

# Implementation of Audio Visual Assistant Guided Discovery Learning Model to Improve Student's Interest in Learning and Concepts Understanding

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**Abstract:** This study aims to determine the increase in students' interest in learning and understanding of students' concepts on elasticity and Hooke's law which is taught through the Guide Discovery Learning model assisted by audio-visual media at MAN 4 Aceh Besar. The method in this study is a quasi-experimental design with a pretest posttest control group. This research was conducted on students of class XI MAN 4 Aceh Besar. The sampling technique in this research is purposive sampling. The instruments used are questionnaires and questions. The results of the analysis of the t test (independent sample t test) obtained a significance value of  $0.000 < 0.05$ , so it can be concluded that  $H_a$  is accepted, meaning that there is a difference in the average learning interest of the experimental class and control class students. The results of the N-gain analysis of the experimental class obtained an average score of 0.68 and the control class obtained an average score of 0.42 in the medium category. The results of the analysis of the t test (independent sample t test) obtained a significance value of  $0.000 < 0.05$ , so it can be concluded that  $H_a$  is accepted, meaning that there is a difference in the average understanding of the concepts of the experimental class and control class students. The conclusion in this study proves that Guided Discovery Learning assisted by audio-visual media can increase students' interest in learning and understanding of students' concepts on elasticity and Hooke's law.

**Keywords:** Guided Discovery Learning Model; Learning Interest; Student Concept Understanding.

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## Introduction

Along with the advancement of information and communication technology, the demand for education is getting higher. Good education occurs because of a good learning process. Learning is a process built by teachers to develop students' thinking skills, as well as improve the ability to construct new knowledge as an effort to master the concepts of subject matter, one of which is physics subjects (Dahlia, et al., 2018). Physics is a branch of science that studies natural

phenomena and phenomena empirically, logically, systematically and rationally which involves scientific processes and attitudes. When studying physics, students will be introduced to physics products in the form of materials, concepts, principles, theories, principles, and physical laws (Alfadilah, et al., 2017).

Physics is one of the subjects that are considered difficult to understand, difficult, less interesting, and boring for students so that students pay less attention to explanations from the teacher. This makes students less interested in learning. Interest is one of the

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psychological aspects that can encourage humans to achieve goals. Someone who has an interest in an object tends to give attention or feel greater pleasure to the object. If the object does not cause pleasure, then the person will not have an interest in the object. Therefore, the level of attention or a person's pleasure towards an object is influenced by the level of that person's interest (Rahim, 2019). Interest is a persistent tendency of the soul to pay attention and remember some activities or activities. Interest is a sense of preference and a sense of attachment to a thing or activity, without anyone telling (Maryani, et al, 2016).

Lack of interest in the learning process taught by the teacher has a negative impact on students' conceptual understanding. Concept understanding is a level where students are able to interpret an object to help someone understand and understand certain objects (Vicka, et al., 2018). For this reason, in schools, a pleasant learning atmosphere must be designed by involving students actively in understanding physics concepts, so that students are not only recipients of information from the teacher. Teaching is not just an activity that merely conveys information to students, but a process that demands a change in the role of a teacher from an informant to a learning manager that aims to teach students. Teaching students means that students are actively involved in the learning process and it is hoped that changes in student behavior will occur in accordance with the goals that have been set (Sri, et al., 2013).

Based on observations and interviews with teachers that have been conducted at MAN 4 Aceh Besar, the teaching style has not varied. Still using teacher-centered learning. The explanation of the material taught is only orally and explains the concept on the blackboard without stimulation or discussion about the abstract material being taught. Likewise, when the researcher interviewed students, he said that it was still difficult to understand the concepts of physics and made students less interested in learning physics such as elasticity and Hooke's law because of the unattractive way of learning and difficult physics material to understand. This is in accordance with the 2018 National Examination score at MAN 4 Aceh Besar on dynamics material which has a value of 27.78% (Puspendik, 2018). This fact is also supported by the scores of students at MAN 4 Aceh Besar that more than 50% of students are still below the Minimum Completeness Criteria, which is 75. of the 25 students, only 8 students have completed scores above the Minimum Completeness Criterion. For this reason, teachers need to create good means to deliver physics learning materials, so that students can understand the learning and be interested in learning.

