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The Effect of the Guided Inquiry Learning Model on the Learning Outcomes of Grade VII Students in Biology at SMP Negeri 6 Tondano

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Abstract. *This study seeks to evaluate the impact of the guided inquiry learning paradigm on the academic performance of seventh-grade students in biology at SMP Negeri 6 Tondano. This research used a quasi-experimental approach utilising a non-equivalent control group design. The study sample comprised class VII A with 25 students and class VII B with 25 students. This study's variables include the independent variable (X), which consists of users of the guided inquiry learning model, and the dependent variable (Y), which pertains to the learning outcomes of seventh-grade students at SMP Negeri 6 Tondano. Data gathering methods encompass interviews, documentation such as activity reports and pertinent data, and written assessments, including multiple-choice examinations. The hypothesis test employed to assess the difference in student learning outcomes between the experimental and control groups utilises the t-test. The mean post-test learning results for Class VII B students (experimental group) utilising guided inquiry is 82.6. In contrast, the mean outcomes for Class VII A students (control group) employing direct instruction is 77. The hypothesis test findings indicate a t-test value of 2.826, which exceeds the t-table value of 2.010 at a significance level of 0.05. According to the criteria for hypothesis testing, H0 is rejected, and H1 is approved. Consequently, it can be inferred that the guided inquiry learning model positively impacts the learning results of Class VII students in biology at SMP Negeri 6 Tondano.*

Keywords: *Learning Model, Guided Inquiry, Learning Outcomes, Biology.*

Abstrak. Penelitian ini bertujuan untuk mengevaluasi dampak model pembelajaran inkuiri terbimbing terhadap hasil belajar siswa kelas VII dalam mata pelajaran biologi di SMP Negeri 6 Tondano. Penelitian ini menggunakan pendekatan kuasi eksperimen dengan menggunakan rancangan kelompok kontrol non-ekuivalen. Sampel penelitian terdiri dari dua kelas: kelas VII A dengan 25 siswa dan kelas VII B dengan 25 siswa. Variabel penelitian ini meliputi variabel bebas (X), yang terdiri dari pengguna model pembelajaran inkuiri terbimbing, dan variabel terikat (Y), yang berkaitan dengan hasil belajar siswa kelas VII di SMP Negeri 6 Tondano. Metode pengumpulan data meliputi wawancara, dokumentasi seperti laporan kegiatan dan data terkait, dan penilaian tertulis termasuk ujian pilihan ganda. Uji hipotesis yang digunakan untuk menilai perbedaan hasil belajar siswa antara kelompok eksperimen dan kelompok kontrol menggunakan uji-t. Rata-rata hasil belajar post-test siswa kelas VII B (kelompok eksperimen) yang menggunakan model pembelajaran inkuiri terbimbing adalah 82,6, sedangkan rata-rata hasil belajar siswa kelas VII A (kelompok kontrol) yang menggunakan pembelajaran langsung adalah 77. Hasil uji hipotesis menunjukkan nilai t-hitung sebesar 2,826 yang melebihi nilai t-tabel sebesar 2,010 pada taraf signifikansi 0,05. Berdasarkan kriteria pengujian hipotesis, H0 ditolak dan H1 diterima. Dengan demikian, dapat disimpulkan bahwa model pembelajaran inkuiri terbimbing berpengaruh positif terhadap hasil belajar biologi siswa kelas VII SMP Negeri 6 Tondano.

Kata kunci: Model Pembelajaran, Inkuiri Terbimbing, Hasil Belajar, Biologi.

1. INTRODUCTION

The learning process in Indonesia is still largely teacher-centred. Teachers have many activities, and students only accept the knowledge conveyed by the teacher. This is not in accordance with the nature of students as learning subjects. The learning carried out must be student-centred (student-centred) so that students are actively involved in the learning process. Student-centred learning must be applied to all learning materials, especially in science subject

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matter whose learning object is natural (Ibrahim, 2014; Valerius et al., 2023). SMP Negeri 6 Tondano is one of the schools that has implemented the Independent Learning Curriculum for the 2022/2023 school year. This curriculum is only applied to grade VII. Researchers at SMP Negeri 6 Tondano have made initial observations for the 2023/2024 school year to find out the biology learning process at the school.

