JURNAL ILMU PENDIDIKAN INDONESIA
Website:http://ejournal.uncen.ac.id/index.php/JIPI
Jurnal Terakreditasi Nasional, Keputusan, No 225/E/KPT/2022

Jurnal **Ilmu Pendidikan Indonesia**

Vol 13, No 1, Pages 25 – 44 February 2025
P – ISSN 2338-3402, E-ISSN 2623-226X

THE EFFECT OF THE GUIDED INQUIRY LEARNING MODEL ON STUDENT LEARNING OUTCOMES ON PLANT STRUCTURE AND FUNCTION MATERIAL IN GRADE VIII SMP NEGERI 12 MEDAN

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Abstract: The guided inquiry learning model is one of the learning models that can improve student learning outcomes and student learning activities which is a learning model where teachers and students determine and formulate problems together, and students actively seek and find answers and draw their own conclusions. The purpose of the study was to determine the results of science learning on the material of Plant Structure and Function of class VIII students of SMP Negeri 12 Medan. To determine the Effect of the Guided Inquiry Learning Model on Student Learning Outcomes on the Material of Plant Structure and Function in Class VIII SMP Negeri 12 Medan. This research method uses a quantitative research method. The form of research is Quasi Experimental Design. The research design is a two group design. Data collection techniques were carried out using pre-research observations, interviews with Class VIII science teachers, conducting written tests on students in the form of questions, non-tests or questionnaires, observing student activities, and documentation in the form of research images and photos and value documents related to the results. Data analysis using hypothesis testing (one-sided t-test) and N-Gain testing. Based on the results of the t-test, the obtained t-value is 4.66> t-table 2.00. This means that the results of the hypothesis test t-count are greater than t-table. Next, based on the results of the N-gain test, the increase in learning outcomes in the control class was higher, namely 69% compared to the increase in student learning outcomes of 52%. So that the Guided Inquiry Learning Model applied to the experimental class in this study has an effect on student learning outcomes in the material on the Structure and Function of Plants in class VIII of SMP Negeri 12 Medan.

Keywords: Learning Outcomes, Learning Activities, Guided Inquiry Learning Model, Structure and Function of Plants

1. INTRODUCTION

One of the most important components in human life is education Along with globalization, human resources are needed with high intelligence, knowledge, and thinking skills, including teachers, who play an important role in producing competitive students. Education is also a determining factor in the quality of life of a country, and education is provided by qualified teachers. Education is an opportunity for the development of students' will, capacity, ability, and

potential (Faizah and Kamal, 2024). Education is an activity to optimize the development of students' potential, skills, and personal characteristics (Silaban et al., 2020).

The success of education in schools can be monitored from the learning outcomes that have been achieved by students through an assessment that aims to find out the learning outcomes obtained by students after the learning process is implemented. Information and knowledge can be obtained from various sources without having to know its accuracy. This has an influence on life values, including religious values, socio-cultural values, and educational values (Sirait et al., 2020). Learning outcomes are changes in behavior in students, which can be observed and measured in the form of changes in knowledge, attitudes and skills. Learning outcomes are used to determine the effectiveness of the learning carried out, as well as used as a basis for carrying out evaluations and as a reference for the achievement of learning objectives (Yasmini, 2022).

The results of observations at SMP Negeri 12 Medan on October 31, 2023, obtained information that there are several problems in the science learning process, namely during teaching and learning activities in the classroom, students who are active in learning only smart students, students who pay attention to the teacher when the material being taught is the material they like, the next is the lack of interest of students in science lessons, especially in the material on the structure and function of plants and learning outcomes students are classified as quite low, lack of attention and enthusiasm of students in the teaching and learning process and student learning outcomes are still below the KKTP implemented by the school, which is 75. In addition to boring learning, the lack of use of laboratory equipment to support learning activities can cause students to lack knowledge about laboratory equipment with concepts in learning materials, because they do not have the ability to do so as a result of which students lack direct experience of learning with laboratory equipment, and instead only see pictures of laboratory equipment through the internet.

