

Effectiveness of Guided Inquiry Learning Models Viewed From Physics Learning Achievements

Syamsudin Amir dan Dewi Hikmah Marisda

Pendidikan Fisika, Fakultas Keguruan dan Ilmu Pendidikan,
Universitas Muhammadiyah Makassar, Indonesia
dewihikmah@unismuh.ac.id

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Abstract

This study aimed to analyze the improvement in physics learning outcomes of XI MIA State Madrasah Aliyah 2 students in East Flores after being taught using the Guided Inquiry Learning model. The type of research was a pre-experimental design with one group Pretest – Post-test. The sample in this study was saturated, namely all students of class XI MIA MAN 2 Flores. The research instrument used was a learning achievement test consisting of 30 items in multiple-choice, validated by two experts. The data obtained was then analyzed in a quantitative descriptive manner for the increased learning achievement using the N-gain test. The results showed an increase in student learning achievement, as seen from the acquisition of physics learning outcomes after the guided inquiry learning was applied. Based on the N-gain value, students' physics learning achievement was in the medium category. Also, the acquisition of student learning outcomes has increased after the guided inquiry learning model was applied--The results of this study expected to be one of the solutions in learning physics.

Keywords: Guided Inquiry; Inquiry Learning; Physics Learning Achievement

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INTRODUCTION

Physics lessons are often complained by students as difficult lessons. Physics is one of the science subjects whose purpose is to study nature systematically. The study of physics is not only mastery of facts, concepts, or principles but also based on findings. Understanding the characteristics of physics has an impact on the physics learning process. Physics is one of the compulsory subjects taught in high school (Marisda, 2018). Physics is one part of Natural Sciences that

studies natural phenomena or natural behavior and various symptoms.

Further said (Marisda, 2016), in his article that physics is a basic science for other related sciences. In studying physics, it is not only enough to learn from books or teacher explanations, but physics must be understood through a process of inquiry or scientific inquiry by the students themselves. In fact, in schools, teachers mostly apply a teacher-centered learning model. Students receive information directly without

being accompanied by the inquiry process, where it is formed, where the formula comes from, etc. Furthermore, it turns out that physics causes students to feel that physics is a difficult subject that only contains complex mathematical formulas.

Correspondingly, the results of interviews with teachers in physics studies were conducted in schools in October 2019, especially in physics at State Madrasah Aliyah 2 East Flores. Observation results stated that the learning model that often being used is a direct learning model with varied lecture methods, discussions, and questions and answers. In the implementation of physics, learning is still dominated by the teacher. The teacher explains the material or physics concepts through the lecture method, then students are given practice questions by following the material taught. The results in lack of students' ability to apply the material learned seem less meaningful, which causes students' physics learning achievement is low. Initial data obtained in the field showed that only about 30,77% of students experienced complete learning. The rest gained scores below the KKM (minimum learning completeness criteria) value determined by the school for physics subjects.

In the 2013 curriculum, learning is directed at three essential aspects, namely character, competence, and literacy. To achieve these three things, one way that can do is to create an atmosphere of learning that is effective and enjoyable for students (Marisda, 2019). So, the teacher as an educator, must be creative in presenting knowledge so as not to be monotonous. One is suitable for the field's condition, namely the guided inquiry learning model (guided inquiry). This model provides opportunities for students to conduct scientific investigations of knowledge (Nasution, 2018). It is

expected that learning could be meaningful, so students better understand the physics material presented by the teacher. Then, learning outcomes or learning achievements can be increased.

Based on journal studies, several studies have been found that applied guided inquiry learning. Other research that also uses inquiry learning with different methods states that the inquiry learning model with the pictorial riddle method can increase student activity in the learning process (Febriana, 2018). Guided inquiry learning is a model of inquiry learning in which the teacher provides guidance or instructions quite broadly to students (Susilawati., 2013). Further explained (Fathurrohman, 2015), guided inquiry learning is an inquiry learning model in which the teacher provides extensive guidance or instructions to students. In guided inquiry learning, the teacher does not just let go of the activities carried out by students.

This study has a slight difference from previous research by (Zani et al., 2019). The guided inquiry learning model on static fluid material used a multiple-choice form of Science Process Skills test in data collection. Whereas this study used a trained inquiry learning model with a test instrument in the form of an examination of student learning outcomes in the cognitive domain. The mental parts in question are C1 (knowledge), C2 (understanding), C3 (application), C4 (analysis), and C5 (synthesis). In this school, State Madrasah Aliyah 2 school, the guided inquiry learning model has never been applied.

Based on the background description and literature study, the problem formulated in this study is "how much is the increase in physics learning achievement of students in class XI MIA MAN 2 East Flores after applying the guided inquiry learning model". From

these problems, the purpose of writing is: Describe the physics learning achievement of students in class XI MIA MAN 2 East Flores before applying the guided inquiry learning model; describe the learning achievement of students in class XI MIA MAN 2, East Flores, after being taught with the guided inquiry learning model. And explain how much increase in learning achievement of students in class XI MIA MAN 2 East Flores after being shown with the trained inquiry learning model.

