The Influence of the Guided Inquiry Learning Model on Learning Outcomes of Student Elasticity Material

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Abstract : The purpose of this research is to determine the effect of the guided inquiry learning model on student learning outcomes on the elasticity of the material . This type of research is a quasi-experimental using a control group and an experimental group. In this study, the population was used, namely all students in class XI MIPA SMAN 1 Jonggat Teachings in 2022-2023. Meanwhile, the samples for this study were class XI MIPA 4 and XI MIPA 5 which were determined based on the Purposive Sampling method. Instruments were used in the form of questionnaires, data analysis techniques were carried out with homogeneity, normality, and hypothesis testing. The results of this study showed that there was an influence of the guided inquiry learning model on the learning outcomes of students' elasticity material with a sig value obtained of 0.00 <0.05 and obtained $t_{hitung} = 3.51$ and $t_{tabel} = 2.00$ meaning that there was a significant influence of the guided inquiry learning model on learning outcomes

Keywords: Learning Model, Guided Inquiry, learning outcomes, elasticity

Introduction

Education is basically a conscious effort to develop the potential of students by encouraging and facilitating their learning activities. As stated in Law No. 20 of 2003 concerning the National Education system Chapter I Article 1 it states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, control self, personality, intelligence, noble character, and the skills needed by himself, society, nation, and the State (Nasution *et al* ., 2018). The implementation of education is carried out in the form of learning activities. Because the progress of a country can be seen from the development of technology and the condition of its educators, it is necessary to strive to improve the quality of educators.

One of the branches of science that must be studied in school is Physics. According to Jayanti & Bunga (2018) Physics is an interesting subject object

and requires a strong basic understanding. Physics lessons focus more on the ability of students to analyze their knowledge with events or natural phenomena that they experience in everyday life. The study of physics requires students to be able to think logically, critically, creatively, and be able to argue correctly and physics lessons are not only a collection of facts, concepts or principles but also a process of discovery and prospects for further development in apply it in everyday life.

The objectives of learning physics contained in the 2013 Curriculum framework are to master concepts and principles and have the skills to develop knowledge and self-confidence as provisions for continuing education at a higher level and developing science and technology (Kemendikbud, 2014). Based on these learning objectives, the implementation of physics subjects at the SMA/MA level must be a means to train students so they can master the knowledge, concepts and principles of physics. Therefore, learning Physics for high school students provides a big challenge for the teachers.

The success of the student learning process at school can be observed from the learning outcomes achieved. Aisyah, (2017) said that learning outcomes are a number of experiences gained and produce learning achievements from students as a whole and this occurs because of changes in behavior after participating in the teaching and learning process in accordance with educational goals. According to Kurniawan *et al.,* (2017) the factors that influence learning outcomes are internal factors and external factors. Internal factors are factors that come from within a person while external factors are factors that come from outside the individual. Both of these factors can be an obstacle or support for student learning.

Based on observations at SMAN 1 Jonggat, physics is often considered a subject that is difficult, boring, and has too many formulas. In addition, researchers received information that the physics learning process that has been going on so far is still dominated by conventional learning and is still centered on the teacher, not on students. In this learning, the teacher still uses lecture and discussion methods and still relies on textbooks and homework

which are packaged in the form of worksheets. Based on the results of interviews with teachers, it was found that the students were less active during the learning process, so that the impact on the assessment of critical thinking skills and the learning outcomes of students through conventional learning was still low. This is proven by the number of students participating in remedial activities, which is around 50% with the KKM that has been set by the school for physics subjects is 75.

The guided inquiry learning model is a learning model that places students as learning subjects which means that each student is encouraged to be actively involved in learning activities (Amijaya, 2018). In seeking and carrying out investigations educators must develop students' thinking skills by facilitating students to become thinkers. In the guided inquiry model, students learn to hypothesize so that students are encouraged to think and work on their own initiative to find concepts directly (Anggraini, 2018). Through this, students can develop the ability to think critically to find solutions to any existing problems based on the knowledge that students get themselves. Learners will tend to be more active in learning, especially in expressing their thoughts. When students have the ability to think critically, it also has an impact on learning outcomes.

Responding to these problems, we need a learning model that is not student-oriented so that learning is more student-centered *and* students are more active during learning and can improve the assessment of critical thinking skills and student learning outcomes. The learning model in question is the inquiry learning model. Damhuri, (2020) states that inquiry learning is a learning activity in which students are encouraged to learn through their own active involvement. Inquiry learning has several levels, namely controlled inquiry, guided inquiry, planned inquiry, and free inquiry. For students who are not used to doing learning by finding the physics concepts they are learning for themselves, guidance from the teacher is needed so that students can find the concepts from the physics material they are learning. So in this case, the appropriate inquiry learning model is the guided inquiry learning model.

