THE DEVELOPMENT OF PROJECT-BASED STUDENTS WORKSHEET (LKS) ACCORDING TO THE LEARNING DESIGN EXPERTS TO IMPROVE THE CIVICS EDUCATION (CIVICS) LEARNING OUTCOMES OF GRADE IV STUDENTS OF SD ISLAM PERMATA AMANDA MEDAN MARELAN, INDONESIA

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ABSTRACT: *The role of teachers at as facilitators, where the procurement of LKS is expected to change the learning conditions from which the teachers typically play a role determining what is learned into how to provide and enrich the students' learning experience in civics education. The results of the material validator conclusions in each aspect of the overall assessment can be stated that the Project-based Student Worksheet (LKS) is feasible to be used in the field without revision and is valid, then the language validator in each aspect of the overall assessment may be stated that the Project-based Student Worksheet (LKS) is feasible to use in the field with revisions and is very valid. While the conclusions of the design learning validator on each aspect of the overall assessment can be stated that the Project-based Student Worksheet (LKS) is feasible to be used in the field without revision and is valid at grade IV Students of SD Islam Permata Amanda Medan Marelan, Indonesia.*

KEYWORDS: Students' Worksheet; Design Expert; Civics Education; Learning Outcomes

INTRODUCTION

The development of the student worksheet (LKS) can answer the students' difficulties in learning and solving the problems. The implementation of LKS can help the schools in realizing the learning quality. The implementation of LKS can provide better planned, independent, complete learning activities and with clear output. The use of LKS in the learning process has been proven to improve the students' learning outcomes. This can be seen from the research results conducted by Nur Endah Assalma about the development of the students' worksheet with Project Based Approach (PBP) and theme insight. The Student Worksheet (LKS) of the development result has been tested on average validity and stated very valid by the three validators with the result of appraisal of 88.45%. The developed LKS of Citizenship Education (Civics) result shows the average value of the students' learning outcomes of 90.27. The teachers and the students provide very high responses to the application of the developed Student Worksheet (LKS) results with PBP approach and theme insight which are valid.

The use of LKS should be implemented in daily learning practices in educational units because the success determinants of a learning lies in the competence of a teacher in managing the learning and the learning components that mutually support each other. As Rusman (2011: 1) argues, learning is a system, consisting of various components that are interconnected with each other. These components include: objectives, materials, methods and evaluation. The four components of learning must be considered by teachers in choosing and determining what

learning models will be used in learning activities. Teaching materials in the form of LKS as a learning component is expected teachers can develop in accordance with the needs of students.

The role of teachers as facilitators, where the procurement of LKS is expected to change the learning conditions from which the teachers typically play a role determining what is learned into how to provide and enrich the students' learning experience in Civics Education. There are many LKS available but not in accordance with the characteristics of students and the existing LKS has not yet contained many student projects/activities.

LITERATURE REVIEW

The Developed Student Worksheet (LKS)

Setyosari (2015: 197) states development in a very general sense means growth, slow change (evolution), and gradual change. Growing means that process is continually evolving toward perfection, whereas changing is becoming unlike the original, meaning it is expected to change into a better and perfect. Because of the subject here is education, it is expected that education will be ideal and perfect through certain stages or processes, need careful planning, manifestation of the planning, and evaluation of each program that has been run.

Wiryokusumo (2011: 48) argues that the essence of development is the effort of education both formal and non formal conducted, planned, directed, organized and consciously responsible in order to introduce, cultivate, guide, develop a basic personality balance, whole, knowledge, skills according to talents, desires and abilities, as a provision for self-initiative to add, improve, develop themselves towards achievement of dignity, quality and optimal human ability and self independent. According to the experts' opinions above, they suggest that the development is an effort made consciously, planned, directed to make or to improve, so it becomes an increasingly useful product to improve the quality as an effort to create a better quality.