Related to the above problems, it is necessary to make improvements in the learning process. One way that can be done is by implementing an innovative learning model. The researcher tries to apply a learning model that can contribute to efforts to improve the science process, namely the guided inquiry learning model. The reason for using the guided inquiry learning model is because this learning model can actively encourage students to explore their own knowledge so that students are skilled in solving problems based on the information and knowledge obtained and the use of this learning model emphasizes the learning process based on students' experiences and learning interests. An interest in reading is not born just in a person, but an interest in reading must be

fostered from an early age. Fostering students' interest in reading is better done at an early age. Digital technology can be a bridge to improve student literacy (Alexander et al., 2024). The learning stage using this model begins by presenting questions or asking problems, then continues by making hypotheses where the teacher gives students the opportunity to express opinions to build a hypothesis, then the teacher guides students to design experiments, students conduct experiments to obtain information to collect data which will then be analyzed and conclusions drawn (Amrina and Lena, 2021).

The guided inquiry model allows students to master scientific concepts and is also trained to research a problem with existing facts, where students carry out scientific procedures used to identify problems, ask questions, conduct investigation procedures to obtain solutions or answers. The guided inquiry learning model is part of learning with discovery, where students are encouraged to be actively involved in learning with concepts and principles, so the guided inquiry method is very appropriate to train 6 students' creative thinking on the material of the respiratory system in humans. Students are expected not only to tell science, but also to do science (Zulianda dkk, 2021).

Based on this, the researcher is interested in conducting a research with the research title The Influence of the Guided Inquiry Learning Model on Student Learning Outcomes on Plant Structure and Function Materials in Class VIII SMP Negeri 12 Medan. There are 2 problems, the first is whether there is an influence of the Guided Inquiry Model on student learning outcomes on plant structure and function materials. Second, whether there is an influence of the Guided Inquiry Model on student learning activities on plant structure and function materials.

1. Guided Inquiry Learning Model

The inquiry learning model is a well-known learning model. In English, "inquiry" means to inquire or investigate. Research is a common process that people use to find and understand information. Inquiry learning is a series of learning activities that focus on answering questions. The main goal of learning through inquiry strategies is for students to develop intellectual discipline and thinking skills by asking questions and answering their own curiosity.

The focus of the inquiry-based learning process is on the ability of students to understand the problems presented, identify them carefully and thoroughly, and ultimately provide answers and solutions to them. At first glance, this model seems like a problem-solving model, when in fact it is not. Focus

Inquiry-based learning is not on the solutions or answers given, but on the process of mapping problems and the depth of understanding of problems so as to produce valid and convincing solutions and answers. Students can not only answer, but also understand, why and how, in addition, inquiry-based learning aims to encourage students to be more courageous, creative, and imaginative (Amrina & Lena, 2021).

The learning stages used adapt from the inquiry learning stages (Kuhlthau, et al. 2012). The stages of guided inquiry learning are as follows:

1. Open is the opening for an investigation, the beginning of the investigation process. Open is a different and important phase of the process that determines the tone and direction of the investigation. The main goal is to open students' minds and stimulate their curiosity.
2. The immersive, guided inquiry phase builds a background of shared knowledge through immersive experiences. The learning team designs interesting ways for students to immerse themselves in the whole idea of the content area being studied, for example reading a book, story or article together; watching a video.
3. In the exploration phase of Guided Inquiry, students browse through various sources of information to explore interesting ideas and prepare themselves to develop their inquiry questions, in this critical early phase of building new learning, students need to explore ideas rather than gather facts.
4. The main task of this stage is for students to construct inquiry questions from interesting ideas, pressing issues, and emerging themes that they have explored from various sources of information.
5. Gather is gathering important information broadly into the depths. Clearly articulated questions provide direction for the Gather phase.
6. Create works Once students have gathered enough information to build their own understanding, they are ready to organize their learning into creative presentations during the Create phase creating a way to communicate what they have learned about their investigation helps students to articulate what is important about the subject and requires them to further integrate decisively into a deep understanding
7. Share is the culmination phase of the inquiry process when students share the products they have created to demonstrate what they have learned to other students in their inquiry community.

8. The Evaluation phase, which occurs at the end of the inquiry process, is an important component of guided inquiry, although guided inquiry includes assessments to determine student progress throughout the phases of the inquiry process, evaluation also occurs at the end when the learning team evaluates the achievement of the student's learning objectives.