Sutiyah (2019), Musruri et al (2019), Pratwi et al (2019), Tiro and Risakotta (2020), Purnawati et al (2019), Asni et al (2020), Sutiyah (2019), Muliana (2018), Nurmayani et al (2018), Pertiwi (2018), Pertiwi (2018), and Said et al (2020) in their research found results that there was an impact given by the Inquiry learning model on student learning outcomes. Therefore, through the application of the guided inquiry model, it is expected to be able to improve students' physics learning outcomes. Besides that, learning physics is no longer considered difficult by students and teachers can also provide explanations easily on material that is considered complicated and complex so that students become more active in participating in learning activities and teachers can develop creativity in varying learning models and methods .

Method

The type of research used is quasi-experimental research. The research design used in this study is *the Nonequivalent Control Group Design.* The population in this study were all class XI MIPA students at SMAN 1 Jonggat Teachings in 2022-2023. The sampling technique in this study was *purposive sampling.* The sample used in this study was class XI MIPA 4 and XI MIPA 5. The research instrument was a questionnaire. In this study, trials were carried out on research instruments, namely validity, reliability and different tests.

Validity test was conducted to see whether the research data is valid. While the research reliability test aims to see whether the research data is reliable to be studied at a later time. Then a difficulty test is carried out to find out whether the questions to be tested are difficult to do. A different test was carried out to distinguish between high-ability students and low-ability students . Data collection techniques were carried out using homogeneity tests, normality tests, and hypothesis tests or t-tests. The homogeneity test is used to obtain the assumption that the research sample departs from the same or homogeneous conditions. The test criteria are as follows: If $F_{hitung} > F_{tabel}$, the data is not homogeneous while If $F_{hitung} \leq F_{tabel}$, the data is homogeneous. The normality test $X^2{}_{hitung} > X^2{}_{tabel}$ is to make a comparison between

the data owned and the normally distributed data which has the same mean and standard deviation as the X^2 data owned $X^2{}_{hitung} \leq X^2{}_{tabel}$. then the data is normally distributed. The hypothesis test used is a two-party t-test at a significant level of 5 %, namely a hypothesis that does not show a certain direction with a working hypothesis using parametric statistics, namely *the polled variance t-test.* The formula for the two-party *t-test polled variance t-test* used is as follows (Sugiyono, 2019).

$$t_{hitung} = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

.

Result and Discussion

The purpose of this research is to find out the effect of inquiry learning on student learning outcomes at SMAN 1 Jonggat. The research instrument consisted of 5 critical thinking skills questions and 20 physics learning outcomes questions about elasticity. The instrument test was carried out in class XII MIPA 1 SMAN 1 Jonggat. The test instrument is used to determine the feasibility of the questions to be used in *the pretest* analyzed for validity, reliability, level of difficulty, and discriminatory power. The results of the analysis of the validity test of the critical thinking ability test instrument show that all questions are valid. The results of the analysis of the reliability test of the critical thinking ability test instrument show that all questions are reliable. The results of the test analysis of the difficulty level of the critical thinking ability test instrument showed that all questions were included in the easy category. The results of the analysis of the differentiating power test on the critical thinking ability test instrument showed that 1 item was included in the sufficient category, *1 item was included in the good category and 3 other* questions were included in the very good category . after being given treatment. Result _ *pretest* and *posttest* can be seen in the following table,

Table 1. *Pretest* and *Posttest* Results for Control Class Physics Learning Outcomes

Ability	N	Highest Value _	Lowest Value _	Average _
Pretest	31	72	20	52.80
	31	52	20	34,60
Posttest	31	100	54	80.00
	31	86	40	69,40

Table 2. *Pretest* and *Posttest* Results of Experimental Class Physics Learning Outcomes

Ability	N	Highest Value _	Lowest Value _	Average
Pretest	31	72	20	52.80
	31	52	20	34,60
Posttest	31	100	54	80.00
	31	86	40	69,40

The table above shows the results of *the pretest* and *posttest* that the highest *pretest score for the experimental class is 72* while the highest score for the control class is 52. The lowest score for the experimental class is 20 and for the control class is 20. The average *pretest value for the experimental* class and control class still in the low category. While the highest score in the experimental class was 100 and the control class was 86 while the lowest score in the experimental class was 54 and the control class was 40. The average values of the experimental class and control class were 80.00 and 69.40. The data in table 4.10 shows that the *posttest results* in the experimental class and control class have increased compared to the *pretest scores* in terms of the highest scores, lowest values, and average values.