One of the efforts to improve learning can be done by applying Guided Discovery Learning. The Guided Discovery Learning model is a learning model that researchers will apply to students because the discovery model encourages students to be actively involved in understanding concepts and principles. The Guided Discovery Learning model is a model that can make students participate actively and positively in the learning process and self-regulate and build knowledge (Lyu, et al, 2018). The Guided Discovery Learning model is one of the discovery models, where the Guided Discovery Learning tries to create a learning situation that involves students learning actively and independently in finding a concept or theory, understanding, and problem-solving (Priansa, 2017). The guided discovery learning model emphasizes learning creativity, students are encouraged to think and analyze themselves so they can find concepts based on the data provided through experimental activities and book exploration (Sumiadi, et al., 2015). guided. Guided discovery is one of the learning models in which students are not presented with final results but the teacher guides students to participate more actively in finding facts, concepts, and principles through discovery activities so that students can build their own knowledge (Dewi, et al., 2017 ).

When a teacher conveys information to students, learning media is needed. Media are all forms used for the process of distributing information, in terms of education the role of learning media is very necessary for a teaching and learning activity. Educators can use television films, or pictures to provide better information to students. Through learning media, things that are abstract can become more concrete, one of which is audio-visual media (Sanjaya, 2012). One of the uses of good media is used in overcoming the problem of the absence of a real laboratory to improve understanding of concepts (Khairunnisak, 2018).

Audio-visual media is media that involves the senses of hearing and sight at once in one process. The retention rate (absorption and memory) of students towards the subject matter can increase significantly if the initial information acquisition process is greater through the senses of hearing and sight (Utami, 2013). The comprehension of students in understanding the concept of learning is different, such as there are students who understand more quickly by sound, seeing, or by experiencing it themselves. This is in accordance with what was stated by Rio and Ronny, (2012) that the average human brain remembers 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we hear, and see. 70% if we talk about it with other people, 80% if we experience and practice it, 95% if we teach it to others.

Research using the Guided Discovery Learning model has been widely applied by previous researchers. In the research of Pardede, et al., (2016) the collaborative-based Guided Discovery Learning model, because in the process of discovering the concept of physics the teacher will provide guidance or guidance that is quite broad to students in improving science process skills and high-level cognitive abilities of students. The Guided Discovery Learning model used collaborates using flash media to students who are taught by conventional learning. Niswatu Zahro, et al, (2018) in their research also uses the Guided Discovery Learning model assisted by audio-visual media by using audio-visual in the form of videos that can make it easier for students to capture the stimulus given by the teacher, and to visualize abstract science concepts or those that cannot be carried. into the classroom so that it is easy for students to understand so that it can improve the literacy of elementary school students.

**Method**

This study uses a Quasi-Experimental Design research design with the Nonequivalent Control Group Design design, in this design, there are pretest and posttest in two classes, namely the experimental class and the control class which were chosen not randomly (Sugiyono, 2018). The paradigm in this study is shown in Table 1.

**Table 1.** Research Design Nonequivalent Control Group Design

Subject	Pretest	Treatment	Posttest
Experiment	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>
Control	O <sub>3</sub>	X <sub>2</sub>	O <sub>4</sub>

Sugiyono (2018)

Keterangan:

O<sub>1</sub> = Experimental class pretest

O<sub>2</sub> = Experiment class posttest

O<sub>3</sub> = Control class pretest

O<sub>4</sub> = Control class posttest

X<sub>1</sub> = The treatment in the experimental class uses the Guided Discovery Learning model with media assistance

X<sub>2</sub> = Treatment in class using conventional models

The population in this study were all students of class XI IPA MAN 4 Aceh Besar in the odd semester of 2021/2022, totaling 75 people. The research sample used was class XI majoring in science at MAN 4 Aceh Besar. Class XI majoring in science at MAN 4 Aceh Besar consists of 3 classes. The researcher used two classes (experimental and control classes), class XI IPA 1 which consisted of 25 students, and class XI IPA 2

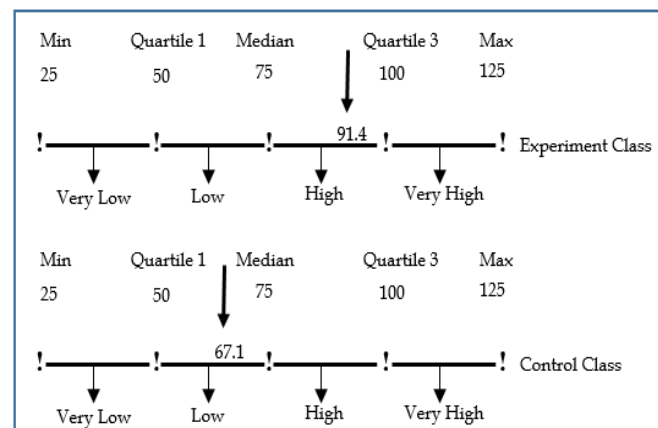
which amounted to 25 students with a Non-Probability Sampling sampling technique, namely Purposive Sampling.