There are several principles that must be considered when deciding on the use of research models in learning. Some of these principles are (Featured in 2023):

1. Aim for intellectual development
2. Principle of interaction
3. Principle of questioning
4. Principles of learning to think
5. Open principle

The main characteristics of inquiry-based learning are:

1. During the investigation, the focus is on maximum activity in student exploration and discovery. Students not only become recipients of lessons through the teacher's oral explanations during the learning process, but also play a role in discovering the essence of the lesson itself.
2. All student activities are aimed at finding and finding answers and questions on their own, therefore aimed at fostering a confident attitude (independent learning). The research-based learning method represents teachers not only as a source of learning but also as a mediator and motivator of student learning.
3. The purpose of inquiry learning is to develop systematic, logical and critical intellectual thinking or competence as part of the mental process. Students not only need to master the topics of the exam method, but also learn to use their skills to the best of their ability.

According to Shoimin, (2014: 86-87) argues that the advantages and disadvantages of inquiry learning are as follows:

1. The advantages of guided inquiry learning are:
   a. This learning model uses knowledge that is very relevant to an observed news
   b. This learning model allows students to compare content in a more realistic and positive way
   c. Imterinsically, this model is very motivating for students
   d. Thanks to this model, the relationship between teachers and students is warmer, because teachers play more of a role as a facilitator of learning and direct activities controlled by teachers.

e. This model conveys superior transfer value when compared to other models.

2. The advantages of guided inquiry learning are:
   a. This model requires more lesson hours and is also outside the classroom compared to other learning models.
   b. This model requires a mental process that is not synchronized, similar to an analytical and cognitive device.
   c. Students prefer the traditional chapter-by-chapter approach.
   d. This approach is difficult using traditional presentation tests.

2. Learning Outcomes

Learning outcomes are skills that students have after going through a learning experience. Learning outcomes are skills that students have after gaining experience in the learning process. Learning outcomes are used by teachers as a measure or standard for achieving educational goals and are shown by the test results received by teachers after completing the learning material of a subject. On the other hand, Winkel interprets learning outcomes as changes that cause changes in people's attitudes and behaviors (Yasmini, 2022)

Learning is the result of the interaction between learning and teaching activities. It can be concluded that learning outcomes represent students' performance and abilities after undergoing a learning experience. Learning outcomes are an evaluation of 16 pedagogical aspects of student development and progress in obtaining the values contained in the materials and curriculum presented to them (Nurlina et al., 2015)

Learning outcomes are classified into three domains or domains according to Blom's taxonomy: (1) cognitive domains, (2) affective domains, and (3) psychomotor domains (motor skills domains). The affective realm refers to attitudes that consist of five dimensions: beliefs, reactions, organizational evaluations, and internalization. The psychomotor realm is associated with learning outcomes and behavioral skills.

The diverse student experience includes cognitive, affective, and psychomotor fields. Learning outcomes play an important role in the learning process because they provide information to teachers about student progress. towards learning goals through teaching and further learning activities (Ropii & Fahrurrozi, 2017).

a. Cognitive learning outcomes are behavioral changes that occur in the cognitive region. Bloom hierarchically divides and arranges the levels of cognitive learning outcomes ranging from the

lowest and simplest to the highest and most complex. The cognitive domain refers to intellectual learning outcomes and consists of six aspects: knowledge, understanding, application, analysis, evaluation, and creation.

b. The affective domain refers to behavior that consists of five dimensions: acceptance, response or reaction, evaluation, organization and interaction (Djamaluddin & Wardana, 2019). Krathwohl (1961) categorized affective learning outcomes into five levels: acceptance, participation, evaluation, organizing, and internalization.
c. The Skill Domain is associated with learning and behavioral outcomes. There are six aspects in the realm of skills, namely movement, reflexes, basic movement skills, perceptual skills, coordination or coherence, complex skill movements, and expressive and interpretive movements.

Factors that affect learning outcomes can be divided into two categories: (1) Internal factors, these factors are factors that affect students from within, consisting of physical factors (physiological) and psychological factors. (2) External factors, namely factors that come from outside the student or commonly referred to as environmental factors, which consist of home environmental factors, school environmental factors, and community environmental factors (Baso et al., 2022).

3. Student Learning Activities

Learning activities are all student activities in the learning process and their forms vary, ranging from physical activities that are easy to observe to psychological activities that are difficult to observe, while reading, listening, writing, doing, and measuring are classified as physical activities, while psychological activities include remembering the content of learning materials from previous meetings and using existing knowledge to solve problems, namely solving problems, completing the results of the experiment, and comparing concepts with different concepts (Sunita Siskawati Pane, 2024).

