Practicality Assessment of Student Worksheets for SMP Physics Learning on the Traditional Culture-Based Equipment

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Abstract. The purpose of this study is to examine the practicality of Student Worksheets (LKS) physics learning at junior high school (SMP) for validated traditional culture-based tools. The topic of the LKS is simple machine. The method used in the study is a research and development. The research was conducted at the Junior High School in Pekanbaru which the data source was from three science teachers and thirty students of class VIII. The LKS practicalities data was obtained through questionnaires practicalities of the device which was given to teachers and students. The analysis of the data used descriptive analysis that is to categorize the average score on learning process. Based on the analysis of the data, the practicality of the LKS has an average with the excellent category for all aspects. This shows the LKS of physics learning at junior high school based on the traditional culture equipment on the topic of simple machine practical can be used as a medium of learning physics at junior high school.

Keywords: *Practicalities, Student Worksheet, Simple Machine.*

1 Introduction

In a formal education, the learning process shows a positive change so that in the final stages will be acquired a new skills and knowledge. Learning is a process by which a person undertakes to obtain a new change, as a result of his own experience in interaction with his environment (Sobry Sutikno, 2013). The existence of "change" is the result of learning. Meanwhile, learning is an effort made by teachers (educators) in order to allow student in the learning process. In learning there is activity of choosing, establishing, and developing methods to achieve desired learning outcomes. Teachings emphasize on ways to achieve goals related on how to organize the subject matter, deliver the lesson material, and manage the lesson.

In the process of learning and in order to deliver the material with more effective, a teacher must make learning tools, one of the learning tools is the Student Worksheet (LKS). Student Worksheet (LKS) is a student manual

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used to conduct investigation or problem solving activities. The student worksheet can be a guide for cognitive aspect development, exercises, as well as guides for developing all aspects of learning in the form of experimental or demonstration guides. LKS contains a set of basic activities that must be done by students to maximize the understanding in the effort of forming basic capabilities in accordance with indicators of achievement of learning outcomes that must be pursued (Trianto, 2010).

The learning process needs teaching materials as one of the important components that help students achieve the learning objectives. Based on the results of the interviews and observation of teaching materials used so far, the student worksheets (LKS) that is used along this time is obtained from the publisher. The student worksheets by the publisher is already containing a complete material, but the activities presented are less able to facilitate the role of the student in learning to discover and understand the concept of the material through the activities guidance in the worksheet.

Teachers who choose to use LKS in learning need to pay attention for many things. Selection of LKS must be in accordance with the function and purpose of preparation and making of LKS. Prastowo (2013) stated that the function of the preparation and the use of LKS in general learning is as teaching materials that make it easier for learners to understand the given material as a compact and rich teaching materials to practice and facilitate the implementation of teaching to educate participants.

Prastowo (2013) mentioned the purpose of LKS for learning to present teaching materials that enable learners to interact with the given material, presents tasks to improve students 'mastery of the provided material, training learners' independence and make it easier for educators to assign tasks to educate participants.

LKS currently occupies an important position in terms of learning, especially after the growing popularity of student centered learning. Student centered learning emphasizes to the student activity. Students are freed to move in accordance with predetermined pathways. The smoothness of these activities requires LKS as a study guide.

The use of LKS in the learning activities can encourage students to process the learned material, either individually or together with their friends in the form of group discussion. LKS can also provide full opportunities for students to express their skills in developing the thinking process through searching, guessing and even reasoning (Suhadi, 2007). LKS is a form of teacher's effort to guide students in a structured manner, where the activities provide the students with an attraction to study physics. As is commonly known, the responsibilities of teachers are not only as an information provider, but furthermore as a driver of learning so that students can construct their own knowledge through various activities in learning

activities. In its capacity as an educator, teachers are expected to provide an attractive learning model alternative and can support the growth of student-centered learning activities (Depdiknas, 2008).

The development of LKS with a contextual approach can awaken learners that what they learn is very useful in their real life so that they will locate themselves in the need of supplies to solve various problems in the real life.

Istiqomah, Lailatul (2009) mentioned that the contextual learning is a learning concept that helps teachers connect learning materials with real-world situations, and encourages students to make connections between their knowledge and application in their daily lives. The context-based approach aims to develop and maintain a sense of leaner curiosity for the natural world, a contextually based approach aimed at developing and maintaining a sense of awe and curiosity about nature (Eser & Neslihan, 2014). At the same time, the context may help learners to connect scientific knowledge with real life (Laguador, 2014). Students are required to encourage meaning by using context, thereby justifying the "need-to-know" approach of content (Yigit, 2010). Thus, the students' positive interests and attitudes toward physics can be increased (Eser ÜLTAY, 2014).