The instruments used in this research are questionnaires and questions. The data collection procedure was carried out by distributing questions about understanding the concept of pretest students, namely before applying the learning treatment to the experimental class and control class. After the teaching and learning activities in both classes took place, then the final stage was distributing a learning interest questionnaire and posttest questions. The data analysis technique in this study used scale calculations, N-gain equations, and hypothesis testing (independent sample t-test). The prerequisite test in the independent sample t-test consists of the Kolmogorov-Smirnov normality test and the homogeneity test.

**Result and Discussion**

Interest is a concentration of attention that contains elements of feeling, pleasure, the inclination of the heart, an involuntary desire that is active in nature to receive something from the environment. Interest in learning in this study was measured through four indicators including feelings of pleasure, interest, attention, and student involvement (Sulistiyani, et al., 2016).

Students' interest in learning was measured through the results of the questionnaire analysis answered by 25 students in both the experimental class and the control class. Analysis of learning interest aims to determine the increase and differences in student interest in learning after applying the learning treatment in each class. Data analysis of student interest in learning uses the help of Excel and SPSS version 22 applications. To find out the overall increase in student interest in learning, both in the experimental class and control class, it can be seen in Figure 1.



**Figure 1.** Comparison of Student Interest Results

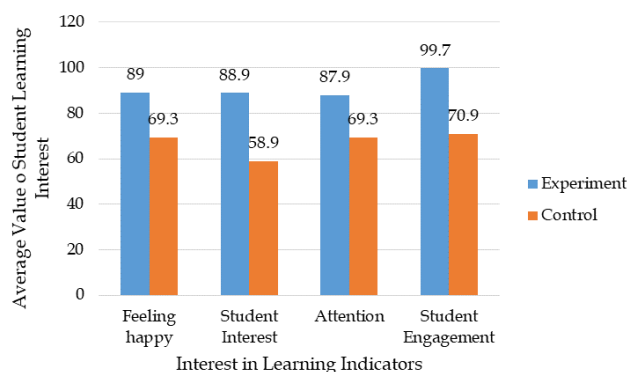
Figure 1. shows the overall results of the indicators of student interest in the experimental class and the control class. Based on the results of data analysis, it was obtained that the average student interest in learning after applying the Guided Discovery Learning model assisted by audio-visual media in the experimental class was 91.4 included in the high category, while the application of the Direct Instruction model in the control class was 67.1 included in the low category.

The difference in the value of student interest in learning in the experimental and control classes is because the Guided Discovery Learning model assisted by audio-visuals makes students more active in learning such as being active in discussions, asking questions, working on Student Worksheets and assignments from the teacher, interested in the learning provided by the teacher. the teacher is interested in the media displayed by the teacher, the display of the Student Worksheet, feels happy to learn with discussion and discovery, and can see directly the material taught by the teacher through the media, while the Direct Instruction model is more teacher-centered so that students are less involved in the learning process and reduce interest in learning because of the conventional explanation of the material. In line with research conducted by Arafah (2020) that the Guided Discovery Learning model can increase student interest in learning higher than the conventional model. Furthermore, to find out students' interest in learning on each indicator, both in the experimental class and the control class, it can be seen in Table 2. and Figure 2.

**Table 2.** Results of Analysis of Student Interest in Experiment Class and Control Class

Indicator	Experiment Class		Control Class	
	Average	Category	Average	Category
Feeling happy	89.00	High	69.30	Low
Student Interest	88.90	High	58.90	Low
Attention	87.90	High	69.30	Low
Student Engagement	99.70	High	70.90	Low

The results of the data analysis of student interest in learning in Table 2. show that the average score of the experimental class students obtained a score of  $75 < x < 100$  included in the high category, then the control class obtained an average score of  $50 < x < 75$  included in the low category. Furthermore, the results of the analysis of the average student interest in learning in the two classes can also be seen in Figure 2.



