

# Student Learning Outcomes and Learning Evaluation in the Implementation of Physics Worksheet Based on Technological Excellence and Added with Islamic Values: Case Study for Male Students (Santri Putra)

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**Abstract—** Research has been carried out to study the student learning outcomes and learning evaluation in the implementation of student worksheets (LKS) based on technological excellence and imbued with Islamic values for grade X high school male students. This research used a pretest-posttest control group design (learning outcomes) and observation (learning process). The research subjects were male students of one school in the Bantul area with 37 class X students as control and 37 experimental class students. Physics learning using worksheets in male students has a positive impact. Students actively ask and take the initiative in using LKS. The use of software runs well and students can follow step by step with confidence and want to try it. Learning strategies must be adapted to the conditions of students in the learning process. The results of the pre-test and post-test test in the experimental class were 15.06 and 30.96 respectively where there was an increase in the gain score of 0.18 in the low category. The results of the analysis of the pre-test and post-test tests in the control class in the male student class were 14.69 and 29.92 respectively where there was again in the score of 0.19 in the low category. Based on the Wilcoxon test results obtained a significance level of 0.000 so that the hypothesis is accepted and the LKS influences the increase in student learning outcomes. In order to increase the result of the Implementation of the LKS, it can be done research in other schools that has a male and female student in one class.

**Keywords—** *learning outcomes, learning evaluation, Worksheets (LKS) implementation*

## I. INTRODUCTION

Student worksheets (LKS) are sheets of work that must be done by students that have a function to attract students to be actively involved in the material being discussed [1]. Student worksheets are sheets containing assignments that must be done by students. Activity sheets are usually in the form of instructions, steps to complete a task. A task ordered in the activity sheet must be clearly related to basic competencies that will be achieved [2]. Student worksheets are sheets containing tasks that must be done by students. The student activity sheet will contain at least; title, student competencies to be achieved, completion time, equipment/materials needed to complete the task, brief information, work steps, tasks to be done, and reports to be done [3]. LKS is a written teaching material that fit with individual activities that must be carried out by students while studying the topic and allows students to be responsible for their own learning with processes related to their activities [4][5]. LKS are sheets containing assignments done by students. This worksheet contains instructions and steps to complete a task given by the teacher to his students [6]. In the learning process, students' worksheet is used as tools of a lesson to direct students to deepen the subject material [7].

Worksheet or LKS can be used to teach using various methods. LKS can be used to develop students character [8]. Nugraha et al develop worksheet to increase the science process skills of students in basic physics experiment [9]. LKS is flexible to make and to add with many kinds of learning materials and built in many purposes for the student. New technology in teaching physics and Islamic values can be added to the LKS of the student. Newest technology can be applied in the

experiment in LKS. Islamic values can be added in every learning material in the LKS.

Teaching materials used by teachers at school now contain subject matter. Student worksheets (LKS) as one of the teaching materials for students need to be further developed to instill Islamic values and use the latest learning technology. Student worksheets which add Islamic values and using the latest technology have been developed by Eko et al [10]. The result is an initial draft that is ready to be implemented in the field. The results of the study from expert tests are at a good level of feasibility. Draft LKS that has been declared feasible by experts is ready to be implemented in the field but not have been implemented yet.

The learning technology used in the LKS developed by Eko et al [10] uses Physical Education Technology (PhET), Loggerpro, Audacity, and a variety of the latest software in the physics learning process. There are 4 integration models of the Al Qur'an in the curriculum, namely: contribution model (contribution model), additive model (additive model), transformation model (model transformation) and decision-making or social action model (decision maker or social action model) [11]. According to Mas'ud [12], the effort to Islamize science can be done by wrapping science from the western world with the label of Islam or transforming religious norms based on the Qur'an and Hadith according to empirical data (in real life). Integration of Islamic values in physics learning at UAD uses 3 things:

1. Reviewing the verses of the Al Qur'an and or Hadith at the beginning of the learning process and directed to get a relationship with the physical concepts that exist in nature
2. Review the concepts of physics in nature at the beginning of the learning process and connect with the verses of the Al Qur'an and or Hadith
3. Reviewing the concepts of physics in nature to admire, be grateful for, and acknowledge the greatness of Allah SWT.

Friska and Nyoto [13] state that LKS can be filled with steps that guide students in understanding science through various offerings and steps in accordance with the objectives to be achieved, including verse quotations from the contents of the Qur'an to be associated with material offerings, which is easy for students to learn. Sri [14] said that Physics subject matter could prove the truth of the Koran so that it can enhance students' sense of faith and piety. The material is related to the verses of the Holy Koran and the values of the verses of the Holy Koran, supporting information (in this section information will be provided that can support understanding the material of Physics and the faith of students.