The types of student learning activities intended include various types of learning activities themselves, consisting of:

a. Visual activities, for example: Verbal activities, for example: Presenting, creating, asking questions, proposing, expressing opinions, conducting interviews, discussing, interrupting.
b. Listening activities, such as listening: explanations of conversations, discussions, music, and speeches.

c. Examples of writing activities: Writing and copying stories, essays, reports, and surveys.
d. Examples of drawing activities: Drawing, creating charts, maps, diagrams
e. Examples of motor activities: doing experiments, modeling, repairing, playing, gardening, raising livestock
f. Mental activities, for example, thinking, remembering, solving problems, analyzing, recognizing relationships, making decisions.
g. Examples of emotional activity: interested, bored, happy, excited, excited, calm, nervous.

Plant Structure and Function Materials

Plants have a complex structure and function to maintain their survival. Roots are one of the plant structures that function as food storage, water and mineral absorption, and as a support for plants. Roots consist of root hairs, root bark, and transport tissues (xylem and phloem) (Campbell et al., 2008)

The stem is a plant structure that functions as a support for plants, a place to transport water and minerals, and as a place to store food. The stem is made up of the epidermis, cortex, and transport tissues (xylem and phloem). Leaves are plant structures that serve as sites for photosynthesis, carbon dioxide absorption, and oxygen release. The leaves are composed of the epidermis, mesophyll, and transport tissues (xylem and phloem).

The main function of plants is to carry out photosynthesis, which is the process of converting light energy into chemical energy in the form of glucose. In addition, plants also carry out transpiration, which is the process of releasing water in the form of water vapor through the leaves. Plants also carry out the absorption of water and minerals from the soil through the roots, as well as the storage of food in the form of carbohydrates, proteins, and fats.

Plant tissue consists of meristematic, parenchyma, colony, and sclerenchyma tissues. Meristematic tissue is a tissue consisting of cells that actively divide and play a role in the growth and development of plants. The parenchyma tissue is a tissue made up of cells that serve as a storage place for food and water. The plant transport system consists of xylem and phloem. Xylem is a transportation system that functions to transport water and minerals from roots to leaves. Phloem is a transportation system that functions to transport photosynthetic products from leaves to all parts of the plant (Raven et al., 2002).

2. RESEARCH METHODS

The design of this study was carried out using a quantitative method. According to Sugiono (2013:13), research data in a quantitative approach is in the form of numbers and analyzed using statistics. The form of this research is Quasi Experimental Design. The research design is a two group design, this design uses pretest and posttest. And this design consists of an experimental class and a control class.

According to Sugiono (2016:80) population is a generalization area consisting of: objects/subjects that have certain qualities and characteristics that are determined by the researcher to study and then draw conclusions. The population in this study is all students of class VIII-1, VIII-2, VIII-3, VIII4, VIII-5, VIII-6, VIII-7, VIII-8, VIII-9 at SMP Negeri 12 Medan for the 2024/2025 academic year.

According to Sugiono (2016: 81) sapel is part of the number and characteristics possessed by the population. The samoel collection technique uses Purposive Sampling, which is a sample determination technique with certain considerations. The sample in this study is all students of class VIII-1 as an experimental class of 32 students and class VIII-2 as a control class of 32.

3. RESULTS AND DISCUSSION

Science Learning Outcomes on Plant Structure and Function material for Grade VIII students of SMP Negeri 12 Medan.

The results of the research that has been carried out in the experimental class obtained data on the results of the Pretest and posttest at the first and fourth meetings in grade VIII of SMP Negeri 12 Medan. The learning results of the pretest and posttest of the experimental class can be seen in Table 1.

Table 1. Average, Standard Deviation, and Variance of Pretest and Postest Data of Experimental Classes

Data Source	Amount of data	Average Score	Standard deviation	Variance
Pretest	32	44.44	6.64	44.18
Posttest	32	83.06	8.65	74.83

As can be seen from the table above, the average pretest and posttest scores of the experimental class are 44.44 and 83.06. This shows that there is an increase in student learning

outcomes after learning using the guided inquiry learning model.

