The Effect of Sevima Edlink's E-Learning Assisted Guided Inquiry Model on Student Learning Outcomes in Sound Waves Material in Class XI SMA Masehi GBKP Berastagi T.P 2022/2023.

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Abstract

This study aims to determine the effect of Sevima Edlink's e-learning-assisted guided inquiry model on high school students' physics learning outcomes in sound wave material. This research is a type of quasi-experimental research with a two-group pretest-posttest design. The population in this study were all XI MIPA classes at Masehi High School, GBKP Berastagi T.P 2022/2023 and the samples in this study were class XI MIPA 2 (experimental class) and XI MIPA 1 (control class) which were taken by cluster random sampling. The instrument used was a multiple-choice test with 15 questions. The results showed that the average pretest and posttest scores in the experimental class were 36.23 and 80.89. While in the control class were 34.86 and 75.63. Data analysis was carried out by t-test with a significant level of $\alpha = 0.05$, it was found that $t_{calculated} < t_{table} = (2.286 > 1.669)$ then H_0 was rejected and Ha was accepted, which means that there is a significant influence of the guided inquiry model assisted by the e-learning sevima edlink on learning outcomes students in class XI SMA Swasta Massehi GBKP Berastagi on sound waves material.

Keywords: Guided Inquiry, e-learning, learning outcomes.

INTRODUCTION

A The application of Science and Technology (SciTech) in the field of education has transformed the conventional learning system into a modern one, demanding educational personnel to innovate in the delivery of teaching. The utilization of Science and Technology (SciTech) in the realm of education has become something of great significance in the evolution of education. Education is a form of effort undertaken by each individual to advance their abilities through the process of teaching and learning. Presently, education holds immense importance to be attained, as it can determine an individual's quality. As a result, education is often interpreted as a benchmark for success (Anshori & Syam, 2019).

Based on observations conducted by researchers at Masehi High School, GBKP Berastagi, almost all students use smartphones for browsing to complete school assignments. Students also

frequently use smartphones for playing online games and other social media activities. Furthermore, the teaching system still follows a conventional model using lecture-based methods and question-and-answer sessions. The implementation of such a teaching approach creates difficulties for students and diminishes their interest in understanding physics. It is these teaching methods that influence the students' learning outcomes, which are still relatively low. Only 40% of students managed to pass the minimum passing grade during the semester exams.

One effort that teachers can undertake to enhance student learning outcomes is to design engaging physics learning activities based on discovery and investigation, involving students directly in the learning process, thus shifting the focus of learning from the teacher to the student. The intended teaching model is the guided inquiry learning model. Guided inquiry is a teaching model that positions students as the subjects of learning, meaning each student is encouraged to actively participate in the learning activities (Amijaya et al., 2018). In guided inquiry, the teacher's role is that of a motivator and facilitator (Lantowa, 2022). Guided inquiry is a teaching model that can improve student learning outcomes by allowing them to independently design and discover physics concepts, which in turn aids in retaining the material in the students' memory for a longer duration (Sukma et al., 2016).

Guided inquiry can be facilitated using multimedia to assist teachers in delivering information to students (Malau et al., 2019). One of the multimedia tools that can be utilized is e-learning. E-learning is an innovation that can be harnessed in the learning process, not only for the delivery of learning materials but also for the enhancement of various competencies of learners (Danastri et al., 2021). Proper utilization of e-learning can significantly enhance learning outcomes; through e-learning, students can share information and access learning materials at any time, allowing them to solidify their understanding of the subject matter (Hartanto, 2016). An example of e-learning is Sevima Edlink, a platform designed to provide a learning space that connects teachers and students in learning activities that can be conducted anytime and anywhere, offering greater flexibility in study hours. It features tools such as video conferencing, class schedules, interactive quiz creation, class schedule reminders, and class groups for sharing learning materials (Nurasiza et al., 2022).