The LKS with contextual approach in this research is LKS which is developed with traditional culture orientation that is related to real life. The context of the problem that is raised should be in accordance with the concept of the material being studied. The intended context is the situation or event that corresponds to the concept being studied. LKS development with contextual approach is expected to make learners will be more interested and motivated to learn mechanical techniques because they feel close to the concept of physics in its application in real life.

Based-cultural Learning is a strategy for creating learning environments and designing learning experiences that integrate culture as part of the learning process. (Dirjen Dikti, 2004). Based-cultural learning is founded on the recognition of culture as a fundamental part of the education, expression and communication of ideas, and the development of knowledge. Of course, learning by using culture as the embodiment of the media is very memorable to make students understand the lesson (Jasni and Zulikha, 2013). Learning through culture is a strategy that gives students an opportunity to demonstrate the attainment of understanding or meaning that creates in a subject through a variety of cultural manifestations. Learning through culture is one form of multiple representation of learning (Dirjen Dikti, 2004), or a form of understanding assessment in various forms. Learning with culture involves the use of different forms of cultural manifestation. According to Adhitama et al (2015) in learning with culture, culture and its manifestation into learning are as a media in the learning process. It becomes the context of examples from concepts or principles in a

subject, and becomes the context of application of principles or procedures in a subject.

2. Methodology

This research was conducted at Junior High School in Pekanbaru, the lesson year 2015/2016. The study was conducted from July to November 2015. The type of research was Research and Development. The R & D research was used to produce certain products or refine existing ones (Sugiyono, 2014). Based on the development of R & D, researchers performed the following procedure as given in Figure 1.

The object of this research was the development of LKS based on traditional culture. LKS device developed in this research consists of five components on Simple Mechine material that are LKS type 1 lever material with rice pest culture medium, LKS type 2 lever with culture media of coconut milking tool, LKS type 3 lever with medium of culture tool of bird dispersal, LKS sloped field with stake culture media and pulley, as in figure 2

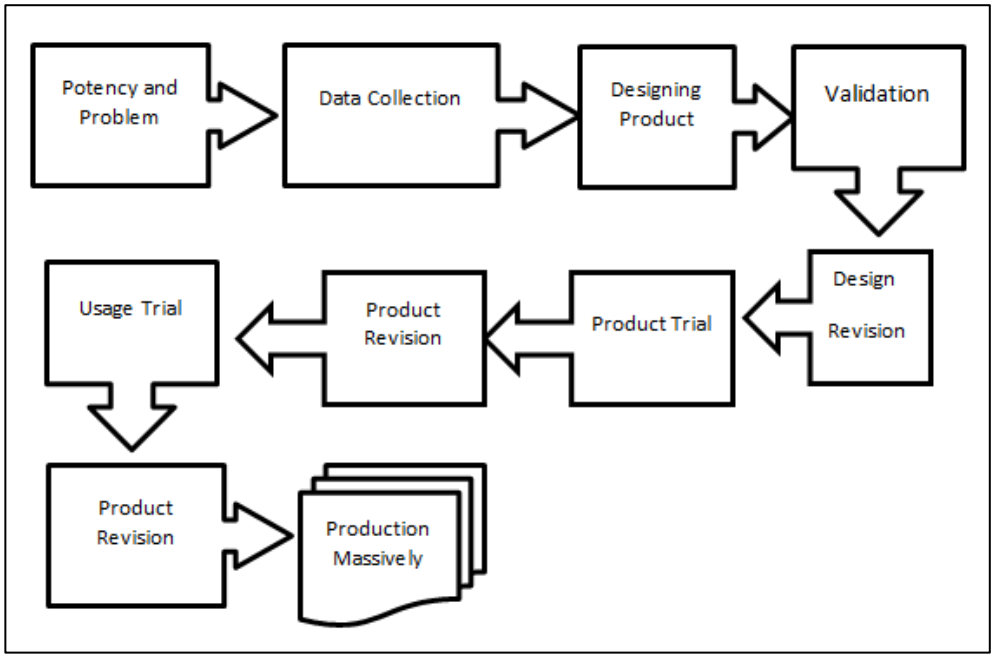
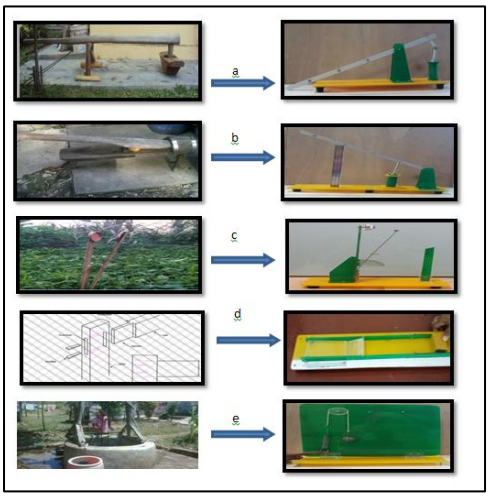