Observations were made through observation of the teaching and learning process in the classroom, and some had reached the Minimum Completeness Criteria (KKM) with an average score of 70. Based on the results of observations made at SMP Negeri 6 Tondano, students' awareness of learning biology could be higher. Students tend to pay less attention to what is conveyed by the teacher, so during the discussion, students need help understanding what material is being discussed and tend to play on cell phones. The low awareness of students' learning causes students to be lazy in doing assignments and homework from teachers, which has an impact on low learning outcomes (Bachman, 2005; Ambasari, 2012; Anggraini et al., 2020).

The purpose of biology learning is for students to be able to understand, find and explain concepts and principles in biology (Hamalik, 2001; Erlina, 2011; Dimayati & Mudjiono, 2015). For the biology learning process, strategies, various approaches, methods, and media, so that students are more active in learning and understand the concepts and principles of biology so that it is hoped that student learning outcomes will be better (Joyce, 2009; Joyce & Weil, 2018). According to the results of the observation above, a solution must be found to overcome the problem. Exemplary efforts are made to foster students' awareness and understanding of learning, namely by applying a guided inquiry learning model (Muhibbin, 2010; Raka, 2011; Mulyasa, 2014)). The guided inquiry model is one of the alternatives to overcome these problems because it is considered an effective inquiry model in the learning process (Slameto, 2003; Slameto, 2010; Sofiani, 2011). The inquiry learning model can be applied to improve the role of students during the learning process (Suprijono, 2009; Suryosubroto, 2009; Suprijono, 2011).

The inquiry learning model is learning that emphasises the active role of students in learning (Wulandari, 2008; Trianto, 2010). The main goal of inquiry learning is to develop students' attitudes and skills so that students can become independent problem solvers (Trianto, 2009; Ngalimun, 2010). Research with a guided inquiry learning model in Biology has never been conducted at SMP Negeri 6 Tondano. Based on the problems described above, the researcher tried to make one of the efforts to improve the quality of biology learning by carrying

out a study titled: "The Influence of the Guided Inquiry Learning Model on the Learning Outcomes of Grade VII Students in Biology Subjects at SMP Negeri 6 Tondano".

2. METHOD

The research site was carried out at SMP Negeri 6 Tondano, and the research time was carried out from March to April 2024. This study uses a pseudo-experimental method with a non-equivalent control group design. The sample of this study consisted of two classes, namely class VII A, with as many as 25 students, and class VII B, with as many as 25 students. The variables in this study are the independent variable (X), which is the user of the guided inquiry learning model, and the bound variable (Y), which is the learning outcome of grade VII students of SMP Negeri 6 Tondano. Data collection techniques include interviews, and documentation provides activity reports and relevant data for documentation, and written tests include multiple-choice tests. Meanwhile, the hypothesis test used to see the difference in student learning outcomes between the experimental group and the control group was using the t-test.

In the design of this study, two classes were selected: the experimental group and the control group. The pretest score was used to determine the initial equivalence of the two groups.

O1 X O2
O3 X O4

Information:

O1 : Pretest value of the group that was given treatment (experiment).

O2 : Posttest value of the group that was given the treatment (experiment).

X : Treatment with a guided inquiry learning model.

O3 : Pretest value of the group that was not given treatment (control).

O4 : Posttest value of the group that was not treated (control).