**Figure 2.** The Average Results of Students' Interest in Learning

Figure 2. shows the results of the average student interest in each indicator of the experimental class and the control class. Based on the results of data analysis, it shows that the student's interest in learning in the experimental class after the Guided Discovery Learning model is applied with the aid of audio-visual media has the highest average score on the indicator of student involvement, which is 99.7 in the high category. Guided Discovery Learning model assisted by audio-visual makes students actively discuss and be directly involved in discovery learning. Whereas in the control class after applying the Direct Instruction conventional learning model it has the highest score on the student involvement indicator, which is 70.9 in the low category, where this learning is teacher-centered so that students are less active in learning physics and cause a lack of student involvement in the learning process on the material elasticity and Hooke's law.

The results above can be concluded that the application of the Guided Discovery Learning model assisted by audio-visual media is able to increase interest in learning better than conventional learning models. The students' interest in learning increased in the high category in the experimental class, inversely with the students' interest in learning in the control class in the low category, which was taught through the application of the Direct Instruction learning model. The Guided Discovery Learning model is one of the learning models that can increase student interest in learning, because this model is able to create a feeling of pleasure for students towards teaching materials, an active learning atmosphere, the emergence of student learning independence through concept discoveries based on previous problems.

Audio-visual media is a media that makes students interested, can see directly and pay attention to the elasticity and Hooke's law that is taught. This is in accordance with research conducted by Yerimadesi et al., (2019) which states that the teaching materials provided in the Guided Discovery Learning model can guide students to learn on their own. Amalia et al.,



(2019) said that in the learning process using the Guided Discovery Learning model, students are trained to build concepts that have been obtained at each stage of learning through discovery and data collection which is then constructed into complete and meaningful knowledge. Kartikaningtyas et al., (2017) say that Guided Discovery Learning is a student-oriented learning model that motivates students to engage in learning activities by guessing, using intuition, investigating, drawing conclusions, and being guided by the teacher.

Hypothesis testing is used in the form of an independent sample t-test. The prerequisites for testing the hypothesis consist of; normality test and homogeneity test. Normality test aims to determine whether the data used is normally distributed or not. The normality test used was Kolmogorov-Smirnov. Hypothesis testing aims to determine the average difference in students' interest in learning after applying learning treatment through the application of the Guided Discovery Learning model assisted by audio-visual media in the experimental class and using the direct instruction model in the control class. The results of the analysis of the difference in the average learning interest of students in the two classes can be seen in Table 3.

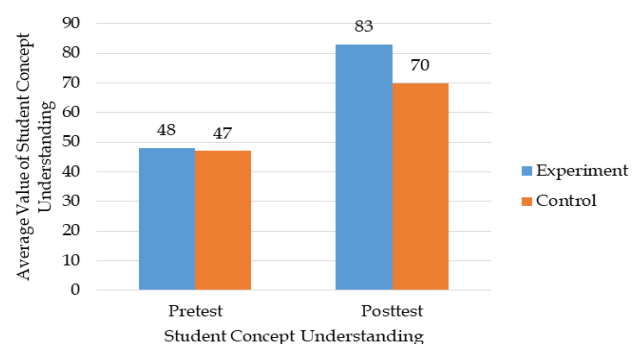
**Table 3.** The results of the average difference in learning interest

Classes	Normality	Homogeneity	Significancy
Experiment	0.200 > 0.05 (normally distributed)	0.000 < 0.05 (inhomogeneous)	0.000 < 0.05 (there is a significant difference)
Control	(normally distributed)		

Based on the results of the analysis of the independent sample t-test, a significance value of 0.000 < 0.05 was obtained, then  $H_a$  was accepted, meaning that there was a difference in the average student learning interest between the experimental class and the control class. The test results show that after applying the Guided Discovery Learning model with the aid of audio-visual media, there are significant differences, so it can be concluded that the application of the Guided Discovery Learning model with the aid of audio-visual media is able to increase student interest in learning better than the Direct Instruction model. The audio-visual aid applied in this study aims to increase students' interest in learning, because through audio-visual media students can see firsthand the phenomena of the concepts being studied such as elasticity. Based on the phenomenon that was displayed at the beginning of the meeting, it could arouse students' interest in learning.

Based on the results of data analysis shows that the Guided Discovery Learning model assisted by audio-visual media is able to increase student interest in learning. Guided Discovery Learning model assisted by audio-visual media is one of the learning models that can foster a safe and comfortable learning atmosphere or conditions so that students can learn actively, students can find their own formulas based on the material being studied with the help of the teacher and can train students in remembering the material that has been studied so that learning runs effectively and optimally.