Figure 1. The flowchart of the research



A. Pounder of rice (lever type 1)
B. Coconut milkers (type 2 levers)
C. Bird's prey (lever type 3)
D. Stakes (incline)
E. Pulley

Figure 2. The media discussed in LKS

The research instrument developed in this study is a validated questionnaire of experimental instrument using Likert scale. This instrument is a data collection instrument including:

The validity of a research instrument is the degree that indicates where a test measures what it wants to measure, a measured thing should be valid not universal. Assessment of the experimental apparatus includes, functionality, size, construction, ease of use, safety, appropriateness as experimental tools, economic, educating and psychology value, aesthetics and cultural value, whereas tool practicality includes preparing experiments, timing efficiency, efficiency teaching concept, introduction of practical components, ease of use, packaging of experimental devices.

The data collecting technique was conducted using primary source with two instrument tools namely instrument of learning media validity that was conducted by 3 physics education experts at University of Riau and 2 physics teachers, and instrument of learning media practicality by 3 teachers and 30 students of SMP class VII after Experiment.

The data analysis technique used in this research was a descriptive analysis which includes describing the results of research in the form of mean, standard deviation, and the distance between the lowest and highest value (Creswell, 2010).

The data analysis is using the following procedures:

1. Summing up each questionnaire indicator of practicality. The category of questionnaire assessment uses guidelines as shown in Table 1.

Table 1. Category Assessment Questionnaire

No	Category	Score
1	Mostly Agree	4
2	Agree	3
3	Less Agree	2
4	Not Agree	1

(Sugiono,2014)

2. Finding the average of each practicality questionnaire indicator
3. Averaging the overall practicality questionnaire.
4. Determine the average category of each indicators based on the Likert scale (Table 2).

Table 2. Practicality Category

No	Category	Range
1	Very High	$3{,}25 \leq \bar{x} < 4{,}0$
2	High	$2{,}50 \leq \bar{x} < 3{,}25$
3	Low	$1{,}75 \leq \bar{x} < 2{,}50$
4	Very Low	$1{,}00 \leq \bar{x} < 1{,}75$

3. Results and Discussion

The test result of the practicality of the student worksheet for the simple machine experiments, consisting of five pieces of experimental student worksheet, which are the student worksheet for the rice pounding experiment, the coconut milk extraction, the bird dispersal, the incline and the pulley obtained from the junior high school teacher can be seen in Table 3

Table 3. The teacher questioner result for practicality of student worksheet

Assessed	Rice		Coconut		Bird		Incline		Pulley	
	$\bar{x}$	Ket	$\bar{x}$	ket	$\bar{x}$	ket	$\bar{x}$	ket	$\bar{x}$	Ket
1	3.67	ST	4.00	ST	4.00	ST	4.00	ST	4,00	ST
2	3.67	ST	4.00	ST	4.00	ST	4.00	ST	3,67	ST
3	3.67	ST	4.00	ST	3.67	ST	4.00	ST	4,00	ST
4	3.67	ST	3,67	ST	3.67	ST	4.00	ST	3.67	ST
5	4.00	ST	3,67	ST	3.67	ST	4.00	ST	3.67	ST
6	4,00	ST	4.00	ST	3.67	ST	4.00	ST	3,67	ST
7	4,00	ST	4.00	ST	3,33	ST	4.00	ST	3,33	ST
8	3.67	ST	3,67	ST	3,67	ST	3,67	ST	3,67	ST
	3.75	ST	3,88	ST	3,71	ST	3,96	ST	3,71	ST

