IMPLEMENTATION OF GUIDED INQUIRY WORKSHEET ON THE TOPIC OF ATOMIC STRUCTURE QUANTUM MECHANICS ON GRADE X

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ABSTRACT

Students are required personally to be more active through observing, questioning, collecting data, associating and communicating in the 2013 curriculum. There are several important changes in the curriculum of 2013, 1) teacher-centered learning become student-centered learning, 2) one-way teaching (teacher-student interaction) into interactive learning, 3) passive learning into active-looking learning (inquiry learning). One of the learning models that implements the 2013 curriculum is the guided inquiry learning model. The guided inquiry learning model is a student-centered learning model, students work in small groups with individual roles to ensure that all students are fully engaged in the learning process. To support the implementation of guided inquiry learning model implemented in small groups, the use of guided inquiry worksheet. Guided inquiry worksheet is made based on guided inquiry learning cycle consisting of five stages of orientation, exploration, concept formation, applications and closing. This research is experimental research, the design Randomized Control Group Posttest Only Design. The study sample consisted of two classes, experimental class and control classes were obtained through simple random sampling technique. Based on the test results obtained by the average value of the experimental class (58.39) was higher than the control class (48.71). Results of tests of normality and homogeneity of the final test results obtained that both classes normally distributed and homogenous samples. Data analysis was performed using t-test at the 0.05 significance level obtained \( t_{\text{Exp}} = 5.12 \) and \( t_{\text{Cntrl}} = 1.67 \). Based on the analysis shows that the learning outcomes of students who use guided inquiry worksheet is significantly higher than the learning outcomes of students who use general worksheet on the topic of atomic structure quantum mechanics on grade X.

KEYWORDS: guided inquiry worksheet, learning model, learning outcomes.

INTRODUCTION:

Students are required to be more personally active through observing, questioning, collecting data, associating and communicating in the 2013 curriculum. There are several important changes in the curriculum of 2013, 1) teacher-centered learning become student-centered learning, 2) one-way teaching (teacher-student interaction) into interactive learning, 3) passive learning into active-looking learning (inquiry learning).

One of the learning models that implements the 2013 curriculum is the guided inquiry learning model. The guided inquiry learning model is a student-centered learning model, students work in small groups with individual roles to ensure that all students are fully engaged in the learning process. To support the implementation of guided inquiry learning model that is implemented in small groups then used the guided inquiry worksheet.

Guided inquiry worksheet is made based on guided inquiry learning cycle consisting of five stages, orientation, exploration, concept formation, application and closing. These five stages are in line with the demands of the 2013 curriculum, where the five stages contain observation, questioning, data collection, association and communicating activities demanded in the 2013 curriculum. The topic of worksheet used in this research is atomic structure quantum mechanics based on guided inquiry. The worksheet has been feasibility test, that is validity test with validity value equal to 0.795 with high validity category and practice test with value 0.95 from teacher and 0.88 from student with very high practice category. The atomic structure of quantum mechanics is one of the topic on grade X. The worksheet that used in this study has also never been tested.

MATERIALS AND METHODS:

This study is experimental research that conduct treatment (manipulation) to the research variable (independent variable). Then, observe the consequences of the treatment on the research object (dependent variable). The design of experimental research is Randomized Control-Group Posttest Only Design. The population of this study is all students on grade X. The sample in this study consists of two classes, experimental class and control class. Sampling was done by simple random sampling technique.

Experimental class is by using the guided inquiry worksheet developed by Rahmi Susmiati, who passed the test of validity and practicality. While in the control class used a general worksheet. Both classes are then performed the same test (posttest).

The research was conducted in three stages, preparation stage, implementation stage, and evaluation stage. The preparation stages are to determine the place and the schedule of the study, the population and sample, the control class and experimental class, prepare the guided inquiry worksheet, analyze the 2013 curriculum, develop the lesson plan, make the test grille, try tests and keywords, compose a grid of final tests, final tests and answer keys. At the implementation stage, the worksheet is implemented in the research class. In the final stages of the study carried out the final test of the two classes, then proceed with data processing and the last is to draw conclusions.
Based on normality test and homogeneity test that both classes were normally distributed and had homogeneous variance. Therefore, to test the hypothesis used t-test and hypothesis test results data. Based on data processing obtained $t = 5.12$ and $t_0 = 1.67$. In accordance with the criteria of hypothesis testing is $H_0$ rejected if $t > t_0$. Thus, it can be concluded that student learning outcomes that use guided inquiry worksheet are significantly higher than student learning outcomes using general worksheet on the topic of atomic structure of quantum mechanics.

**CONCLUSIONS:**
Based on the research conducted shows that there are differences in learning outcomes in the two sample classes. This can be seen from the average of student learning outcomes, where the students’ learning outcomes in the experimental class is 58.39 and the control class is 48.71. Based on normality and homogeneity test results, it is found that both classes are normally distributed and homogeneous. Therefore for hypothesis testing done with t-test. From the t-test results obtained that the proposed research hypothesis is accepted, the results of student learning using inquiry worksheet guided significantly higher than the results of student learning using the general worksheet on the topic of atomic structure of quantum mechanics on class $X$.

The high learning outcomes of the students in the experiment class significantly from the students learning outcomes in the control class were also shown based on the students ability in the answers to the C3 level (application/application) and C4 (analyze). Based on the calculation, it is found that the experimental class students can answer more about C3 and C4 level compared to control class students, that is experiment class $59.23\%$ C3 and $55\%$ C4 while control class $41.83\%$ C3 and $38.3\%$ C4.

The number of students who did not achieve the standard score is probably due to the learning process in the two sample classes using only the worksheet, without using any other teaching materials. It is also one of the obstacles encountered in this study, because the teaching materials that will be used at the time of the research are not yet available, so that during the learning process in both sample classes, students only use worksheets.

**REFERENCES:**