As for the learning outcomes of students who are taught with the conventional learning model on plant structure and function materials, it can be seen in the diagram below (Figure 1):

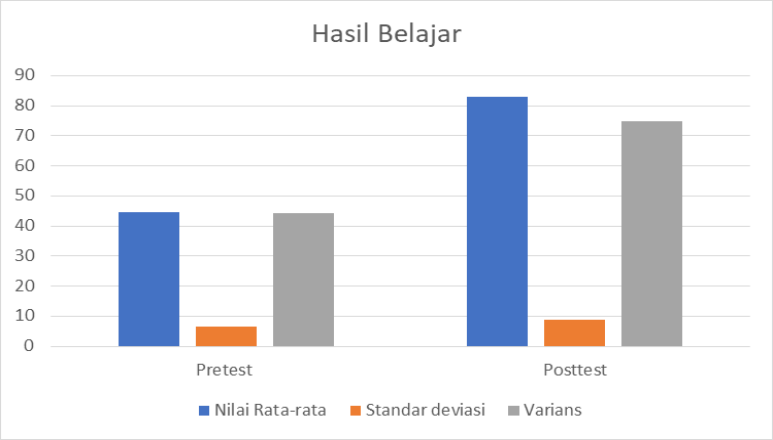

Figure 1. Learning outcomes of the Experiment class

The figure 1. above shows a diagram of student learning outcomes learned using a guided inquiry learning model on plant structure and function materials. From the diagram above, it can be seen that the difference in student learning outcomes between the pretest is at a score of 44.44 and the posttest score is at a score of 83.06. To see the learning outcomes of the control class students specifically, you can see the Table 2 below.

Table 2. Average, Standard Deviation, and Variance of Pretest and Postest Experimental Classes

Data Source	Amount of data	Average Score	Standard deviation	Varians
Pretest	32	45.41	6.01	37.34
Posttest	32	74.22	6.27	40.62

It can be seen from the table above that the average pretest and posttest scores of the control class are 45.41 and 74.22. This shows that there is an increase in student learning outcomes after learning using the Conventional learning model.

As for the learning outcomes of students who are taught with the conventional learning model on plant structure and function materials, it can be seen in the diagram Figure 2 below:

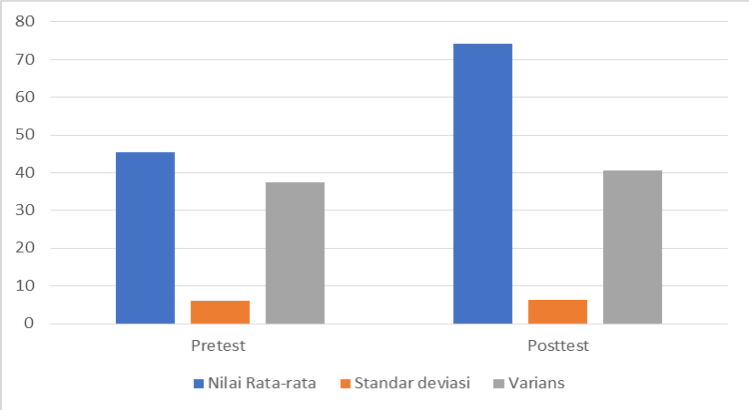

Figure 2. Learning outcomes of the control class

The figure 2. above shows a diagram of student learning outcomes learned using a guided inquiry learning model on plant structure and function materials. From the diagram above, it can be seen that the difference in student learning outcomes between the pretest is at a score of 45.41 and the posttest score is at a score of 74.22.

1. Normality Test

The normality test was carried out to find out whether the data obtained by both the pre-test and post-test were normally distributed or not. In this study, the normality test used was the chi-squared test (X2) at the level of α= 0.05. The data is normally distributed if the price of Chi Squared (X2) is calculated < the price of Chi Squared (X2) of the Table 3.

Table 3. Normality Test Results of Pretest and Posttest Results of Experimental Classes

Class	X2Count	X2table	A	El Caption
Eksperimen	10.12	11.07	0.05	Normal
Control	8.31	11.07	0.05	Normal

Based on the table 3. above, it shows that the initial data has a calculated X2 of 10.26 which is smaller than the table X2 value of 11.07. Similarly, the post-test data had a calculated X2 value of 8.22 which was also smaller than the table X2 value of 11.07. Therefore, it can be concluded that the test results before and after in this study are normal distribution with a significance level of 0.05 (Table 4).