METHOD

This research type was a pre-experimental design involving one class that was given treatment, with One Group Pretest-Posttest design method.

$$O_1 \times O_2$$

(Sugiyono, 2017)

Researchers used this type of research because at the location of the study, the number of samples was limited and no other research variables were controlled. The population and illustration in this study were all students of class XI MIA MAN 2 East Flores, amounting to 13 students. Sampling in this study used purposive sampling. This method was chosen because the number of students in this school was limited. It only has one class at each level. The research location was at MAN 2 East Flores School, the time of the research was from October 2019 to November 2019. The data collection techniques used were test instruments in the form of multiple-choice, with cognitive domains including memory (C1), comprehension (C2), application (C3), analysis (C4), and synthesis (C5). The cognitive domain that was tested was limited to C₁ to C₅.

This adjusted to the essential competencies of the material in this study. Data analysis techniques used descriptive analysis and n-gain analysis

to see an increase in learning achievement.

Descriptive statistics used to describe the results of research in the form of an average score of students, the lowest score, the highest score, standard deviation, distribution, and frequency of data.

After all data was collected, the n-gain test was performed with the gain index interpretation criteria. Normalized gain (N-gain) = pretest-posttest score.

Table 1 Categories Normalized Gain Levels

Limit	Categories
$g \geq 0,7$	Height
$0,3 \leq g < 0,7$	Medium
$g < 0,3$	Low

(Hake, 1998)

RESULT AND DISCUSSION

The inquiry learning model used in this research was the guided inquiry learning model. Guided inquiry is a learning model in which the teacher teaches students to carry out activities by asking questions at the beginning and leading to a discussion. As for the syntax of guided learning in this study, it consists of sixth stages, namely starting with the observation stage to find problems. The second stage is formulating a hypothesis. The third stage is planning and doing simple practicum. The fourth stage is observing and concluding the data. The fifth stage is analyzing the data. The last stage is making conclusions based on the data that has been analyzed.

The learning material in this research is static fluid, referring to the basic competence 3.3 in the 2013 curriculum. Its basic competence is applying static fluid law in everyday life. The materials used are capillary, Archimedes' law, surface tension, and Pascal's law.

The data that has been collected, then analyzed by descriptive statistics and n-gain test. The descriptive analysis of the

pretest and posttest scores can be seen in Table 3 below.

Table 2 Descriptive Analysis of Student Learning Physics Pretension Score for Class XI MIA MAN 2 East Flores

Statistics	Statistics Score	
	Pretest	Posttest
Sample Size	13	13
Highest Scores	20	27
Lowest Score	12	18
An ideal rating of	30	30
Score range	8	8
An average of	15,77	22,38
Standard deviation	2,14	2,35

Before applying the guided inquiry learning model, the average pretest score of students was 15,77, and after applying the guided inquiry learning model, the average posttest score of students was 22,38. From the results of this descriptive analysis, it can be seen that there was an increase in the average score of students' cognitive learning outcomes. It is in line with research (Hifni & Turnip, 2015), which stated that the application of inquiry learning training models could improve logical thinking skills. Likewise, a study conducted (Dewi, 2013) stated that there were significant differences in learning outcomes between students who used guided inquiry models and conventional learning models. From the results of his research, it appeared that the learning outcomes of students taught with inquiry learning models were higher than those taught with traditional learning models. Other research relevant to this research is research conducted by (Maikristina, 2013), which stated that the application of guided inquiry learning could improve student learning outcomes and students' science process skills.

In addition to the increased learning outcomes of physics, there was also an increase in the student learning activity.

Usually, out of 13 students, only one or two people dared to answer questions or ask questions. After guided inquiry learning was applied, students were more active in asking and answering questions and group discussion activities.

For the analysis of the calculating of the n-gain value:

Table 3 Acquisition of Pretest and Posttest Scores

The mean value learning outcomes of physics	
Pretest	Posttest
15,77	22,38

$$N_{\text{gain}} = \frac{\text{posttest} - \text{pretest}}{\text{Max score} - \text{pretest}}$$

$$= \frac{22,38 - 15,77}{30,00 - 15,77}$$

$$= 0,465 \text{ (medium)}$$

From the estimation of the n-gain significance, it resulted that the physics learning achievement of XI MIA MAN 2 East Flores had a score of 0,465. The value shows that the physics learning achievement was in the medium category.

The advantages of the guided inquiry learning model that causes learning outcomes to increase are that the teacher implements a more structured learning planning, besides the trained inquiry learning model are more effective in improving student learning motivation than direct learning. In addition, through the inquiry process, students are deeply involved mentally or physically to solve problems given by the teacher. Students will be accustomed to behaving like a scientist, namely thorough, objective, creative, and respectful of opinions other people (Lumentut, 2017)

CONCLUSION

Improvement of student's physics achievement was in the medium category (0,465). The impact of using guided inquiry in my research was students became more enthusiastic in participating in learning, especially when given practicum.

Recommendations for further research, researchers should prepare learning tools carefully so that the time allocation follows the teaching material, primarily if the material being taught requires additional practicum and discussion.

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