Based on the description above, a research study is conducted with the title "The Effect of Guided Inquiry Model Assisted by Sevima Edlink E-Learning on Student Learning Outcomes in the Topic of Sound Waves in Class XI of Masehi High School, GBKP Berastagi T.P 2022/2023

METHOD

The research was conducted at Masehi High School, GBKP Berastagi, located at Jalan Merdeka No. 119, Berastagi, Karo Regency, North Sumatra Province. This study was conducted from March to May during the academic year 2022/2023 for the second semester of Class XI.

The population in this study consisted of all students in Class X of Masehi High School, GBKP Berastagi, totaling 35 students in each of the 3 classes. The research sample was drawn from two classes within the population using the cluster random sampling technique. One class, XI MIPA 2, was designated as the experimental group and was taught using the Guided Inquiry Model, while another class, XI MIPA 1, was the control group and received conventional teaching methods.

This research involved two classes that were subjected to different treatments. To assess student learning outcomes resulting from the two treatments, a test was administered to the students. The test included a pre-test before the treatment and a post-test after the treatment. Thus, the research design for this two-group (pretest and posttest) study can be observed in Table 1.

Tabel 1. Desain penelitian Two Group (Pretest dan Postest)

Kelas	Pretest	Perlakuan	Postest
Eksperimen	O_1	X	O_2
Kontrol	O_3	Y	O_4

Information:

O_1 = initial test (pretest) for the experimental class.

O_2 = final test (posttest) for the experimental class.

O_3 = Initial test (pretest) for the control class

O_4 = final test (Posttest) for the control class

X   = Treatment using the guided inquiry teaching model.

Y   = Treatment using the conventional teaching model.

The researcher administered a pre-test to both the experimental and control groups. The instrument used in this study consisted of 15 multiple-choice questions. The test for learning outcomes was first standardized through content validity testing by two faculty members and an expert teacher in accordance with their respective fields of expertise. Once the pre-test data was collected, data analysis was conducted, including tests for normality using the Lilliefors test, homogeneity test, and variance equality test. Subsequently, a two-sided t-test hypothesis was

performed to ascertain the initial abilities of students in both sample groups, with the prerequisite that the initial abilities of both samples must be the same. Following this, the researcher taught the lesson using the guided inquiry model in the experimental group and conventional teaching methods in the control group. The post-test data underwent preliminary testing for normality and homogeneity, and then a t-test was performed to determine whether there was an influence of the guided inquiry teaching model on student learning outcomes compared to conventional teaching methods in the topic of sound waves.

RESULTS AND DISCUSSION

Result

Based on the pre-test data, the average pre-test score of students in the experimental group before being subjected to the guided inquiry teaching model was 36.23 with a standard deviation of 11.19. Meanwhile, in the control group, the average pre-test score of students was 34.86 with a standard deviation of 13.52. A comparison of the pre-test scores between the two classes can be seen in Table 2.

Tabel 2. Perbandingan nilai pretest kelas eksperimen dan kelas kontrol

Kelas Eksperimen				Kelas Kontrol			
Nilai	Frekuensi	Rata-rata	Standar Deviasi	Nilai	Frekuensi	Rata-rata	Standar Deviasi
13	2	36,23	11,19	7	1	34,86	13,52
20	4			20	8		
27	4			27	4		
33	5			33	7		
40	9			40	6		
47	9			47	4		
				53	3		
53	2			60	1		
				67	1		
∑ = 35				∑ = 35			

