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The Effect Of Using The Discovery Learning Method On Students' Science Learning Outcomes In Grade IV

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Abstract

The learning method chosen by the teacher has an important role in the teaching and learning process, so that students will feel interested and motivated to actively participate in finding solutions to problems, not just receiving information, so that conducive learning objectives can be achieved. However, many students still have low learning outcomes, so that learning objectives are not achieved. This is also caused by a lack of understanding and motivation of students. This study aims to determine the effect of the discovery learning method on science learning outcomes of students in grade IV of SDN 091528 Siligason. This study was located at SDN 091528 Siligason with research respondents of grade IV students totaling 25 students. This study is a quantitative type with an experimental method. The data in this study were tested for analysis requirements with a normality test with the Lilifors test and a homogeneity test with the F test. Then the hypothesis was tested with a t test. Based on the results of the study, it is known that the average value of science learning outcomes of grade IV students of SDN 091528 Siligason with the application of the discovery learning method obtained a standard score of 75.62. The average value of the science learning outcomes of grade IV students of SDN 091528 Siligason without the application of the discovery learning method obtained a value of 67. With the calculated t (1,99) being greater than the t table (1,66), there is an influence of the application of the discovery learning method on the science learning outcomes of grade IV students of SDN 091528 Siligason.

Keywords: *Discovery Learning, Learning Outcomes, IPA*

INTRODUCTION

Science learning at the elementary school level plays a crucial role as a foundation for understanding the next level of education. "Science is a systematically structured collection of theories typically applied to natural phenomena (Yuliani, Herman, & Tarmizi, 2020). This science develops through scientific methods, such as observation and experimentation, and demands a scientific attitude from students ." From this definition, it can be concluded that science is a subject that focuses on understanding the universe (Ali & Setiani, 2018). "At the elementary school level, science learning is more directed at introducing basic concepts related to nature and everyday life (Hapsari & Munandar, 2020). Science material includes an introduction to living things and the environment, objects and their properties, energy and its changes, and the earth and the universe (Rahmayani, 2019). Thus, science learning

is crucial because it provides an initial foundation for students to understand the world scientifically (Sirait, 2024).

In today's education system, the use of learning strategies and methods has not been optimally implemented (Astari, Suroso, & Yustinus, 2018). This results in a lack of fundamental understanding that students should have from the outset before they begin their education at the elementary level. If the learning process is designed to be engaging and enjoyable, learning activities will not be monotonous, dull, or burdensome for students (Putra, Tandililing, & Arsyid, 2016). However, in reality, many students have a negative view of learning, likely stemming from an inappropriate introduction to learning at the early stages of education (Kadri & Rahmawati, 2015).

Given these conditions, the existence of learning methods in the educational process has become increasingly important, urgent, and strategic in addressing the challenge of improving the quality of knowledge, both for educators and students (Burais, Ikhsan, & Duskri, 2023).

"Without the implementation of innovative learning methods, efforts to improve the quality of education and student learning outcomes will be very difficult to achieve (Oktari & Desyandri, 2020)." Student interest in learning is one of the main factors influencing learning outcomes. When students have a strong interest in the learning process, they are usually more motivated and demonstrate good academic performance. Therefore, the role of teachers is crucial in creating engaging learning. Teachers need to select and implement appropriate learning methods to foster student interest in learning. "The use of effective methods will help create a quality educational process that is relevant to the needs of today's students." (Astuti, Idrus, & Yennita, 2018).

Observations also revealed that teachers at the elementary school were still using conventional methods. This likely resulted in one-way learning, leading to boredom among students due to the lack of direct involvement (Ardianti, Sujarwanto, & Surahman, 2022). Therefore, the learning method chosen by the teacher plays a crucial role in the teaching and learning process, ensuring students are engaged and motivated to actively participate in finding solutions to problems, rather than simply receiving information. This, in turn, contributes to the achievement of conducive learning objectives (Amelia & Sukma, 2021).