Technical Requirements for the Student Worksheet (LKS) Arrangement

The technical requirements emphasize the presentation of the Student Worksheets (LKS), namely in the form of writing, pictures and appearance.

1) Writing

a. Using the printed letters and do not use Latin or Roman letters.

b. Using bold, rather large bold for topics, not ordinary underlined letters.

c. Using short sentences, no more than 10 words in a line.

d. Using frames to distinguish the command sentences with the students' answers.

e. Trying to compare the size of the letters with the size of the image harmonious.

2) Pictures

A good picture for LKS is an image that can effectively convey the message/content of the image to the LKS user.

3) Display

Display is very important in the Student Worksheet (LKS). The students will first be interested in the appearance rather than the content.

The Student Worksheet (LKS) is one of the many media used in teaching and learning in schools. In learning subjects, LKS widely used to provoke the students' learning activities because with the LKS, the students will feel given moral responsibility to complete a task and feel the need to do it, especially if the teacher gives full attention to the results of student work in the LKS.

Project Based Learning

Model is something that describes the pattern of thinking. A model usually describes a whole concept of interrelatedness. In addition, according to Meyer in Trianto, (2009: 21) states that "inn natural, model is defined as an object or concept used to present something, Something real and converted to a more comprehensive form." According to Joyce and Weil in Rusman (2014: 133), "Learning model is a plan or pattern that can be used to shape the curriculum (long-term learning plan), design the learning materials, and guide the learning in the classroom or another". Learning models can be a choice pattern. It means the teachers may choose the appropriate and efficient learning model to achieve the purpose of education.

Based on the two opinions above, it can be concluded that learning model is a conceptual framework that describes the systematic procedure in organizing the learning experiences to achieve certain learning objectives and serves as a guide for learning designers and the teachers in designing and implementing the teaching and learning process.

Learning is the process of interaction between the students with their environment so that there is a change of behavior to a better direction. Personal, (2009: 6) defines the term of learning as "a set of events embedded in purposeful activities that facilitate learning". The point is that learning is a series of activities deliberately created with the intent to facilitate the occurrence of the learning process. The learning process has a purpose so that the students can achieve the competencies as expected. To achieve these objectives the learning process needs to be systematically designed with the learning model.

Learning model is a plan or a pattern used as a guide in planning the learning in the classroom or learning in the tutorial. Arends (1997: 7) states "learning model refers to the learning approaches to be used, including instructional goals, stages in learning activities, learning environments, and classroom management". From the above description, it can be concluded that learning model is a plan used as a guide in planning the learning in the classroom or learning for the purpose of learning is achieved.

METHODOLOGY

Place and Time of Research

This research was conducted at SD Islam Permata Amanda Marelan of Class IV in even semester of academic year 2016/2017 on the subject of Civic Education (Civics). The researcher chose this SD Islam Permata Amanda, because the similar research has never been implemented in the school. Furthermore, in SD Islam Permata Amanda, there is no

development of project-based Student worksheets (LKS) applied by teachers especially the Citizenship Education subjects (PKN), the Government System and the Central Government Component. The research was conducted from February to April 2017.

Research Subjects and Objects

The subjects in this research are the fourth grade students of SD Islam Permata Amanda Medan Marelan which amounted to 29 people and the object in this study is the Student Worksheet (LKS) on the subject of project-based Civics Education (Civics).

Variables and Definitions of Operational Variables

The operational definition variables involved in this research can be explained as follows:

a. Project Based Learning Model is a model or series of learning activities based on a project or activity to produce a work in the form of a student product.

b. Effectiveness is the existence of conformity which indicates the extent to which the plan can be achieved in accordance with the objectives. Learning is said to be effective when it has achieved the desired goals, both in terms of learning objectives and the maximized students' achievement.

c. The result of learning Citizenship Education (Civics) is the ability of the students after experiencing the process of learning experience so that they master the concept and benefits of Citizenship Education (Civics) in everyday life.

d. Student response is the students' responses to the project-based Student Worksheet (LKS) developed.