The results of the pre-tests for both classes can be observed in the following bar chart:
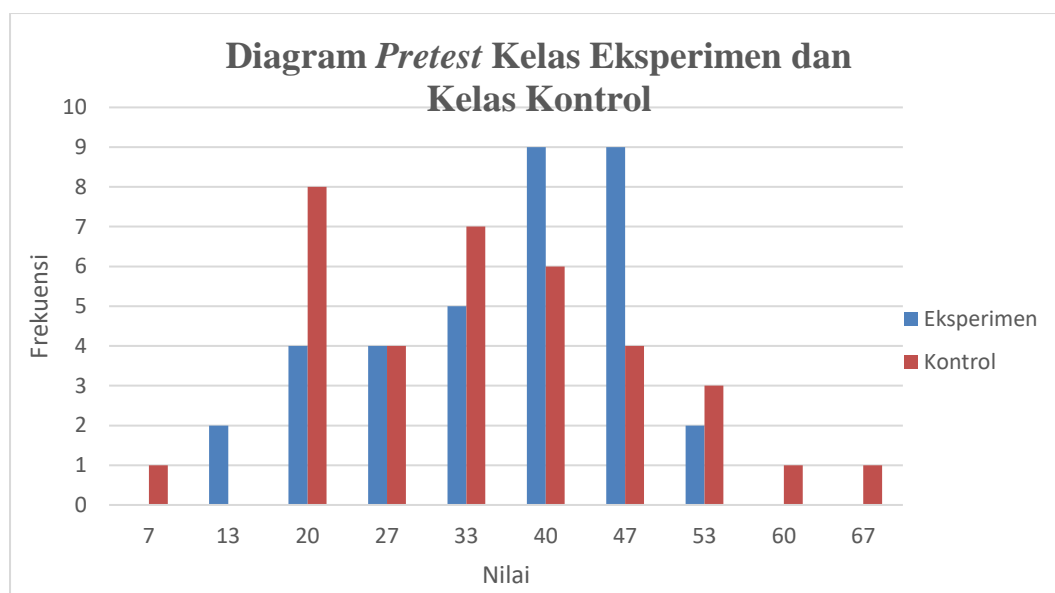
Gambar 1. Diagram batang data *pretest* kelas eksperimen dan kelas kontrol.

Based on the pre-test data of the experimental and control classes, a test of normality and homogeneity of the pre-test data was conducted. The calculation results indicated that the pre-test data exhibited a normal distribution and homogeneity. Subsequently, a hypothesis test was conducted using the t-test. A concise summary of the hypothesis test can be observed in Table 3.

Tabel 3. Ringkasan hasil perhitungan uji t untuk data pretest

| Kelas	Rata Rata	t_{hitung}	t_{tabel}	Kesimpulan
Eksperimen	36,23	0,462	1,997	Kemampuan awal siswa sama
Kontrol	34,86			

Based on the t-test calculation results, it was found that $t_{calculated} < t_{table}$ $(0.462 < 1.997)$, therefore it can be concluded that the initial abilities of students in the experimental and control classes are the same. The next step undertaken by the researcher after administering the pre-test in the experimental class was to implement the treatment using the guided inquiry teaching model.

After the two classes received different treatments, both classes were then given a post-test with the same questions as the pre-test. The results obtained were as follows: the average post-test score for the experimental class after the implementation of the guided inquiry teaching model was 80.89 with a standard deviation of 9.7. Meanwhile, in the control class, the average post-test score for students was 75.63 with a standard deviation of 9.55. A comparison of the post-test scores between the two classes can be seen in Table 4.

Tabel 4. Perbandingan nilai postes kelas eksperimen dan kelas kontrol

Kelas Eksperimen				Kelas Kontrol			
Nilai	Frekuensi	Rata-rata	Standar Deviasi	Nilai	Frekuensi	Rata-rata	Standar Deviasi
60	2			53	2		
67	2			60	2		
73	8	80,89	9,7	67	4	75,63	9,55
80	8			73	9		
87	7			80	10		
93	8			87	8		
∑ = 35				∑ = 35			