The purpose of implementing the Guided Discovery Learning model with the aid of audio-visual media is also to improve students' understanding of concepts. Concept understanding is the mastery of a number of learning materials, in which students are able to re-express concepts in a form that is more understandable and able to apply them (Handayani, et al., 2019). Understanding the concept used in this study consists of seven indicators proposed by Anderson, et al., (2002) namely understanding, interpretation, exemplifying, classifying, generalizing, inference, comparing, and explaining. Analysis of increasing understanding of concepts in research will be given treatment after the learning process. To find out the average results of the pretest and posttest students' conceptual understanding of the experimental class and control class, it can be seen in Figure 3.



**Figure 3.** Average Result of Student Concept Understanding

Figure 3 shows the results of the overall average analysis of the indicators of students' conceptual understanding in the experimental class and the control class. Based on the results of data analysis, it shows that after applying the Guided Discovery Learning model assisted by audio-visual media in the experimental class, the average score for understanding students' concepts is greater than the Minimum Completeness Criterion ( $83 > 75$ ), while the average score for understanding the concepts of class students control after applying the Direct Instruction learning model is

smaller than the Minimum Completeness Criterion ( $70 < 75$ ).

Guided Discovery Learning learning model assisted by audio-visual media is able to improve students' understanding of concepts because the stages of learning begin by providing a stimulus or stimulation to students first, so that students are able to solve initial learning problems independently. After students are able to stimulate the learning process, then students begin to identify these problems into a hypothesis. Students are also able to collect data from the previous identification results, then perform data processing, prove it and generalize or conclude the findings. This is in accordance with what was stated by Atiyah, et al. (2020) that the Guided Discovery Learning model is a learning model that encourages students to interact with the environment in order to understand an object.

Hypothesis test for students' conceptual understanding using independent sample t-test. This test aims to determine whether there is a difference in the mean of two unpaired samples. To find out the testing of students' conceptual understanding in the experimental class and control class, a prerequisite test was first tested for normality and homogeneity. A normality test is a test conducted to determine whether the data is normally distributed or not using the Kolmogorov Smirnov test. The homogeneity test aims to determine whether the data in the experimental class and control class are included in the population that has the same variance or not. The results of the hypothesis testing of students' conceptual understanding after applying the Guided Discovery Learning model assisted by audio-visual media in the experimental class and the Direct Instruction model in the control class, can be seen in Table 4.

**Table 4.** Results of the Difference Test in Students' Average Understanding of Concepts.

Classes	Average N-Gain	Normality	Homogeneity	Significancy
Experiment	0.68	0.20 > 0.05 (Normally Distributed)	0.95 > 0.05 (Homogen)	0.00 < 0.05 (There is a significant difference)
Control	0.42	0.20 > 0.05 (Normally Distributed)		

Table 4. shows the results of the analysis of the difference in the average understanding of students' concepts in the experimental class and the control class. Based on the results of data analysis obtained a significance value of  $0.000 < 0.05$ , meaning that there is a difference in the average understanding of students' concepts in the experimental class and the control class. This proves that the Guided Discovery Learning model assisted by audio-visual media is able to increase students' understanding of concepts higher than in the control class. In line with the research conducted by Sahrianti et al. (2021) that the Discovery Learning model is a series of learning activities in which the teacher presents teaching materials not in final form, but provides an opportunity to seek and find their own concepts of the material being studied. This is in accordance with the opinion expressed by Muhammad & Karso (2018) the Guided Discovery Learning model is a development of the Discovery Learning learning model. In principle, Discovery Learning and Guided Discovery Learning are the same, it's just that Guided Discovery Learning emphasizes the process of concept discovery by learners through facilitator guidance.

**Conclusion**

The application of the Guided Discovery Learning model with the aid of audio-visual media can increase students' interest in learning about elasticity and Hooke's law. The results of the analysis of the t-test

(independent sample t-test) obtained a significance value of  $0.000 < 0.05$ , so it can be concluded that  $H_a$  is accepted, meaning that there is a difference in the average learning interest of the experimental class and control class students. The application of the Guided Discovery Learning learning model with the aid of audio-visual media can improve students' understanding of the concept of elasticity and Hooke's law. The results of the N-gain analysis of the experimental class obtained an average score of 0.68 and the control class obtained an average score of 0.42 in the medium category. The results of the analysis of the t-test (independent sample t-test) obtained a significance value of  $0.000 < 0.05$ , so it can be concluded that  $H_a$  is accepted, meaning that there is a difference in the average understanding of the concepts of the experimental class and control class students.

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