3. RESULT AND DISCUSSION

Result

The data from the research results that have been collected are in the form of quantitative data taken from two classes VII at SMP NEGERI 6 Tondano. The two classes are classes VII A and VII B, where the two classes are given different treatments. Class VII A acts as a control class that implements direct learning, while Class VII B acts as an experimental class that applies a guided inquiry learning model. The results of data analysis in the form of pretests and posttests from both classes can be shown in the table below:

Table 1. Control class data

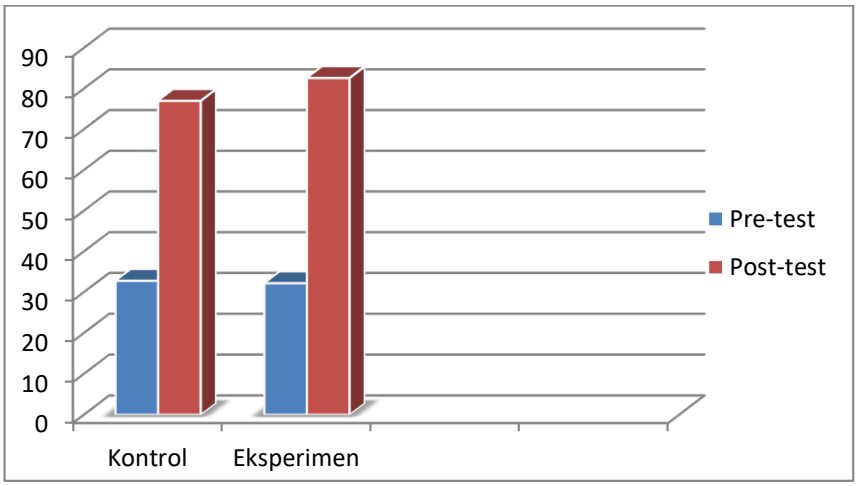
No.	Control class data		
	Statistic	Pretest	Posttest
1.	Total	805	1925
2.	Minimum Score	20	70
3.	Maximum Score	40	90
4.	Average	32,2	77
5.	Standard Deviation	5,016639	5,7735
6.	Varians	25,16667	33,333

Table 2. Experimental class data

No.	Experiment class data		
	Statistics	Pretest	Posttest
1.	Total	930	2065
2.	Minimum Score	30	70
3.	Maximum Score	55	95
4.	Average	37,2	82,6
5.	Standard Deviation	8,175166	8,051915
6.	Varians	66,83333	64,83333

The results showed that the average score of the pretest of students carried out before teaching and learning activities in the control class reached 32.8, while the average score of the pretest in the experimental class reached 32.2. The average score of the posttest in the control class reached 77. In contrast, the average score of the posttest of the experimental class reached 82.6.

The average posttest learning outcomes obtained by students in class VII B (experiment) who applied guided inquiry learning were higher than the learning outcomes of students in class VII A (control) who applied direct learning. Graph 1 clearly shows the comparison of the average scores of student learning outcomes from the experimental class and the control class.



Graph 1. Comparison of the average learning outcomes of students in the control class with the experimental class

Data Analysis Prerequisite Test

Normality Test

After the learning outcome data has been collected, the data normality test will be carried out next. This normality test is intended to find out whether the data collected is taken from a normal population or not. The normality test used in this study is the Liliefors test, which was performed using Microsoft Excel 2010. The results of the data normality test can be seen in Table 3.

Table 3. Results of Posttest Data Normality Test

Data Postest	Control Classes	Experimental Classes
N	25	25
X	77	82,6
L_{count}	0,167	0,147
L_{table}	0,173	0,173

Based on the results of the normality test of posttest data in the control class, the $L_{count} < L_{table}$ values were obtained. The L_{count} value obtained was 0.167 while the L_{table} value was 0.173, so the posttest data in the control class were usually distributed. Furthermore, the results of the normality test of posttest data in the experimental class obtained $L_{count} < L_{table}$ values. The L_{count} value obtained was 0.147, while the L_{table} value was 0.173. Thus, the posttest data in the experimental class are also normally distributed.