The results of the post-tests for both classes can be observed in the following bar chart:
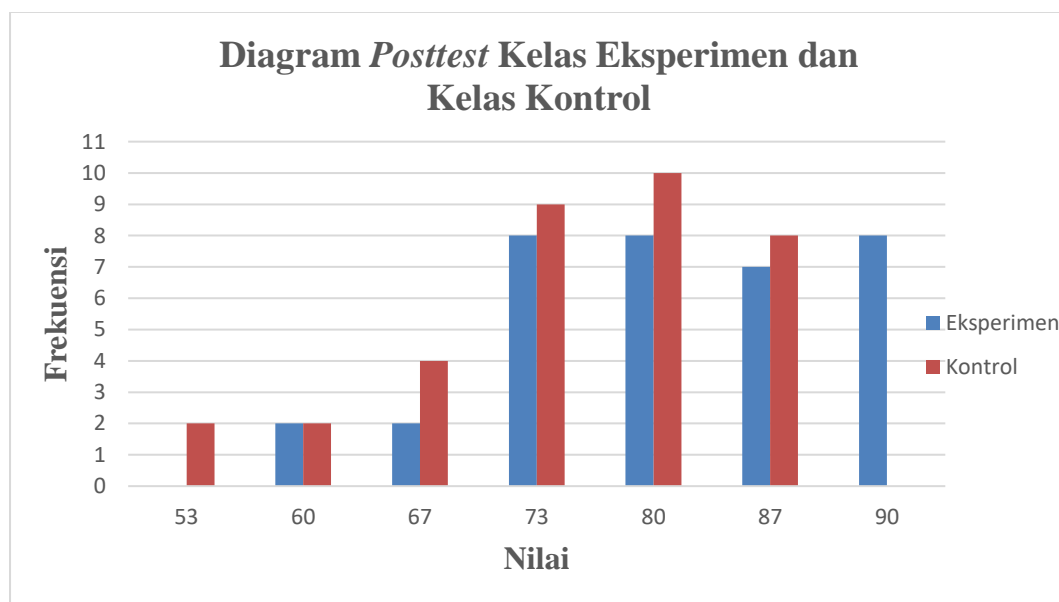
Gambar 4.2. Diagram batang data *posttest* kelas eksperimen dan kelas kontrol

Based on the post-test data of the experimental and control classes, a test of normality and homogeneity of the post-test data was conducted to ascertain the impact after administering

different treatments to both classes. The calculation results indicated that the post-test data exhibited a normal distribution and homogeneity. Subsequently, a hypothesis test was conducted using the t-test for the post-test data. A concise summary of the hypothesis test for the post-test data of both classes can be observed in Table 5.

Tabel 4. Ringkasan hasil perhitungan uji t untuk data posttest

No	Data	Nilai rata-rata	t_{hitung}	t_{tabel}	Kesimpulan
1	*Posttest* Eksperimen	80,89	2,286	1,669	Ha diterima
	Posttest Kontrol	75,63			

Based on Table 5, it can be observed that $t_{calculated} > t_{table}$ (2.286 > 1.669). Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. In other words, there is a significant influence on student learning outcomes using the guided inquiry model assisted by Sevima Edlink e-learning compared to conventional teaching methods in the topic of sound waves.

Discussion

The student learning outcomes in the experimental class and the control class before treatment had average scores of 36.23 in the experimental class and 34.86 in the control class. After receiving different treatments, with the experimental class using the guided inquiry teaching model assisted by Sevima Edlink e-learning and the control class using conventional teaching methods, the average scores were 80.89 in the experimental class and 75.63 in the control class. This finding is supported by previous research conducted by Yulianci et al. (2017), which indicated that the guided inquiry teaching model assisted by interactive multimedia can enhance students' interest and learning outcomes. This is evidenced by the higher average physics learning outcomes of students in the experimental class taught using the guided inquiry teaching model assisted by Sevima Edlink e-learning compared to the control class taught using conventional teaching methods. This is further reinforced by research conducted by Lubis & Motlan (2021), stating that the improvement in student learning outcomes taught with the guided inquiry teaching model is due to the process of learning, where students are required to seek and discover their own answers to the problems they want to solve.

The results of the data analysis conducted by the researcher also support the statements above. Data analysis tests indicated that the pre-test and post-test results in both the experimental

Noperanta, Pengaruh Model Inkuiri Berbantuan E-Learning Sevima Edlink Terhadap Hasil Belajar Siswa Materi Gelombang Bunyi Di Kelas XI SMA Swasta Masehi GBKP Berastagi T.P 2022/2023

104

and control classes were homogenous and normally distributed. Subsequently, hypothesis testing was performed. The pre-test data were subjected to a two-sided t-test. With a significance level of $\alpha = 0.05$, the results of the two-sided t-test indicated that $t_{calculated} < t_{table}$ (0.462 < 1.997).