Table 4. Data Normality Test Results of Pretest and Posttest Control Class

Data	X2Count	X2table	A	Information
Pretest	10.26	11.07	0.05	Normal
Posttest	8.22	11.07	0.05	Normal

Based on the table 4. of normality test results, it is known that the pretest data has the criteria of X2 count < X2 table (10.26 < 11.07) and the posttest data has the criteria of X2 count < X2 table (8.22 < 11.7). So it can be concluded that the pretest and posttest data in this study are normally distributed at a significance level of 0.05.

2. Learning Outcome Homogeneity Test

The homogeneity test was carried out to find out whether two data from different samples were homogeneous, which could be done by comparing the variance between the two data (Table 5).

Table 5. Homogeneity Test of Learning Outcomes

Class	S2	Fcal	Table	Information
Eksperimen	0.04	0.59	1.82	Homogeneous
Control	0.81	0.92	1.82	Homogeneous

Based on table 5. on the data on the improvement of learning outcomes, Fcal < Ftabel was obtained, where based on this table for the distribution of F with a real level of $\alpha = 0.05$ and a numerator of 31 (n-1 = 32-1) and a denominator F (31.31) were obtained that in the experimental class Ftabel = 0.92 and Fcal = 0.59 so that Fcal < Ftabel = 0.59 < 1.82. The data in the control class $F_{table} = 0.82$ and Fcal = 1, so Fcal < Ftabel = 0.92 < 1.82, then the data is homogeneous.

3. n-gain Test (Learning Improvement Test)

The purpose of this study is to conduct n-gain analysis to measure the improvement of student performance in learning by comparing the scores of the pretest and posttest of students in the experimental class and the control class. Based on the results of the N-gain test, there was an increase in student learning outcomes in both the experimental class and the control class. In the experimental class, there was an increase (Table 6) in student learning outcomes by 0.69 (69%). In the control class, there was an increase (Table 7) in student learning outcomes by 0.52 (52%) and n-Gain (Figure 3).

Table 6. Calculation of n-Gain of Experimental Class

Pretest	Posttest	N	n-Gain	n-Gain interpretation
44.44	83.06	32	0.69	Keep

Table 7. Control Class N-Gain Calculation

Pretest	Posttest	N	n-Gain	n-Gain interpretation
45.41	74.22	32	0.52	Keep

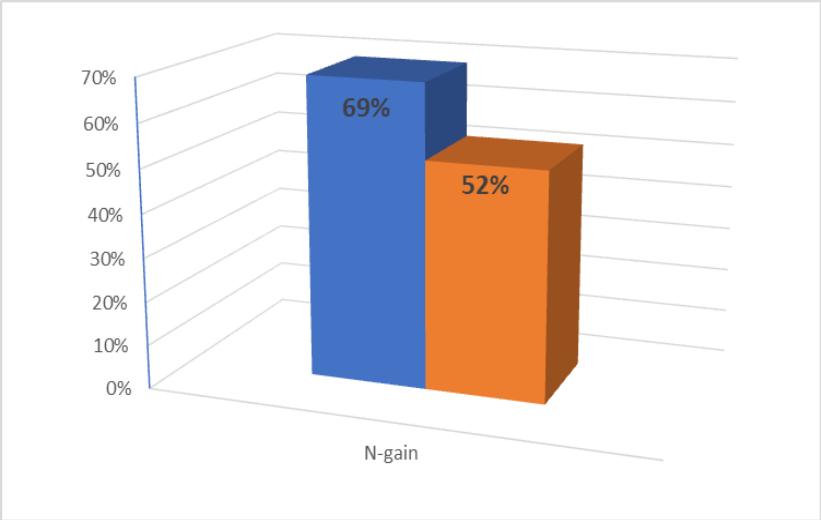

Figure 3. Graph of Learning Outcomes Improvement

From the graph in figure 3. it can be seen that there is a difference in the learning outcomes of students who are taught with the guided inquiry learning model on the improvement of student learning outcomes with plant structure and function materials. The guided inquiry learning model had an increase in learning of 69% while in the control class there was an increase in learning of 52%.

