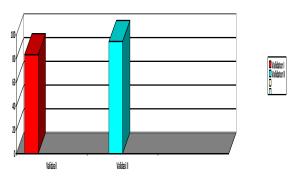


Figure 3. Material Expert Validation

According to the material expert, the LKPD was seen from the clarity of the material, the suitability of the material, the accuracy of the material, and the depth of description in the LKPD, which was declared to be appropriate for use in the field. The high level skills-based student worksheet product that has been conducted twice has a percentage of 94.44% with the criteria of "Very Good" and is worth testing.

After the product in the form of LKPD based on high level thinking skills is developed on theme 1: Human and animal motion organs in human and environmental subthemes 2, then their eligibility is tested with an expert validation questionnaire. Validation results in the form of scores against LKPD assessment indicators based on experts are summarized in Table 12 and figure 4 follows:

Table 12. Results of Expert Validation against LKPD

| No. Validator | Percentage | Valid | Eligibility |
|-----------------------------------|------------|-------|-------------|
| Design Expert | 90% | Valid | Eligible |
| 2. Material Expert | 94% | Valid | Eligible |

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| 3. Language Expert 95% Valid Eligible | |
|---------------------------------------|--|

Table 13. Learning Outcomes Using the High Level Thinking Skill Worksheet based on Small Group Trials

| Assessment | ent Pre-Test | | | Rate | Posttest | | |
|------------|--------------|-------|------------|------|-----------|-------|------------|
| (x) | Frequency | (x.f) | Percentage | | Frequency | (x.f) | Percentage |
| 15 | (f) | 1 - | 10 | 7- | (f) | 7.5 | 10 |
| 15 | 1 | 15 | 10 | 75 | 1 | 75 | 10 |
| 25 | 1 | 25 | 10 | 80 | 1 | 80 | 10 |
| 30 | 3 | 90 | 30 | 85 | 1 | 85 | 10 |
| 35 | 1 | 35 | 10 | 90 | 3 | 270 | 30 |
| 45 | 2 | 90 | 20 | 95 | 4 | 380 | 40 |
| 50 | 2 | 100 | 20 | - | - | - | - |
| Total | 10 | 355 | 100 | - | 10 | 890 | 100 |
| Average | 35.5 | | - | - | 89 | | - |

Based on the above table, it is obtained data that learning outcomes before using the worksheet based on high level thinking skills and its changes in the small group test with an average value of 35.5 with the criteria of "Less" means the value achieved by students needs to be increased again. Whereas student learning outcomes after using students' work sheets based on high level thinking skills and their changes in the small group test with an average rating of 89, with the criteria of "Very Good". It can be said that the use of worksheets based on high level skills has a significant increase. So learning outcomes can be classified into the following graph:

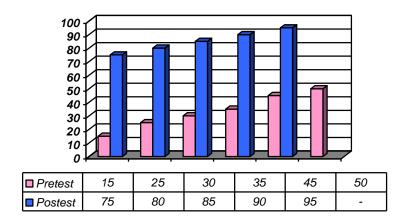


Figure 4. Small Group Learning Outcomes

In the graph above shows that student learning outcomes in the pretest can be rated 50 and under, namely 15, 25, 30, 35, 45 and 50 in small groups. While posttest learning outcomes scored 75 and above, 75, 80, 85, 90, and 95 in small group trials.

Improvement of learning outcomes using the width of students based on high-level thinking skills for small groups can be calculated using the gain score:

(g) =
$$(gain)$$
 = $(Posttest) - (pretest)$
(gain) max $100 - (pretest)$

$$g = 89 - 35.5$$

$$100 - 35.5$$

$$g = 53.5$$

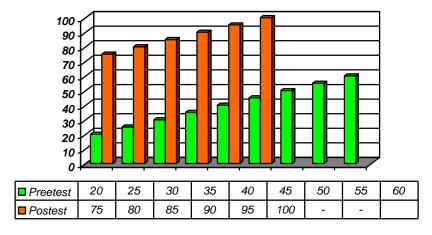
64.5
 $g = 0.83$

Based on the results of these tests, it can be concluded that the increase in student learning test results using students' work sheets based on high level thinking skills and the changes from small group trials increased by 0.83 into the range of $g \ge 0.7$ which can be concluded in the category of "High".