The validation sheet of the Student Worksheet (LKS) is a research instrument used to measure the validity of the developed LKS. The validation sheet will be filled by the experts who are commonly called validators. The validation sheet is given to 1 design learning expert. The validator is required to write the corresponding score by ticking ($\sqrt{}$) on the corresponding row and column. The assessment criteria are the scores of 1 (not good), 2 (less good), 3 (good), and 4 (very good). The instrument grid of the LKS validation is presented in Table 1.

Table.1: Instrument Grid of Learning Design Expert

Assessment Aspect	Assessment Indicator	Grid Assessment	Number of Item
Feasibility of Presentation	Presentation Techniques	1. Systematic consistency of serving in learning activities	1
		2. order of concept	1
	Supporting Presentation	3. Examples of problems in learning activities	1
		4. Problem training at the end of learning	1
		5. The accuracy of picture selection	1
		6. Accuracy of selection the image color	1
		7. The accuracy of story selection	1
		8. Introduction	1
		9. Student involvement in learning activities	1

Presentation	Learning Presentations	10. Encourage students to answer in their own way	1
Language	Coherence and Mindset Thinking	11. Interrelationship between learning activities	1
		12. Presentation Time	1
		13. Ease of language understanding	1
Picture Selection	Quality of LKS Display	14. Display	1
		15. Illustration	1

Validation Sheet of Learning Result Test

The collected data with this validation sheet is about the test validity of learning result. The validation of the learning result test is given to 1 expert who is called the validator. The validator is required to tick the list (√) on rows and columns corresponding to category V (Valid), VR (Invalid with Revision), TV (Invalid). The instrument grid of the test result validation is presented in Table 2 below:

Table.2; Validation Instrument Grid of Learning Result Test

No	Indicator	Number of Item	Cognitive Domain	V	VDR	TV
1	▪ Describe the understanding of government and government system	1-3,22				
2	▪ Mentioning which includes the legislative, judicative and executive institutions	4-6,8, 24,25				
3	▪ Describing the functions of the legislative, judicial and executive bodies	7, 9, 10 13-15				
4	▪ Knowing the presidents of Indonesia from the first until now	12 23				
5	▪ Identifying the role of President and vice president of Indonesia	11,21				
6	▪ Knowing the ministers of *work cabinet*	16-20				

The quality of this instrument of learning result test is analyzed through the expert validation, and then the test can be performed.

Test Results Learning

The learning result test instrument is a pre-test and post-test used to assess the improvement and effectiveness of the Students Worksheet (LKS) through the quality of the student learning outcomes at the beginning and after the completion of the lessons learned during 3 x meetings in the Lesson Plans (RPP).

The learning test outcomes on the Citizenship Education (Civics) learning is about the material of *Understanding the Government and the Components of Indonesian Government.* The grid of learning result test of Citizenship Education (Civics) can be seen in Table 3 below:

Table. 3: Grid Instruments of Learning Result Test

No	Indicator	Cognitive Domain	Number of Item	Total
1	▪ Explaining the meaning of government and the government system	C2 C2 C1 C1	1 2 3 22	4
2	▪ Mentioning which includes the legislative, judicial and ekskutif institutions	C2 C1 C2 C3 C2 C1	4 5 6 8 24 25	6
3	▪ Describing the functions of the legislative, judicial and executive bodies	C2 C2 C2 C1 C2 C2	7 9 10 13 14 15	6
4	▪ Knowing the presidents of Indonesia from the first until now	C1 C1	12 23	2
5	▪ Identifying the role of President and vice president of Indonesia	C2 C3	11 21	2
6	▪ Knowing the ministers of *work cabinet*	C2 C2 C2 C1 C2	16 17 18 19 20	5
	Total of Test Items			25

Note:

C1 = Knowledge

C2 = Understanding

C3 = Implementation

After being validated, the test of learning outcomes is tested to the students who are not the samples in the research. The test aims to obtain a valid and reliable test. The tests use the validity test, reliability test, difficulty test, and different power test as follows:

Validity test is used to measure the accuracy and accuracy of a test in measuring data in accordance with its competence. According to Sudijono (2012: 185) validity test can use the formula:

$$r_{pbis} = \frac{M_p - M_t}{SD_t}\sqrt{\frac{p}{q}}$$

Note:

r_{pbis} : Validity test

M_p : The average score of students who answered the item correctly

M_t : The average score of the total score

SD_t : The standard deviation of the total score

p   : The proportion of students answered correctly

q   : Proportion of students answered incorrectly

rtabel (5% significant level and dk = n) with the requirement:

If $r_{count} > r_{table}$ then the the test items are Valid.

If $r_{count} < r_{table}$ then the the test items are Invalid.

The reliability test aims to measure trustworthiness, and consistency of the tests in measuring data. According to Sudijono (2012: 216) the reliability test can use the following formula:

$$r_{ii} = \left(\frac{n}{n-1}\right)\left(\frac{SD_t^2 - \sum pq}{SD_t^2}\right)$$

Note:

r_{ii} : Reliability test

n   : Number of test items

SD_t^2 : Total Variance

p   : The proportion of the students who get a score 1

q   : Proportion of the students who get score 0

With the criterion:

If $0{,}00 \leq r_{ii} \leq 0{,}69$ then the test is not reliable and the problem device is replaced.

If $0{,}70 \leq r_{ii} \leq 1{,}00$ then the test is reliable.

Difficulty Test

The difficulty test aims to capture the subjects who answer the test items correctly. According to Robert L. Thorndike (in Sudijono, 2012: 372) the difficulty level tests uses the formula:

$$P_n = \frac{B_n}{J_s}$$

P_n : Difficulty level of item to-n

B_n : Number of students who answer correctly for item to-n

J_S : Total number of the students

With the criterion:

$0,00 < P < 0,30$: Difficult

$0,30 < P < 0,70$: Medium

$0,70 < P < 1,00$: easy

Different power test separates the clever students and the less clever students to know the level of goodness of each item question. Sudijono (2012: 390) suggests the different test power formula and criteria as follows:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B}$$

Note:

D : Different power

B_A : The number of upper group who answer the test correctly

B_B : The number of students in the lower group who answer the test correctly

J_A : Number of upper group students

J_B : Number of lower group students

With the criterion:

$0.00 < D < 0.20$: Bad

$0.21 < D < 0.40$: Enough

$0.41 < D < 0.70$: Good

$0.71 < D < 1.00$: Very good

Analysis of Validation Data of the Students Worksheet (LKS)

The technique used to analyze the validation result of the Student Worksheet (LKS) is qualitative descriptive, that is by looking at the feasibility assessment of the Student Worksheet (LKS) from the research result. The quality of eligibility for the development of the developed Student Worksheet (LKS) is viewed from the assessment of the expert team's validator to the developed Student Worksheet (LKS). The material expert's validator, linguist, and design learning expert will answer the question by checking the list ($\sqrt{}$) on a scale of 1-4. The criteria of the instrument validation answer of the Student Worksheet (LKS) can be seen in Table 4 below:

Table 4: Criteria of the Item Answers of Validation Instrument

No	Answer	Score
1	Very Good	4
2	Good	3
3	Less Good	2
4	Not Good	1

Then the data is analyzed by calculating the percentage score of the developed Student Worksheet (LKS). The formula used to calculate the percentage of the validation sheet of the Student Worksheet (LKS) is as follows:

$$P = \frac{f}{N} x 100\%$$ (Sugiono, 2013)

Note:

P = Score Percentage

f = Number of scores obtained

N = Maximum number of scores

According to Sudjana (2007: 91) the determination of validation criteria is determined in the following ways:

a. Determining ideal percentage score (maximum score), that is:

$$\left(\frac{4}{4}\right) x 100\% = 100\%$$

b. Determining the percentage of ideal score (minimum score), namely:

$$\left(\frac{1}{4}\right) x 100\% = 25\%$$

c. Determining the range, i.e 100% - 25% = 75%

d. Specifying the interval class, ie 4 (very valid, valid, less valid, and invalid).

e. Determining the length of the interval, ie 75: 4 = 18.75%

Based on the above calculation, the percentage range and qualitative criteria of feasibility test are presented in Table 5 below:

Table 5: Percentage Range and Qualification Criteria LKS Feasibility Test

Achievement Level	Qualification
$81,26\% < P \le 100\%$	Very Valid
$62,26\% < P \le 81,25\%$	Valid
$43,76\% < P \le 62,25\%$	Less Valid
$25\% < P \le 43,75\%$	Invalid

The analysis of the effectiveness of the LKS aims to take a decision on whether to do further testing in the development phase of the Student Worksheet (LKS). The effectiveness of the Student Worksheet (LKS) used in learning is determined based on the achievement of indicators in the form of: (1) the success of learning or mastery of the student learning; (2) the achievement of learning indicators; (3) the student response; and (4) the percentage of study time. The effectiveness of the use of Project-Based Student Worksheet (LKS) is achieved if it meets at least three (3) of the four (4) indicators, provided that the learning achievement or completion of the students' learning is complete.

1) Analysis of the Students Learning Completeness

The test results obtained are then analyzed by the researcher to see the mastery of the students in individual and classical learning.

(a) Calculating the Individuals Learning Completeness

Student's individual learning mastery can be calculated by the formula:

$$KB = \frac{T}{T_t} \text{ x } 100 \text{ %} \qquad\qquad \text{Trianto, (2009:241)}$$

Where:

KB   = Learning mastery

T   = Number of scores obtained by the students

T_t = Total score

With the criteria:

0% = KB <65% of students who have not finished the study

65% = KB = 100% of students who have completed the study

Each student is said to be completed the learning (individual completeness) if the proportion of the students correct answers = 65%.

(b) Calculating the Classical Learning Completeness

To know the students learning completeness by classical used the formula:

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$$PKK = \frac{\text{Number of KB student} \geq 65\%}{\text{Number of research subject}} \times 100\% \text{ (Depdikbud in Trianto, 2009)}$$

Note:

PKK = percentage of classical completeness

According to Depdikbud (in Trianto, 2009) a class is said to be thoroughly studied if in the class has 85% who have achieved = 65% KB. After the students' individual and classical learning completeness are analyzed, the results of pre-test and post-test are calculated with gain score. To assess the increase and the effectiveness of the Student Worksheet (LKS) on the material of *The Nature of Lights and their Usage* between before and after using the Students Worksheet (LKS) in the learning process is calculated by a normalized gain score formula:

(Post-assessment - Pre-assessment)

(100% - *Pre-assessment)*

Gain score is a good indicator to show the effectiveness level of the treatment from the acquisition of post-test score (Hake, 1999). The gain score categories are grouped as follows:

$0.70 < gs < 1.00$ = high

$0.30 < gs < 0.70$ = moderate

$0.00 < g < 0.30$ = low

2) Achievement Analysis of the Learning Indicator

The indicator achievement is obtained if at least 75% of the formulated indicators can be achieved by 65% of the students (Dikdasman in Hasratuddin, 2002). To calculate the achievement of indicators in learning used the formula:

$$T = \frac{S_i}{S_{maks}} \times 100\% \qquad \text{(Dikdasman in Hasratuddin, 2002)}$$

Note:

T = percentage of the indicator achievement

S_i = total of the students' score for item 1

S_{maks} = maximum number of scores for item 1

With the criterion:

$0\% = T < 65\%$ TPK is not yet reached

$65\% = T < 100\%$ of TPK is achieved

3) Analysis of the Students' Response Questionnaire

The data obtained from the questionnaire of the students' responses is analyzed by determining the percentage of the students who gave a positive response answer for each category questioned in the questionnaire by using the following formula:

$$PRS = \frac{\sum A}{\sum B} \times 100\,\%$$ (Borich in Herman, 2012)

Information:

PRS : The percentage of the students number who respond positively to each of the categories asked

$\sum A$: The proportion of students who choose

$\sum B$ :: Number of the students (respondents)

To determine the achievement of learning objectives in terms of the student responses, if the number of the students who responded positively greater or equal to 80% of the subjects number studied for each trial (Sinaga, 2007).

DISCUSSION

This research is a developmental research that produces a product of the Students Worksheet (LKS). The development which is carried out in this research is a Student Worksheet (LKS) for fourth grade students of SD (Primary School). The main objective of this study is to describe the development result of the project-based Student Worksheet (LKS) on the material *Understanding the Government and the Governmental Components in Indonesia.* In addition, it also describes the students' learning outcomes, and responses to the Student Worksheet (LKS).

The developed learning media is declared feasible to use if the media is valid, practical, and effective. It is said valid if it has been validated by a material expert, validation of media experts and illustration language expert. Learning media is said to be practical if the questionnaire of the students' responses and the questionnaire of media practicability which assessed by the teachers reached a percentage of 80%. Then the developed learning media is said to be effective if the classification of the learning outcomes belongs to high category:

1) Data of Validation Result from the Learning Design Expert

The validation of learning design on the developed LKS is conducted by 1 expert, Dr. Baharuddin, St, M.Pd who is a lecturer at the Faculty of Engineering UNIMED. The result of LKS validation in the form of assessment score on the learning design aspects such as on the feasibility of presentation, presentation, linguistic, and picture selection. According to the LKS quality of learning design expert who developed has been *valid*. The validation of the components on the quality of LKS learning design can be seen in Table 6 below:

Table 6: Results of LKS Validation by the Learning Design Expert

Assessment Aspect	Assessment Indicator	Assessment Grid	Validator Score	Presentation Score	Criteria
Feasibility of Presentation	Presentation Techniques	1. Consistency of systematic presentation in learning activities	3	75 %	Valid
		2. Order of concept	3	75 %	Valid
	Supporting Presentation	3. Examples of problems in learning activities	3	75 %	Valid
		4. Problem training at the end of learning	3	75 %	Valid
		5. The accuracy of image selection	3	75 %	Valid
		6. The accuracy of color selection in the picture	2	50 %	Kurang valid
		7. The accuracy of story selection	3	75 %	Valid
		8. Introduction	3	75 %	Valid
Presentation	Presentation of Learning	9. Student involvement in learning activities	4	100 %	Sangat valid
		10. Encourage students to answer in their own way	4	100 %	Sangat valid
Language	Coherence and Mindset Thinking	11. The linkage between learning activities	3	75 %	Valid
		12. Time of Presentation	3	75 %	Valid
		13. Ease of understanding the language	3	75 %	Valid
Picture Selection	Display Quality of LKS	14. Display	3	75 %	Valid
		15. Illustration	3	75 %	Valid

The conclusion of learning design validator to the developed LKS is feasible to be used in field without revision. However, there are suggestions to improve the quality of the developed LKS. The criticism and suggestions from the design expert validator for LKS revision can be seen in Table 7 below:

Table 7: Revised LKS from Validator Learning Design Expert

Validator	Mistakes	Suggested Revision
Dr. Baharuddin,St, M.Pd	There are some pictures on the LKS that are less clear.	Adjust the use of writing with pictures, symbols, on the student worksheet