4. Test the Learning Outcome Hypothesis

After the normality and homogeneity distribution data are known, a hypothesis test is carried out using a statistical test, namely the one-sided t-test, namely the right-side t-test. This test is to find out whether the hypothesis in this study is accepted or rejected. The test criteria are if the tcount > ttable the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected and if

the tcount ≤ ttable then Ho is accepted. The data of the hypothesis test results can be seen in Table 8 below:

Table 8. Hypothesis Test Results

Class Data		**Calculation**	**t_{table}**	**Information**
Eksperimen	Control	4.66	2.00	H_0 rejected and Ha accepted
$\overline{X}$= 83.06 S = 8.65 S2 = 74.83	$\overline{X}$= 74.22 S = 6.37 S2= 40.83			

From (Table 8) the results of the calculation of the table above, it is known that tcount = 4.66 and ttable = 1.99 where tcount > table, so that Ha is accepted and Ho is rejected. Therefore, it can be concluded that there is an influence of the Guided Inquiry learning model on student learning outcomes on plant structure and function materials.

Based on the results of this study, by applying a guided inquiry learning model and a conventional learning model to plant structure and function materials. With the information that the experimental class is taught using a guided inquiry model and the control class is taught using a conventional learning model. The results obtained showed that the learning outcomes of students in the experimental class based on the results of the posttest were 83.1.

This shows that the learning outcomes of students who are taught using the guided inquiry learning model are higher than the learning outcomes of students who are taught using the conventional learning model. There was an increase in student learning outcomes learned with the guided inquiry model of 69%, which was higher when compared to the increase in student learning outcomes learned using the conventional learning model, which was 52%. Based on the research that has been conducted, the difference in student learning outcomes learned with the guided inquiry learning model and the conventional learning model is caused by several things.

In this study, learning carried out using the guided inquiry learning model has better results when compared to those using the conventional learning model. This can be due to the learning conditions in the experimental class that are taught using the guided inquiry learning model are more conducive and regular when compared to the control class that is taught using the conventional learning model. Learning conditions are one thing that is very influential in achieving learning goals.

Poor learning conditions can make students less focused in listening to the teacher's

explanation and can lead to poor student understanding of the material being taught. In addition, students who are taught using conventional learning models have become accustomed to science, still based on 80% of teachers who are looking so that students become lazier to read or seek knowledge from outside the learning process at school. Students still often have difficulties in finding their own knowledge, so it is not uncommon for there to be misconceptions related to the actual concepts obtained by students.

Student Learning Activities

The data obtained in this study is from student learning activities during the room as presented in this case during the teaching and learning process, by utilizing the learning model that has been presented. Student activity data is divided into two, namely: Observation and questionnaire distribution. Where observation is carried out by the talli method to make it easier for observers to observe, observers can follow the class plan. The second is by distributing questionnaires. When the teaching and learning process has been completed, the researcher distributed a questionnaire in the form of 20 questions. Each activity was repeated 2 times in the study.

1. Student Learning Activity Questionnaire (Figure 4).

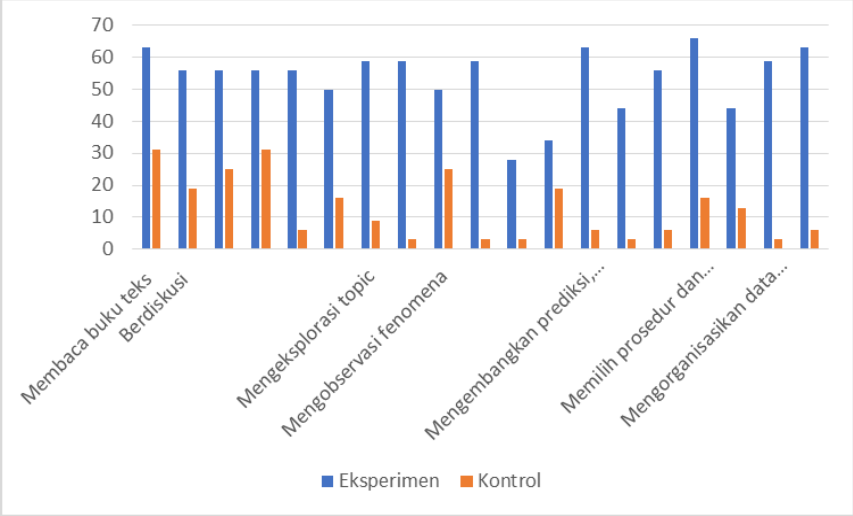

Figure 4. Questionnaire Diagram of Experiment and Control Class

The data obtained (Figure 4) in this study is from the questionnaire as presented in this case after meeting 1 and meeting 3 the learning process in two sample groups was carried out after the implementation of the learning process by utilizing the guided inquiry learning model in the experimental class and the Convention learning model in the control class. The score obtained in the experimental class was 83.94%. Meeting 1 of the experimental class questionnaire was distributed to 57.85%, then in the third meeting the questionnaire was distributed to students, the

result was 83.94%.