This result suggests the acceptance of the null hypothesis (H_0), indicating that the control and experimental classes had the same initial abilities. Next, the post-test data were subjected to a one-sided t-test. The results of the test showed that $t_{calculated} > t_{table}$ (2.286 > 1.669). Therefore, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_a) was accepted. In other words, there is a significant influence of using the guided inquiry teaching model assisted by Sevima Edlink e-learning on student learning outcomes in the topic of sound waves at of Masehi High School, GBKP Berastagi for the academic year 2022/2023.

The difference in learning outcomes is attributed to the influence of the guided inquiry teaching model assisted by Sevima Edlink e-learning on student learning outcomes. The application of the guided inquiry teaching model requires students to actively explore and find ways to solve problems through activities such as observation, measurement, and data collection, leading them to draw conclusions. This is consistent with the research of Novianti & Simanjuntak (2018). The guided inquiry teaching model can also motivate students to learn by giving them the opportunity to construct their own meanings and develop deeper understanding. In guided inquiry, students play a central role in learning. The teacher acts as a facilitator and does not serve as the primary source of knowledge; instead, students acquire concepts through their own research and problem-solving, allowing the desired learning concepts to become ingrained in their memory. This aligns with the viewpoint of Sukma et al. (2016), who stated that guided inquiry learning can develop scientific thinking skills, where students are placed in the role of learners in solving problems and acquiring investigative knowledge, thus understanding scientific concepts. Such a learning approach enables students to remember what they have discovered in their learning, leading to more meaningful knowledge acquisition. On the other hand, in the control class, the level of student engagement is low, resulting in students feeling bored and easily forgetting the content taught by the teacher. The data obtained illustrates that the difference in student learning outcomes in the experimental class is larger compared to the control class (Sianturi & Motlan, 2022).

The results of this study align with previous research on the guided inquiry model. A study by Dewi (2019) conducted in Class X of Darusalam Private High School concluded that student learning outcomes using an inquiry-based e-learning model, Edmodo, exhibited improvement compared to conventional teaching methods. Lovisia (2018) conducted research in Class XI of

SMAN 6 Lubuklinggau and concluded that student learning outcomes using the guided inquiry teaching model were higher compared to those using conventional teaching methods. Nurmayani et al. (2018) conducted research in Class XI of SMAN 6 Mataram and concluded that using the guided inquiry teaching model led to an improvement in student learning outcomes. The average pre-test and post-test scores for the experimental class were 49.09 and 74.47, respectively, while the average pre-test and post-test scores for the control class were 46.09 and 66.74, respectively.

The success of the guided inquiry teaching model, aided by Sevima Edlink e-learning, lies in its ability to capture students' attention and enhance their learning outcomes in the classroom. Additionally, learners have the opportunity to collaborate within groups through guided inquiry learning. Therefore, the guided inquiry teaching model can assist teachers in enhancing students' critical thinking and problem-solving skills. Students can also have a more engaging learning experience, making the subject matter more comprehensible (Amijaya, 2018). Guided inquiry learning can also foster students' curiosity, leading them to become more interested and active in asking questions to the teacher and participating in group discussions.

By implementing the guided inquiry teaching model assisted by instructional videos, student learning outcomes and engagement can be enhanced. However, the researcher encountered several challenges during the learning process, such as students not taking the practical activities seriously due to larger group sizes, resulting in some disturbances. To address this issue, a possible solution is to limit each group to only 3-4 members, and the researcher should closely supervise each group to ensure that all students can conduct their experiments in a conducive environment.

CONCLUSION

Based on the research findings obtained from data analysis and hypothesis testing, it can be concluded that there is a significant influence of the guided inquiry teaching model assisted by Sevima Edlink e-learning on student learning outcomes in the topic of sound waves in Class XI of Masehi High School, GBKP Berastagi.

new life adventure.

In writing this journal, I realized that there must be meritorious people in writing this journal, I would like to thank the thesis supervisor, previous high school researchers, thesis supervisors, friends, friends, and my parents who I love. May all the good you have done return to your person.

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