Homogeneity Test

After the data obtained is normally distributed, a homogeneity test is carried out to see if there are similarities between the two sample groups. The homogeneity test used in this study is the Fischer test, which uses Microsoft Excel 2010. The results of the data homogeneity test can be seen in Table 4.

Table 4. Posttest Data Homogeneity Test Results

Data Posttest	Control Classes	Experimental Classes
N	25	25
Var.s	33,33	64,83
F_{count}	1,94	
F_{table}	1,98	

Based on the results of the homogeneity test of posttest data in the control class and the experimental class with a significant level of 0.05, the value of $F_{count} < F_{table}$ was obtained. The F_{count} value obtained was 1.94, while the F_{tabel} value was 1.98. Thus, it can be concluded that both classes come from the same (homogeneous) population.

Hypothesis Test

After the prerequisite test is carried out, the next step is to test the hypothesis. This hypothesis test aims to compare the learning outcomes of students from the control group with those of the experimental group. The hypothesis test used is the T-test. The results of the data hypothesis test can be seen in Table 5.

Table 5. Posttest Data Hypothesis Test Results Based on the results of the posttest data hypothesis test in the control class and the experimental class with a significant level of 0.05, the t_{count} value > the t_{table} was obtained. The t_{count} value obtained is 2.826, while the ttable value is 2.010. In accordance with the hypothesis testing criteria, H0 is rejected, and H1 is accepted.

Discussion

The application of the Guided Inquiry learning model and the direct learning model on environmental pollution materials was carried out 2 times, with each class given pre-test questions at the beginning of the meeting and a *post-test* at the end of the meeting. The first meeting discussed soil erosion, and the second meeting discussed various types of environmental pollution. The implementation of the Guided Inquiry learning model in grade VII is as follows:

a. Initial Activities

In the early stages, the teacher greets and asks the class leader to lead a joint prayer before the learning activity begins. Next, the teacher checks the students' attendance and conveys the learning objectives. Students are divided into four groups; each group has four members and is given a guided inquiry-based Student Worksheet (LKS). As a perception, the teacher showed pictures related to soil erosion to explore students' curiosity.

b. Core Activities

At this stage, the teacher asks students questions about the material they are learning, namely soil erosion and environmental pollution. In the next stage, with guidance from the teacher, students formulate hypotheses on the questions given. Students collect data from various sources to prove the hypothesis that has been made, then discuss it according to a predetermined group to test the hypothesis made. During the discussion, the teacher provided necessary assistance to students who had difficulties in working on the questions in the LKS. Furthermore, in the hypothesis test stage, students test the hypothesis by adjusting or comparing the hypothesis that has been made with data that has been obtained

from various sources. Then, the teacher asks students to conclude the results of the hypothesis test by presenting it in front of the class.

c. Final Activities

At this stage, the teacher, together with the students, deduces from the material that has been learned. Then, the teacher provides reinforcement/affirmation about the material learned and motivates students to be more active in learning. The teacher ends the learning with a joint prayer and greetings.

The learning process of biology with a guided inquiry model creates the impression that biology is one of the fun lessons. This is because, in the process of solving a problem given by the teacher, students can explore their thinking and can exchange opinions with their group friends; besides that, students can also make students understand the relationship between material and daily life. This improves learning outcomes very significantly, thereby showing that the guided inquiry model can help students better understand related concepts and solve every problem that is often encountered.

Guided inquiry model learning significantly influences student learning outcomes compared to the direct learning model. This is in line with the results of previous research by Sofiani (2011), which found that the "Guided Inquiry model can increase the average score of student learning outcomes." Learning with a guided inquiry model can develop students' thinking power so that they can understand related concepts. Conditions like this can improve student learning outcomes.

The success of improving student learning outcomes is due to the optimal learning of the guided inquiry model carried out by teachers (in this case, researchers). This model provides opportunities for students to find answers to the problems given so that students are more active and can present various arguments related to the concepts of the material. The results of this pseudo-experimental research show that the guided inquiry learning model influences the learning outcomes of grade VII students in the subject of Biology at SMP Negeri 6 Tondano.