The score obtained in the control class was 57.85%. Meeting 1 of the experimental class questionnaire was spread out to 52.36%, then in the third meeting the questionnaire was distributed to students, the result was 57.85%.

Average Score of Student Learning Activities

Meanwhile, the average value of student activity in the experimental class and the control class obtained is tabulated in the Table 9. below along with the standard deviation and variance values.

Table 9. Averages, Deviation Standards, and Variance Activity Data of Experiment and Control Class Students

Data Source	Number of Students	Average grade	Leaning Deviation	Variance
Experimental Classes	32	67.31	9.26	85.83
Control Classes	32	46.228	4.03	16.27

Hypothesis Test of Student Learning Activity Questionnaire

After it is known that the data is distributed normally and is also homogeneous, so that hypothesis tests can be carried out using statistical analysis, especially one-party t-tests. This test is used to determine whether the proposed theory underlying this research is accepted or rejected. ata for hypothesis testing can be seen in the following Table 10:

Table 10. Results of Student Learning Activity Data Hypothesis Test

Class Data	Calculation	ttable	Information
Eksperimen $\bar{x}$ = 67.31 S = 9.26 S2 = 85.83	11.77	1.99	Hell is a divine, it's going to be
Control $\bar{x}$ = 46.28 S = 4.03 S2 = 16.27			

Based on Table 10. the t-value distribution table, the ttable value is set at 1.99. However, through calculations, a tcal value of 11.77 was obtained. This shows that the null hypothesis (Ho) is rejected while the alternative hypothesis (Ha) is accepted. Because of this study, it can be concluded that there are differences in student activities learned using the guided inquiry model and in the structure and function of plants.

Observation of Students' Learning Activities

Comparison of Observation of Learning Activities of Experimental and Control Class Students.

In this study, the difference in student learning activity observation scores between two groups, in this case the experimental class and the control class with scores of 90.67 and 88.63, indicates that there is a difference in the level of activity in the learning process in appendix 22. Let's examine further:

a. **Score Difference**: The difference in learning activity scores between the two classes was 2.04 (90.67 - 88.63).
b. **Interpretation**: This difference shows that in general, students in the experimental class with a score of 90.67 show a slightly higher level of learning activity compared to students in the dick class with a score of 88.63.

These differences can be influenced by a variety of factors, including:

1. Learning Methods:

   Classes with a score of 90.67 apply a more innovative and interactive learning guided inquiry learning model, such as group discussions, case studies, or collaborative projects. This method encourages students to participate more actively in learning. Meanwhile, the class with a score of 88.63 uses conventional model learning.

2. Student Motivation and Engagement:

   Students in the experimental class with a score of 90.67 may have higher levels of motivation and interest in the learning material. This can encourage them to be more active in asking questions, discussing, and seeking additional information. In contrast, students in the control class with a score of 88.63 may be less motivated or less engaged in the learning process.

   Based on the results of this study, the results were obtained that both in the experimental class which was taught using the guided inquiry learning model and the control class which was taught using the conventional learning model had a conclusion that the learning activities of

students both in the form of questionnaires and in the form of observation of the experimental class had a lot of improvement compared to the control class, because basically the learning model in the experimental class was Guided inquiry learning where students are required to be active in groups, actively discuss and actively experiment. (Tiurlina Siregar. et. al, 2021) It is different from conventional learning where there is still more learning from teachers.

4. CONCLUSIONS AND SUGGESTIONS

CONCLUSIONS

Student learning outcomes and activities on plant structure and function materials learned using the guided inquiry model are higher than conventional

SUGGESTION

In teaching in the classroom using a guided inquiry model, we must be able to organize students and time. Because this model has a fairly long learning time and can make students bored and play games in learning.

5. ACKNOWLEDGMENTS

Thank you to the Rector of Medan State University and his staff. Thank you to the Dean of the Faculty of Mathematics and Natural Sciences, Medan State University and his staff. Thank you to the Head of the Department and the Secretary of the Department and their staff. Thank you to the head of the study program and her staff. Thank you to the Principal of SMP Negeri 12 Medan and the Science Study Teacher who has given permission to carry out the research.

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