Given this, the author believes the most appropriate learning method to be studied in science instruction is the discovery learning method. This method fosters students' thinking skills, leading them to be more active, critical, and creative. Therefore, science instruction at the elementary school level should emphasize direct learning experiences. This method aims to stimulate students' thinking skills in understanding natural phenomena and encourage them to actively engage in analyzing and solving problems related to their environment. Furthermore, this method facilitates collaboration among students through group discussions examining natural phenomena (Khoiroh, Waqfin, & Rohmah, 2020). With experiential learning and teamwork, students will more easily understand and master science material because they are not only listening or reading but also experiencing the learning process themselves (Tambunan, Sinaga, & Hutauruk, 2021).

Researchers observed that students were more enthusiastic and understood the material more easily when actively involved in discovering their own concepts, so the use of this method was considered an effective solution to overcome existing learning problems. Therefore, with this explanation, researchers were interested in conducting a classroom action research entitled "The Effect of Discovery Learning Methods on Science Learning Outcomes of Students in Grade IV of SDN 091528 Siligason."

METHOD

The method used in this study is experimental research. "Experimental research methods are research methods used to reveal and determine the effect of a treatment on another thing under controlled conditions" (Puspitasari & Nurhayati, 2019). The design used in this study is a pre-test and post-test design, namely an experimental research design that only uses one sample group. This study involves measurements (pretest) before the treatment is given, then measurements (posttest) after the treatment is given. The population in this study were all 146 students of SD Negeri 091528 Siligason in the 2025 academic year. The sample determination in this study used a purposive sampling technique (Simanjuntak, Siregar, & Lumbangaol, 2019). This sampling technique is used when there are certain considerations in determining respondents. The sample selected in this study was grade IV at SDN 091528 Siligason. This class was chosen as the research sample so that the sample in this study amounted to 25 students consisting of 19 boys and 6 girls. The data collection technique used a learning achievement test (Subagio, Karnasih, & Irvan, 2021). There were two tests given to students to determine student learning outcomes: a pretest and a posttest. The instrument used in this study was a science learning outcome test with 20 multiple-choice questions on changes in the state of matter (Rusinta, Hambali, & Winarni, 2019). The data analysis techniques used in this study were descriptive statistical analysis and the t-test.

RESULTS AND DISCUSSION

Analysis Statistics Descriptive

The science learning outcomes of students taught by teachers at the posting stage had an overall score ranging from 60-95, with the lowest score being 60 and the highest score being 95. There were 16 students who achieved the KKM score of 75 (Reinita, 2020). The average score of students' science learning outcomes at the posting stage was 75.62 (Variani & Agung, 2020). Most students scored above 70, indicating a tendency toward fairly good learning outcomes. This data provides a general overview of students' academic achievement and can be used as a basis for further analysis (Rusinta et al., 2019).

Inferential Statistical Analysis

Data Normality Test

The normality test of the data in the control class (science learning outcomes with conventional learning method treatment) produced a maximum L_0 of 0.12735. From the list of critical values of L using Lilielfors' test with n = 25 and a significance level of $\alpha = 0.05$, $L_t = 0.173$ was obtained. From the results above, it is known that L_0 is smaller than L_t so it can be concluded that the data on students' descriptive text writing ability at the pretest stage comes from a normally distributed population (Ana, 2018). The normality test of the data on the elkspelrimeln class (students' science learning outcomes with the discovery learning method treatment) produced a maximum L_0 of 0.1254. From the list of critical values of L, Lilielfors' test with n = 25 and a significance level of $\alpha = 0.05$, $L_t = 0.173$ was obtained. From the results above, it is known that L_0 is smaller than L_t, so it can be concluded that the data

on students' science learning outcomes at the posttest stage comes from a normally distributed population (Fithriyah, Wibowo, & Octavia, 2021).