Table 14. Learning Outcomes Using High Level Based Student Worksheets in Large Group Trials

| Rate(x) | Pretest | | | Rate | Posttest | | |
|---------|---------------|-------|------------|------|--------------|-------|------------|
| | Frequency (f) | (x.f) | Percentage | (x) | Frequency(f) | (x.f) | Percentage |
| 20 | 1 | 20 | 3,70 | 75 | 2 | 150 | 7,40 |
| 25 | 3 | 75 | 11,11 | 80 | 3 | 240 | 11,11 |
| 30 | 4 | 120 | 14,81 | 85 | 8 | 680 | 29,62 |
| 35 | 4 | 140 | 14,81 | 90 | 6 | 540 | 22,22 |
| 40 | 2 | 80 | 7,40 | 95 | 5 | 475 | 18,51 |
| 45 | 3 | 135 | 11,11 | 100 | 3 | 300 | 11,11 |
| 50 | 5 | 250 | 18,51 | - | - | - | - |
| 55 | 3 | 165 | 11,11 | - | - | - | - |
| 60 | 2 | 120 | 7,40 | - | - | - | - |
| Total | 27 | 1105 | 100 | - | 27 | 2385 | 100 |
| Average | 40,92 | | - | - | 88,33 | | - |

Based on table 4.15 it can be obtained learning outcomes before using the worksheet based on high-level thinking skills by obtaining an average value of 38.70 with the criteria of "Less" means it needs to increase learning in large groups. While the learning outcomes obtained after using the worksheet based on high level thinking skills gained an average score of 88.70 with the criteria of "Very Good" in large groups. Then it was concluded that there was an increase in large group field trials that were very good and can be shown in the following graph 5:



Graph 5. Large Group Learning Outcomes

In the graph above, it can be seen that the results of the pretest show that student learning outcomes only get 60 points down with grades: 20, 25, 30, 35, 40, 45, 50, 55 and 60. While the learning outcomes of students at posttest get 75 or above namely 75, 80, 85, 90, 95 and 100 in the number of 27 students in large groups.

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Improved student learning outcomes worksheet based on high level thinking skills for large groups can be calculated using the gain score:

(g) =
$$\frac{\text{(gain)}}{\text{(gain)}} = \frac{\text{(Posttest)} - \text{(pretest)}}{100 - \text{(pretest)}}$$

$$g = \frac{88.33 - 40.92}{100 - 40.92}$$

$$g = \frac{47.41}{59.08}$$

$$g = 0.80$$

Based on these test results, it can be concluded that the increase in student learning test results using learners based on high level thinking skills and the changes from large group trials increased by 0.80 into the range $g \ge 0.7$ which can be concluded in the category of "High".

Table 15. Learning Results for Small Groups and Large Groups.

| N | О | Group | Pretest | Posttest | gain | Category |
|---|---|-------------|---------|----------|------|----------|
| 1 | | Small Group | 32 | 89 | 0,83 | High |
| 2 | | Big Group | 38,70 | 88,70 | 0,80 | High |

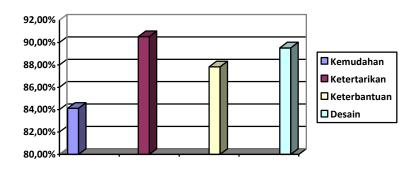
It can be concluded that student learning outcomes in small groups with a gain value of 0.83 in the "High" category and in large groups with a gain value of 0.80 in the "High" category.

Field trials conducted at SD Negeri 040460 Bearstagi This trial was conducted on 37 fifth grade students consisting of 2 groups: 10 small groups of students and 27 large groups of students. The purpose of this response questionnaire is to see students' interest in using worksheets based on high-level thinking skills in relation to the learning process of students in class. The results of trials on LKPD applied to class V in SD Negeri 040460 Berastagi are as follows:

Table 16. Student Response Results against High Level Thinking Skills Based LKPD

| No | Assessment Aspect | Score | Average | Criteria |
|---------|-------------------|-------|---------|-----------|
| 1 | Ease | 249 | 84,12% | Very Well |
| 2 | Attraction | 268 | 90,53% | Very Well |
| 3 | Assistance | 261 | 87,83% | Very Well |
| 4 | The design | 265 | 89,52% | Very Well |
| Average | | 1043 | 88,00% | Very Well |

From the results of student responses it can be concluded that LKPD based on High Level Thinking Skills is included in the "very good" criteria to be developed according to the student response questionnaire with an average of 88.00%. The percentage results collected based on aspects of the assessment of ease, attraction, help and design developed include 84.12% ease with very good criteria, the interested of 90.53% with very good criteria, assistance 87.83% with very good criteria and design of 89.52% with very good criteria. Thus it can be concluded in the following graph:



V. Conclusion

The results of research and discussion, that the validity of the product seen from the design validator with the two validation system obtained very valid results with an average score of 84.61%. Likewise, the results of the validators from the material experts who obtained an average score of 88.88 and were declared very valid with a two-time validation system. The conclusion of the linguist stated that the assessment of the design of LKPD language presentation based on high level thinking skills was in the very valid category with an average of 82.95%. From the results of 3 validator experts after going through 2 times of overall validation it can be stated that the worksheet products of students based on high-level thinking skills developed are feasible to be used in the field without revision with a very valid category.

The results of the effectiveness of the product indicate that LKPD based on high level thinking skills on the theme of human and animal organ movements can effectively improve learning outcomes on the theme of human and animal organ in the fifth grade of SD Negeri 040460 Berastagi. It was based on the results of small group and large group field trials that were analyzed based on the gain score test of learning outcomes obtained a score of 83 and 81 or high category.

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