Description of assessed aspects:
1. The goal of the experiment is easy to understand
2. The experiment steps are easy to understand and to follow
3. Trial steps make it easier for students to understand the concept
4. The use of images helps clarify experimental activities
5. The observation table makes it easier for students to record data
6. Students become more active in simple machine learning
7. The trial time becomes shorter
8. Students are more confident in the truth or conclusions based on their own experiments

Based on Table 3, it is known that each assessed aspect by 3 respondents show the value of practicality with very high category in all assessed aspects. This value category indicates that the student worksheet for a simple machine experiment is practically used by the teacher as a medium of learning simple machine topic.

The test result of the practicality of the student worksheet for the simple machine experiments, consisting of five pieces of experimental student worksheet, which are the student worksheet for the rice pounding experiment, the coconut milk extraction, the bird dispersal, the incline and the pulley obtained from the junior high school student can be seen in Table 4.

Based on Table 4, it is known that each aspect assessed by 30 respondents produce the practicality value with very high category in all assessed aspects. This indicates that the student worksheet can be practiced as a medium of learning for a simple machine experiment tools.

Table 4. The student questioner result for practicality of student worksheet

Assessed	Rice		Coconut		Bird		Incline		Pulley	
	$\bar{x}$	ket	$\bar{x}$	ket	$\bar{x}$	ket	$\bar{x}$	Ke	$\bar{x}$	ket
1	3,50	ST	3,50	ST	3,58	ST	3,61	ST	3,58	ST
2	3,39	ST	3,33	ST	3,39	ST	3,33	ST	3,33	ST
3	3,17	T	3,30	ST	3,30	ST	3,22	T	3,28	ST
4	3,28	ST	3,53	ST	3,44	ST	3,61	ST	3,64	ST
5	3,42	ST	3,47	ST	3,33	ST	3,44	ST	3,36	ST
6	3,30	ST	3,42	ST	3,39	ST	3,39	ST	3,44	ST
7	3,33	ST	3,47	ST	3,42	ST	3,36	ST	3,39	ST
8	3,33	ST	3,56	ST	3,50	ST	3,50	ST	3,53	ST
	3,34	ST	3,45	ST	3,42	ST	3,43	ST	3,44	ST

Description of assessed aspects:
1. The goal of the experiment is easy to understand
2. The experiment steps are easy to understand and to follow
3. Trial steps make it easier for students to understand the concept
4. The use of images helps clarify experimental activities
5. The observation table makes it easier for students to record data
6. Students become more active in simple machine learning
7. The trial time becomes shorter
8. Students are more confident in the truth or conclusions based on their own experiments

Suharsimi Arikunto (2012) said that practiced learning media should be equipped with clear guidance instructions. The student worksheet is a guide in using a simple machine experimental tool. Based on the average scores of assessed aspects in the practicalities of the simple machine experiment of student worksheet given by the respondents which is consisting of 3 science teachers and 36 students, the scores were high and very high category. With these categories, the student worksheets can allow teachers and students to carry out simple machine experiments.

Jamaluddin et al (2013) revealed that one of the reasons why the physics experiment is rarely done lab in school is caused due to the teacher has a difficulty in making a student worksheets. So, using these practiced student worksheet, this can facilitate the work of teachers. The student worksheet makes it easy for students to do experiment easily due to the experimental procedure in the student worksheet are easy to follow. The figures in the student worksheets also help in clarifying the experimental procedures that must be performed by the students. This student worksheet is practice used by students due to the language used is easy to understand by students. All in the student worksheet are able to guide students to achieve the purpose of performed experiments.

Student worksheets provide opportunities for students to do the experiment independently. It means, students believe in the results obtained through the performed experiments. Students did experiment more creative and active.

The tables in the student worksheet make students to record experimental results easily allow students to create a graph. The graph makes it easier for students to find the relationship between the quantities obtained in the experiment. It leads the students to understand the concept of simple machine concept. In addition, it is also able to direct students in drawing conclusions from the experiment.

4. Conclusion

Based on data that has been collected and data analysis in the discussion that has been described, it can be concluded that the student worksheet that is practice used as an experimental tool with the practicality score very high in category for all aspects of the assessment. The student worksheet for simple machine material that has been tested its practicality definitely can be used as student worksheet for junior high school of physics learning.

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