2) Data of validation results of learning design expert

The learning design validation on the developed students worksheet (LKS) shows that: 1) the quality of learning design of the Student worksheet (LKS) seen from the feasibility of presentation is considered *very valid*, with 71,86%, 2) the quality of learning design of the Student worksheet (LKS) seen from the presentation is considered *valid*, with 100%, 3) the quality of the learning design of the Student worksheet (LKS) seen from the language is considered *very valid*, with 75% and 4) the quality of the learning design of the Student worksheet of the picture selection is considered to be *very valid*, with 75%. The percentage of assessment results by the design expert of learning can be seen in Table 8 the following:

Table 8: Average Percentage of Assessment Result by Learning Design Expert

Assessment Aspect	Score Percentage	Average Percentage	Criteria
Feasibility of presentation	75 %	71,86 %	Valid
	75 %		
	75 %		
	75 %		
	75 %		
	50 %		
	75 %		
	75 %		
Presentation	100 %	100 %	Very valid
	100 %		
Language	75 %	75 %	Valid
	75 %		
	75 %		
Picture selection	75 %	75 %	Valid
	75 %		
Average		80,47 %	Valid

Based on the analysis of the data, it can be concluded that the average percentage of the assessment results of the learning design Student Worksheet (LKS) is categorized as *valid* with an average score of 80.47%. The percentage diagram of the results of the assessment of design expert learning can be seen in Figure 1 below:

Figure 1

Chart of Average Percentage of Assessment Result by Learning Design Expert
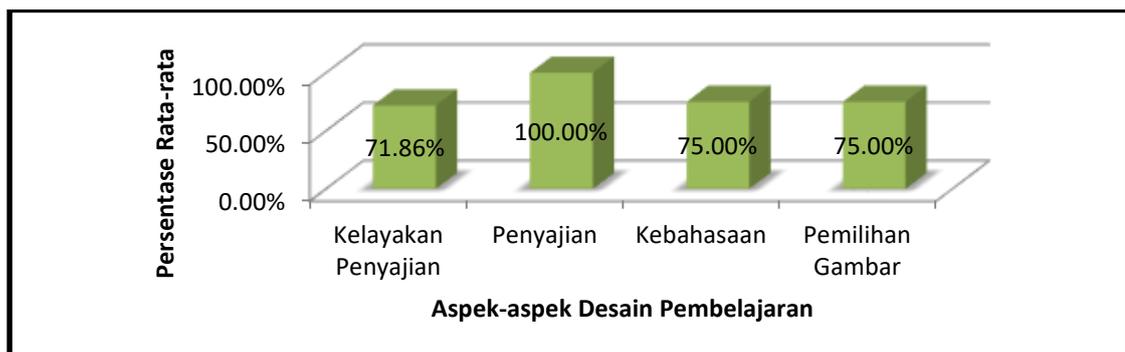
Based on the assessment result on thy learning design, there are some that need to be revised, they are clear the picture on the LKS. After being revised, the learning design expert stated that the developed Students Worksheet (LKS) is feasible to be used in the field without revision and valid.

CONCLUSION

The results of the material validator conclusions in each aspect of the overall assessment can be stated that the Project-based Student Worksheet (LKS) is feasible to be used in the field without revision and is valid, then the language validator in each aspect of the overall assessment may be stated that the Project-based Student Worksheet (LKS) is feasible to use in the field with revisions and is *very valid*. While the conclusions of the design learning validator on each aspect of the overall assessment can be stated that the Project-based Student Worksheet (LKS) is feasible to be used in the field without revision and is *valid*.

The effectiveness of project-based LKS is obtained through a one-time trial. In the field trial obtained the percentage result of classical completeness increases, the achievement of learning objectives is achieved; positive student response; and the percentage of effective learning time. Based on the gain score, the effectiveness of the Project-Based Student Worksheet (LKS) in improving learning outcomes is *moderate*. In the field trials the terms of effectiveness are met, and it can be concluded that the developed Students Worksheet (LKS) based on the project has been effectively used. From the results of the validating stages and the field trials which apply the project-based learning model using Project-based Student Worksheet (LKS) can be concluded that the developed project-based Student Worksheet (LKS) can improve students' learning outcomes.

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