Data Homogeneity Test

This homogeneity of variance test aims to see the similarity of students' science learning outcomes based on the existing value groups at the pretest and posttest stages (Shanthi & Maghfiroh, 2020). This statistical technique is used to test the null hypothesis (H_0) which states that the variance of students' science learning outcomes based on the treatment groups is homogeneous at the real level α = 0.05, inversely proportional to the counter hypothesis (H_1) which states that the variance of students' science learning outcomes based on the value groups themselves is not homogeneous at the same level (Musdalifa, Ramdani, & Danial, 2020). Based on the calculation results, it is known that the calculated F value is 0.525 and the critical F table value is 0.54. By fulfilling the criteria for calculating the homogeneity test of the cells, the calculated F value is smaller than the critical F table value of the cells, so it can be concluded that the data in this study are homogeneous.

Hypothesis Testing

Based on the results of the t-test that has been carried out, the calculated t value is 1.99. Meanwhile, the t-table value in the table above is 1.66. Based on the criteria for testing the hypothesis written in the work attachment which reads: "The hypothesis is accepted (H_0:μ_{A1}=μ_{A2}) is rejected, if the calculated t > t table at a real level of 0.05". From the explanation above, it can be concluded that there is an influence of the discovery learning method on science learning outcomes in grade IV students of SDN 091528 Siligason (FAJRI, 2019).

Analysis Simple Linear Regression

Based on the data processing that has been carried out, it can be seen that the relationship model from the simple linear regression analysis. The constant value is 21.321, which indicates the predicted score when the independent variable is zero. The regression coefficient for Discovery Learning is 1.492 with a standard error of 0.095. This means that every one-unit increase in Discovery Learning contributes to a 1.492 increase in the dependent variable (Isnawati, 2021). The standardized coefficient (Beta) of 0.944 shows a strong positive relationship between Discovery Learning and the learning outcom (Winoto & Prasetyo, 2020). Therefore, Discovery Learning has a significant and positive effect on students' performance as indicated by the regression model.

Table 1. Simple Linear Regretio

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	21.321	8.257	

Discovery Learning	1.492	.095	.944

Source: Data processed with SPSS Statistics 26, 2024

Discussion

Based on the pretest results, the average student science learning score was 67. This finding was also supported by the researcher's observations during the study. Students in the posttest tended to feel bored and less active in learning (Sari, 2022). This condition was exacerbated by the lack of learning media used during the lesson, making the classroom appear very passive, with only the teacher appearing more active. This research finding is supported by research conducted by Marlini (Safitri & Mediatati, 2021) which found a difference in the average scores between the experimental and control classes, with a calculated t-value of 2.096 and a table t-value of 1.676 (Susanti, Jamhari, & M, 2016). Since the calculated t-value is greater than the table t-value with a df of 49 and a significance level of 5%, it can be concluded that the average student learning outcomes using the discovery learning model were higher than the average student learning outcomes using conventional learning (lecture). Based on the collected data, the average student learning outcome using the discovery learning method (posttest) was 75.62, while the average student learning outcome using conventional learning (pretest) was 67.

Furthermore, Ramadantri's (Kristin, 2016) research supports these findings, finding that the Discovery Learning model influences learning effectiveness (Istianingsih Hermawati & Andayani, 2020). The basis for this decision was a 2-tailed significance value of 0.002 < 0.05 from an independent sample t-test. These results are relevant to the student learning achievement of 93.33% (Romlah & Andi, 2021). Students responded positively to the Discovery Learning model, with 52.22% scoring excellent, 41.11% scoring good, and 6.67% scoring poor (Simatupang & Simamora, 2019). The study found that the average science learning outcomes of students using the Discovery Learning method were good, compared to those using the traditional learning model, with a significant difference of 75.62 points compared to 67. This indicates that the Discovery Learning method is superior to the traditional learning model, particularly in science (Rahmi & Fitria, 2020).

The difference in average scores (mean) across the two research classes showed significant differences. The average score for social studies learning outcomes in the posttest phase was 75.62, higher than in the pretest phase, which was 67. Furthermore, the difference in students who achieved the Minimum Competency (KKM) in science lessons was quite significant. Sixteen students in the posttest phase achieved scores that met the KKM, compared to only seven in the pretest phase. Based on the results of the t-test that has been carried out, the calculated t-value is 1.99, the t-table value is 1.66 and the results of the simple regression test can be concluded that there is an influence of the discovery learning method on science learning outcomes in grade IV students of SDN 091528 Siligason

CONCLUSION

Based on the results of the analysis of research data regarding the influence of the application of the discovery learning method on the science learning outcomes of fourth-grade students of SD Negeri 091528 Siligason, the researcher concluded that there was an influence of the ap.