In the study, the results were sig < 0.05 with a value of 0.00 < 0.05 and obtained $t_{hitung} = 3.51$ and $t_{tabel} = 2.00$ meaning that there was a significant influence of the guided inquiry learning model on learning outcomes. Thus it can be concluded that there is an influence of the guided inquiry learning model on learning outcomes student elasticity

material. This is supported by research conducted by Hosnah et al., (2017) which also states that the guided inquiry learning model has a significant effect on the interest and cognitive learning outcomes of high school students. Thus it can be concluded that there is an influence of the guided inquiry learning model on the learning outcomes of students' elasticity material.

Based on the results of data analysis, it can be seen that the learning outcomes of students in elasticity material with the guided inquiry learning model produce higher learning outcomes compared to using conventional learning models (Jundu et al, 2019). The success of the student learning process at school can be observed from the learning outcomes achieved. These results are in accordance with the opinion of Widana et al (2019) who stated that guided inquiry is a learning model in which students work to find answers to problems raised by the teacher with intensive guidance.

Learning Outcomes are a number of experiences gained and produce learning achievements from students as a whole and this occurs because of changes in behavior after participating in the teaching and learning process in accordance with educational goals . Student learning outcomes can be known at the end of the evaluation. Increasing learning outcomes means that there is a difference between initial learning outcomes and final learning outcomes. If student learning outcomes are higher than initial learning outcomes, then student learning outcomes increase (Zani et al, 2018)

The success of the student learning process at school can be observed from the learning outcomes achieved. the factors that influence learning outcomes are internal factors and external factors. Internal factors are factors that come from within a person while external factors are factors that come from outside the individual. These two factors can become an obstacle or support for student learning (Amijaya et al, 2018).

The guided inquiry learning model is a learning model that places students as learning subjects which means that each student is encouraged to be actively involved in learning activities (Amijaya, 2018). In seeking and carrying

out investigations educators must develop students' thinking skills by facilitating students to become thinkers. In the guided inquiry model, students learn to hypothesize so that students are encouraged to think and work on their own initiative to find concepts directly (Anggraini, 2018). Through this, students can develop the ability to think critically to find solutions to any existing problems based on the knowledge that students get themselves. Learners will tend to be more active in learning, especially in expressing their thoughts. When students have the ability to think critically, it also has an impact on learning outcomes.

The application of guided inquiry learning, students are first given the opportunity to identify the problems given by the teacher, then make hypotheses, find information related to these problems through experiments to obtain data , process data and make conclusions about the problems given based on experiments so that, from activities these students are able to apply cognitive aspects containing six categories: remembering, understanding, applying, analyzing, evaluating, and creating which causes student learning outcomes to increase (Anggraini et al, 2018). This is in accordance with the theory of Hefri and Suhartini (2023) which states that the application of the guided inquiry learning model can improve students' cognitive learning outcomes.

The results of this study are in line with the opinions of Sutiyah (2019), Musruri et al (2019), Pratwi et al (2019), Tiro and Risakotta (2020), Purnawati et al (2019), Asni et al (2020), Sutiyah (2019), Muliana (2018), Nurmayani et al (2018), Pertiwi (2018), Pertiwi (2018), and Said et al (2020) in their research found results that there was an impact given by the Inquiry learning model on student learning outcomes.

In addition, these findings are also in line with the opinions of Widani et al (2020), Murhadi et al (2019), Nanda (2020), Firmansyah and Baharudin (2022), Yendrita and Khaharman (2021), oktriyeni et al (2022) with similar results that the application guided inquiry learning, students are first given the opportunity to identify the problems given by the teacher, then make hypotheses, find information related to these problems through experiments to

obtain data , process data and make conclusions about the problems given, this has an impact on the results student learning.

Conclusion

Based on results study And discussion, can concluded that there is an influence of the guided inquiry learning model on the learning outcomes of students' elasticity material . As for suggestions that can be given based on the results of this study, namely in this study for indicators of critical thinking skills, namely indicators (provide further explanation) for both the experimental class and the control class the improvement is still in the low category, so for future researchers who want to use the guided inquiry learning model to improve students' critical thinking skills so that the questions on LKPD (Student Work Sheets) can be further developed so as to facilitate these indicators.

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