The initial draft LKS that has been made by Eko et al, has been declared feasible by experts and is ready to be implemented. The purpose of this study is to determine the improvement of student learning outcomes after using that LKS with the latest technology and imbued with Islamic values and evaluating learning process using the LKS in the male student class/ Santri putra. This study is never

done before for only male student class and the effect of the LKS is never done before.

## II. RESEARCH METHOD

To see an increase in student learning outcomes in this study determined based on the results of the pre-test and post-test, namely the value of the student's score gain. With the normalized gain equation as follows:

$$g = \frac{sf - si}{100 - si} \dots\dots\dots [15]$$

Information:

- $g$  = gain
- $sf$  = post-test
- $si$  = pre-test

Test decision:

- a.  $g$  is categorized as high if  $g > 0.7$
- b.  $g$  is categorized as moderate if  $0.7 > g > 0.3$
- c.  $g$  is categorized as low if  $g < 0.3$  [16]

The use of this LKS is said to be successful if the gain score is in the medium or high category. This increase can be supported by statistical tests with the following conditions:

- a. Test for normality and homogeneity  
This test is done using *Lavene test or Kolmogorov-Smirnov test*. This test was conducted to determine the type of statistical test that will be used in a comparison between the results of the pre-test and post-test. If the class is homogeneous and normal, parametric statistics are used and if not normal or not homogeneous, nonparametric statistics are used.
- b. Parametric test  
Parametric tests were carried out with *related sample t-test using SPSS* to determine whether there were significant differences between pre-test and post-test with a significance level of 0.05.
- c. Non-parametric test

Parametric tests were carried out with *Wilcoxon Match Pair Test* using SPSS to determine whether there were significant differences between pre-test and post-test with a significance level of 0.05.

## III. RESULTS AND DISCUSSION

### A. Application of LKS in the male Santri class

The results of observations on LKS implementation in the male students/Santri class are as follows:

1. Technology literacy works well
2. Students quickly absorb new technology according to the direction of the teacher
3. Student learning motivation is lacking especially at the time after Dhuhur because sleepy, etc.
4. Student activities after the learning process are reciting and studying at night
5. Many students memorize the Koran and sometimes in the learning process

6. Conditioning of students takes approximately 10 minutes
7. Focus on student learning is low if the teacher only delivers the material as usual
8. The best learning is concise material followed by problem-solving training and students work ahead
9. Homework is not effective because it will only copy the answers from their friends
10. LKS works well, learning material is concise, solid, clear, and about enough
11. At the time of the exam, some students have not studied

Male students have distinctive and interesting characteristics. Students quickly adapt to the new software they are facing and use when they are practicing. Male students are easily directed to carry out lab work using Loggerpro. Students at their first meeting, smoothly and not many questions to the teacher were able to follow all directions in doing the tracking. Students are able to understand the meaning of tracker chart results compared to the graph on LKS.

Student learning motivation is influenced by the position of class hour, night activities, and teacher teaching methods. The lesson hours after the Duhur (after 1 pm) is a challenge because students are sleepy. If Activities at night too much it will make students also sleepy and lazy to learn. Teachers who teach using the only one lecture method without heeding students' moods and good class management will not be able to deliver the material well to students. It takes time for the initial conditioning of students to focus on learning.

In general, worksheets function well. The material is concise, solid, clear, enough questions, and students are able to follow it. In the process, students prefer to do training to solve problems. Further explanation is very much asked in the process of training to solve problems. The best strategy is to provide material briefly, densely and clearly then followed by intensive practice before the test. This, cannot be seen in the learning process with worksheets so that learning is less effective. The results are many students do not understand the material, there are not many practice questions, and the post-test results are below the expected completeness criteria. The pre-test and post-test questions used also seemed too difficult so the results were also not good.

The learning process is carried out in 6 lesson hours of study. One lesson hour is used for the pre-test, 4 lesson hours are used for the learning process and two times practicum, and 1 lesson hour later is used for post-test. This process is carried out in the experimental class. In the control class, an ordinary learning process is carried out using the standard physics book reference used by the school. The result of the experimental class pre-test shows a mean value of 15.06 while the post-test result shows a mean value of 30.96. This result is far below the expected standard. In the control class, the mean value of pre-test 14.69 and post-test shows a mean value of 29.9.