REFERENCES

Ali, M., & Setiani, D. D. (2018). Pengaruh Model Discovery Learning Terhadap Hasil Belajar Peserta Didik Pada Konsep Jamur. *Bioedusiana: Jurnal Pendidikan Biologi*, *3*(2), 59–63.

Amelia, S., & Sukma, E. (2021). Pengaruh Model Discovery Learning Terhadap Hasil Belajar Siswa Pada Pembelajaran Tematik Terpadu Di Kelas V Sdn 04 Cupak Kabupaten Solok. *Jurnal Pendidikan Tambusai*, *5*(2), 4159–4165.

Ana, N. Y. (2018). Penggunaan Model Pembelajaran Discovery Learning Dalam Peningkatan Hasil Belajaran Siswa Di Sekolah Dasar. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *2*(1). Https://Doi.Org/10.23887/Jipp.V2i1.13851

Ardianti, R., Sujarwanto, E., & Surahman, E. (2022). Problem-Based Learning: Apa Dan Bagaimana. *Diffraction*, *3*(1), 27–35. Https://Doi.Org/10.37058/Diffraction.V3i1.4416

Astari, F. A., Suroso, S., & Yustinus, Y. (2018). Efektifitas Penggunaan Model Discovery Learning Dan Model Problem Based Learning Terhadap Hasil Belajar Ipa Siswa Kelas 3 Sd. *Jurnal Basicedu*, *2*(1), 1–10.

Astuti, T. I., Idrus, I., & Yennita, Y. (2018). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Hasil Belajar Pada Materi Biologi Siswa Smp. *Diklabio: Jurnal Pendidikan Dan Pembelajaran Biologi*, *2*(1), 5–9. Https://Doi.Org/10.33369/Diklabio.2.1.5-9

Burais, L., Ikhsan, M., & Duskri, M. (2023). Peningkatan Kemampuan Penalaran Matematis Siswa Melalui Model Discovery Learning. *Pendidikan Matematika*, *5*(1656–6540), 12–13.

Fajri, Z. (2019). Model Pembelajaran Discovery Learning Dalam Meningkatkan Prestasi Belajar Siswa Sd. *Jurnal Ika Pgsd (Ikatan Alumni Pgsd) Unars*, *7*(2), 1. Https://Doi.Org/10.36841/Pgsdunars.V7i2.478

Fithriyah, R., Wibowo, S., & Octavia, R. U. (2021). Pengaruh Model Discovery Learning Dan Kemandirian Belajar Terhadap Hasil Belajar Siswa Di Sekolah Dasar. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(4), 1907–1914. Https://Doi.Org/10.31004/Edukatif.V3i4.894

Hapsari, B. P., & Munandar, D. R. (2020). Pengaruh Model Pembelajaran Discovery Learning Terhadap Kemampuan Representasi Matematis Peserta Didik. *Prosiding Sesiomadika*, *2*(1b).

Isnawati, R. (2021). *Pengaruh Model Discovery Learning Berbantuan Mind Mapping Terhadap Hasil Belajar Siswa Kelas Viii Smp Islam Sudirman Kecamatan Suruh Kabupaten Semarang Pada Materi Struktur Dan Fungsi Tumbuhan Tahun Pelajaran 2020/2021*.

Istianingsih Hermawati, L., & Andayani, E. (2020). Kompetensi Pedagogik Guru, Model Discovery Learning, Dan Gaya Belajar Terhadap Kemandirian Belajar. *Jurnal Penelitian Dan Pendidikan Ips*, *14*(1), 22–30. Https://Doi.Org/10.21067/Jppi.V14i1.4761

Kadri, M., & Rahmawati, M. (2015). Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa Pada Materi Pokok Suhu Dan Kalor. *Jurnal Ikatan Alumni Fisika*, *1*(1), 21. Https://Doi.Org/10.24114/Jiaf.V1i1.2692

Khoiroh, S. U., Waqfin, M. S. I., & Rohmah, H. (2020). Pengaruh Pendekatan Saintifik Dengan Model Discovery Learning Terhadap Hasil Belajar Siswa Pada Pelajaran Fiqih Kelas Vii Mts Rahmat Said Bongkot. *Joems (Journal Of Education And Management*

Studies), *3*(3), 43–48.

