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THE IMPLEMENTATION OF PERFORMANCE ASSESSMENT IN SUB MATERIAL STRING WAVE REFLECTION USING GUIDED INQUIRY LEARNING MODEL TO TRAIN SCIENCE PROCESS SKILLS

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Abstract

This research reported the work on the implementation of performance assessment (PS) in sub material string wave reflection in senior high school using guided inquiry learning model. The aims were to train student's science process skills and to collect the student's response on the learning activities. The examined science process skills are as follows: how the students to formulate an experimental question, to determine the experimental goal, to formulate hypotheses, to determine the experimental variables, to administrate the data and analyzing it and to draw conclusion. The research was designed to be one group pre-test post-test. The teaching learning materials were validated before being used. The student's activities on the class and their science process skills were recorded by video before being evaluated. The research data were analyzed by learning device analysis, implementation learning analysis, pre-test and post-test analysis, interview analysis and student response analysis. The change of students' science process skills were analyzed by t-paired test. The results showed that: (1) the students's science process skills improved. For the example, the students can formulate that experiment questions. (2) The question of "what the difference between the reflected string wave at the tight and the loose strings?", (3) the students responses to the learning activities were also very good. The students felt happy, they were more active, more motivated to learn, braver to express their opinions and they felt that their science process skills were trained.

Keywords: Performance Assessment, Guided Inquiry Learning Model, Science Process Skills, String Wave Reflection

INTRODUCTION

The facts were founded when the Author joined LMP (Learning Management Program) at SMAN 1 Manyar Gresik and the Author was interviewed one of Physics teacher in SMAN 1 Parengan Tuban. The result showed that the teacher still used conventional learning model. Student ability that used learning model was still low given the performance skills rarely trained. Students are accustomed to be taught with a conventional learning model will struggle in experiment activities, especially in formulating the experiment question, to determine the experimental goal, to formulate hypotheses, to determine the experimental variables, to administrate the data and analyzing it and to draw conclusion. So, the student will face difficulties in applying Science Skill Process (SSP). With this fact, the implementation of SSP in learning should be hastened. SSP can be assessed by Performance Assessment (PS) rubric.

This research aims to describe the implementation of PS in sub material string wave reflection using guided inquiry learning model to train science process skills and to collect the students' responses on the learning activities.

METHOD

The research used quantitative-descriptive study with pre-experimental design approach. The research design is one group pre-test post-test design with following design scheme:

O_1	A	O_2

Description: O_1 = Pre-test
A = Learning Activity
O_2 = Post-test

Based on the scheme, before doing learning activities, the students were given pre-test. After that, the learning activity was carried out. The learning activities were recorded by video to detect: (1) guided inquiry phases, (2) the experimental activities, (3) the student can identify which one is crest of string wave, which one is trough of the wave, which one is wave amplitudes, which one is incoming wave and the reflective wave, and also (3) the discussion activities.

The teaching learning materials were validated before being used. The learning activities were evaluated by observation method. The students's responses were got from the interview result and the written questions. Data

was analyzed by implementation learning analysis, pre-test and post-test analysis, interview analysis and student response analysis. The change of students' science process skills were analyzed by t-paired test. Pre-test and post-test was analyzed using *SPSS 16* program.

RESULT AND DISCUSSION

The Learning activity was observed by the local physics teacher. The result is on the table below.

Table 1. Learning Activity Result

No.	Aspect observed	Score	Category	Happen on minutes-
A. Preliminary Activities				
Phase 1: Proposing Problem				
1.	To motivate students.	4	Very Good	01:37
2.	To present learning goals.	4	Very Good	00:41
3.	To describe simple problem relating to learning materials.	3	Good	02:00
Average		**3.67**	*Very Good*	
B. Main Activities				
Phase 2: Create or Present Hypotheses				
4.	To organize students to learn (making group, providing experimental device).	4	Very Good	03:20
5.	To guide the students to formulating hypotheses from formulation problems based on student worksheet.	4	Very Good	06:23
6.	To describe the procedure in learning with guided discovery.	4	Very Good	07:35
Average		***4***	*Very Good*	
Phase 3: Conduct The Experiment to Obtain Information or Data				
7.	To guide the students for experiment activity.	4	Very Good	07:50
8.	Student emphasis about the experiment accuracy.	4	Very Good	08:25
Average		***4***	*Very Good*	
Phase 4: Collecting and Analyzing Data				
9.	To guide the students for collecting experiment data.	4	Very Good	27:51
10.	To give opportunity the students to analyze experiment result.	4	Very Good	29:49
11.	To give opportunity to students to presenting their result.	4	Very Good	55:09
12.	To give opportunity the students to respond.	4	Very Good	56:18
Average		***4***	*Very Good*	
Phase 5: Making Conclusion				
13.	To guide the students for evaluate their learning activities.	3	Good	54:04
14.	To guide the students to draw conclusion.	4	Very Good	01:00:14
Average		***3.5***	*Very Good*	
A. Closing Activities				
15.	Together with students, the teacher reflected the learning.	3	Good	01:09:28
16.	To give opportunity to ask about learning materials.	4	Very Good	01:09:48
Average		***3.5***	*Very Good*	
B. Class Situation				
17.	Students are Enthusiastic.	4	Very Good	00:00-01:10:00
18.	Teacher is Enthusiastic.	4	Very Good	
19.	Time According to Allocation.	3	Good	
20.	Learning Activity accord to Scenario	3	Good	
Average		***3.5***	*Very Good*	

The teaching learning activities was designed to be 3 x 45 minutes. Based on the data on the above table, the preliminary activities gained the scores of 3.67. This score is the average value between 3 aspects in Phase 1. There are aspect 1 (giving motivation), aspect 2 (conveying learning objectives) and aspect 3 (explaining the problem related to the topic). Then, the main activities got score 3.87. All these aspects have been completed well, started from organizing the students to learn until the drawing conclusion. The score was calculated from all aspects in Phase 2, Phase 3, Phase 4 and Phase 5. The guidance provided by the teacher has helped the students to interprete the learning well. The student's achievement was indicated by good presentation of group discussion result. In addition, the students were also able to show which one is the wavelength of a string wave, which one is crest of the wave, which one is trough of the wave, which one is wave amplitudes, which one is incoming wave and reflective wave. Closing activities got scores 3.5. In these activities, all phases were completed, but the time needed to perform learning was extended from the allocated time. This was due to the first time for the teacher to conduct the science process skills based teaching learning.

The student science skill processes (SSP) improved. The SSP aspects were controlled because the teacher gave training session to the students before the class

began. The existence of an appropriate assessment system was also a factor to support these achievements. The interview result and the students response revealed that the students felt happy, they were more active, more motivated to learn, braver to express their opinions and they felt that their science process skills were trained.

CONCLUSION

The results showed that the student science skill processes were improved and their responses both the learning activities that use PS and the change of students' science process skills are very good.

Suggestion

If the research is going to be continued, it is expected that the time allocation to be used and the interviews result have to be considered. The students commented that the tools and the materials (stick and rope) used in the experiment were less attractive. Insteads, we recommended to use a rope for skipping.

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