4. CONCLUSIONS AND SUGGESTIONS

Based on the results of the research and discussion that have been described, it can be concluded that the guided inquiry learning model influences the learning outcomes of grade VII students in the subject of Biology at SMP Negeri 6 Tondano. Based on this conclusion, the researcher put forward several suggestions, including (1) For subject teachers it is expected to be able to choose the right model, method or learning strategy in accordance with the material to be taught, (2) The guided inquiry learning model is

suggested to be used in teaching and learning activities, especially in environmental pollution materials.

REFERENCES

Ambarsari, A. (2012). Penerapan pembelajaran inkuiri terbimbing terhadap keterampilan proses sains dasar pada pelajaran biologi siswa kelas VIII SMP Negeri 7 Surakarta. *Jurnal Biology, 7*(2), 80–93.

Anggraini, B. N. W., dkk. (2020). Pengaruh penerapan model pembelajaran inkuiri terhadap hasil belajar tentang sistem gerak. *Jurnal Pijar MIPA, 15*(1), 1–8.

Bachman, J. (2005). *Metode belajar berpikir kritis dan inovatif*. Prestasi Pustaka Publisher.

Dimayati, & Mudjiono. (2015). *Belajar dan pembelajaran*. Rineka Cipta.

Erlina Sofiani. (2011). Pengaruh model inkuiri terbimbing (guided inquiry) terhadap hasil belajar fisika peserta didik pada konsep listrik dinamis. *Universitas Islam Negeri Syarif Hidayatullah*.

Hamalik, O. (2001). *Proses belajar mengajar*. Bumi Aksara.

Ibrahim, M. (2014). *Pengelolaan perpustakaan sekolah*. Bumi Aksara.

Joyce, B., & Weil, M. (2018). *Models of teaching* (10th ed.). Pearson.

Joyce, B., et al. (2009). *Models of teaching*. Pustaka Pelajar.

Muhibbin, S. (2010). *Psikologi pendidikan dengan pendekatan baru*. PT Remaja Rosda Karya.

Mulyasa, E. (2014). *Pengembangan dan implementasi kurikulum 2013*. Remaja Rosdakarya.

Slameto. (2003). *Belajar dan faktor-faktor yang mempengaruhinya*. Rineka Cipta.

Slameto. (2010). *Belajar dan faktor yang mempengaruhinya*. Rineka Cipta.

Sofiani, E. (2011). Pengaruh model inkuiri terbimbing (guided inquiry) terhadap hasil belajar fisika siswa pada konsep listrik dinamis (Skripsi). *Universitas Islam Negeri Syarif Hidayatullah*.

Suprijono, A. (2009). *Cooperative learning: Teori dan aplikasi Paikem*. Pustaka Pelajar.

Suprijono, A. (2011). *Model pembelajaran kooperatif*. Bumi Aksara.

Suryosubroto, B. (2009). *Proses belajar mengajar di sekolah*. Rineka Cipta.

Trianto, W. (2009). *Mendesain model pembelajaran inovatif-progresif*. Kencana Prenada Media Group.

Trianto, W. (2010). *Model pembelajaran terpadu: Konsep, strategi, dan implementasinya dalam KTSP*. Bumi Aksara.

Valerius, A., Marianus, M., & Dungus, F. (2023). Pengaruh penggunaan Phyphox berbasis inkuiri terbimbing terhadap hasil belajar fisika mahasiswa. *Charm Sains: Jurnal Pendidikan Fisika, 4*(1), 19-25.

Wulandari, D. (2008). Pengaruh penerapan model pembelajaran berbasis masalah terhadap penguasaan konsep dan keterampilan berpikir kreatif siswa SMP (Skripsi). *FPMIPA UPI Bandung*.