The results of the pre-test and post-test show that learning with LKS can increase students' cognitive learning outcomes even though it is still below the

expected standard. Because of this, the learning process continues to remedial process. Students get remedies in 2 lesson hours of study. One lesson to repeat the material and 1 lesson for remedial tests. Remedial questions are made with a lower level of difficulty than the post-test problem because there is a possibility that the problem has a high level of difficulty. The results of the remedial test show a fairly high score of 68.9 in the experimental class and 67.9 in the control class. The conclusion of this process is that the right learning method is needed to use the test worksheet. In this case, the best learning method is by drill and practice interspersed with practicum when students do not focus on learning due to the time and circumstances of the students.

Test worksheets can improve student learning outcomes similar to learning books used in school. The learning process requires a particular method tailored to the circumstances of the students in the school. In this case, the school will be more effective with the drill and practice method interspersed with practicum. Practicum can be an alternative learning process if students start to be less motivated. Remediation is needed in this learning process because the chapters presented, namely rectilinear motion, are difficult to understand in a short time (4 lesson hours of study) for students of research subjects.

*B. Increased Understanding of Concepts and Islamic Values*

Students understanding concepts and Islamic values are stated in Table 1.

TABLE I. RESULTS OF INCREASED UNDERSTANDING OF CONCEPTS AND ISLAMIC VALUES

Class	Mean Pre-test	Mean Post-Test	Gain	Category
<i>MIA 2 (Control Class)</i>	14,69	29,92	0,18	Low
<i>MIA 3 (Experiment class)</i>	15,06	30,96	0,19	Low

Students experiences and understanding concept increase in learning outcomes but are still in the low category. This happened because the new LKS was tested for the first time and the software used was also new for teachers and students at the school. It takes longer adaptation and the right learning strategies to improve the learning outcomes of these male students. Islamic values can be started by instilling knowledge that connects physics and with the Qur'an so that faith increases. In a short time, it is difficult to measure and observe the emergence of Islamic values in the Santri / male student.

*C. Effect of LKS on Experimental Classes*

The results of the normality test can be selected in table 2. The significance level obtained from the SPSS test results shows that the data are not normally distributed with Asymp. Sig (2-tailed) at  $0,000 > 0,05$ . While the homogeneity test shows that the mean significance level is  $0,380 > 0,05$  (see table 3). This shows that the data is homogeneous.

TABLE II. ONE-SAMPLE KOLMOGOROV-SMIRNOV TEST

		Kelas_MIA2	Kelas_MIA3
N		37	37
Normal Parameters <sup>a,b</sup>	Mean	29.92	30.96
	Std. Deviation	12,06254	15,19085
Most Extreme Differences	Absolute	,148	,217
	Positive	,110	,217
	Negative	-,148	-,149
Test Statistic		,148	,217
Asymp. Sig. (2-tailed)		,040 <sup>c</sup>	,000 <sup>c</sup>

Because the class is not normally distributed, the influence test (t-test) is conducted in a non-parametric using Wilcoxon. The test results for the experimental class or class that use LKS as teaching material are as follows.

TABLE III. TEST OF HOMOGENEITY OF VARIANCES

		Levene Statistic	df1	df2	Sig.
Kelas_MIA2	Based on Mean	1,127	7	24	,380
	Based on Median	,631	7	24	,726
	Based on Median and with adjusted df	,631	7	16,207	,724
	Based on trimmed mean	1,062	7	24	,417

The hypothesis of this test is:

Ho: LKS does not affect the understanding of concepts and Islamic values of students

H1: LKS influences students' understanding of concepts and Islamic values.

From table 4 above, it is known that sig. (2-tailed) <0.05. This shows that H1 is accepted and Ho is rejected. So, the conclusion is LKS influences the understanding of concepts and Islamic values of students.

TABLE IV. WILCOXON TEST RESULTS IN EXPERIMENT CLASS

Test Statistics	
	Mia_tiga_post - Mia_tiga_pre
Z	-3.227 <sup>b</sup>
Asymp. Sig. (2-tailed)	,001
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

#### IV. CONCLUSION

Based on the results of the learning evaluation and the experimental class experiment and control class, the conclusions are as follows:

1. Physics learning using test worksheets on male students gives a positive impact. Students actively ask and take the initiative in using LKS. The use of software runs well and students can follow step by step with confidence and want to try. Learning strategies must be adapted to the conditions of students in the learning process.
2. The results of the analysis of the pre-test and post-test test in the experimental class in the male class (santri putra) are 15.06 and 30.96 respectively where there is again increase in the score of 0.18 in the low category. The results of the analysis of the pre-test and posttest tests in the control class in the male class were 14.69

and 29.92 respectively where there was again in the score of 0.19 in the low category. Based on the Wilcoxon test results obtained a significance level of 0.000 so that the hypothesis is accepted and the LKS influences the increase in positive.

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