Kristin, F. (2016). Analisis Model Pembelajaran Discovery Learning Dalam Meningkatkan Hasil Belajar Siswa Sd. *Jurnal Pendidikan Dasar Perkhasa: Jurnal Penelitian Pendidikan Dasar*, *2*(1), 90–98. Https://Doi.Org/Https://Doi.Org/10.31932/Jpdp.V2i1.25

Musdalifa, M., Ramdani, R., & Danial, M. (2020). Pengaruh Blended Learning Berbasis Jejaring Sosial Edmodo Pada Model Discovery Learning Terhadap Hasil Belajar Peserta Didik (Studi Pada Materi Pokok Larutan Penyangga). *Chemica: Jurnal Ilmiah Kimia Dan Pendidikan Kimia*, *21*(1), 59–69.

Oktari, N., & Desyandri, D. (2020). Pengaruh Model Discovery Learning Terhadap Hasil Belajar Tematik Terpadu Tema 8 Kelas V Sd. *E-Journal Pembelajaran Inovasi, Jurnal Ilmiah Pendidikan Dasar*, *8*(4), 87–96.

Puspitasari, Y., & Nurhayati, S. (2019). Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa. *Jurnal Pendidikan Dan Kewirausahaan*, *7*(1), 93–108. Https://Doi.Org/10.47668/Pkwu.V7i1.20

Putra, R. R., Tandililing, E., & Arsyid, S. B. (2016). Pengaruh Model Discovery Learning Terhadap Pemahaman Konsep Siswa Materi Getaran Dan Gelombang Di Smp. *Jurnal Pendidikan Dan Pembelajaran*, *5*(10), 1–11. Https://Doi.Org/Http://Dx.Doi.Org/10.26418/Jppk.V5i10.16840

Rahmayani, A. (2019). Pengaruh Model Pembelajaran Discovery Learning Dengan Menggunakan Media Video Terhadap Hasil Belajar Siswa. *Jurnal Pendidikan (Teori Dan Praktik)*, *4*(1), 59. Https://Doi.Org/10.26740/Jp.V4n1.P59-62

Rahmi, N., & Fitria, Y. (2020). Pengaruh Model Discovery Learning Terhadap Hasil Belajar Peserta Didik Dalam Pembelajaran Tematik Terpadu Di Kelas Iv Sekolah Dasar. *Jurnal Pendidikan Tambusai*, *4*(3), 2715–2722. Https://Doi.Org/Https://Doi.Org/10.31004/Jptam.V4i3.765

Reinita, R. (2020). Pengaruh Penerapan Model Discovery Learning Terhadap Hasil Belajar Siswa Pada Pembelajaran Pkn Di Kelas V Sdn 02 Aur Kuning Bukittinggi. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, *3*(2), 13–24.

Romlah, S. A., & Andi, H. J. (2021). *Pengaruh Model Pembelajaran Discovery Learning Berbantuan Video Pembelajaran Terhadap Hasil Belajar Fisika Siswa Sma*. *8*(2), 1–5.

Rusinta, D., Hambali, D., & Winarni, E. W. (2019). Pengembangan Bahan Ajar Buku Cerita Berbasis Discovery Learning Pada Materi Ipa Konsep Perpindahan Panas Di Kelas V Sekolah Dasar. *Jurnal Pembelajaran Dan Pengajaran Pendidikan Dasar*, *2*(2), 199–209. Https://Doi.Org/10.33369/Dikdas.V2i2.11963

Safitri, W. C. D., & Mediatati, N. (2021). Penerapan Model Discovery Learning Dalam Pembelajaran Ipa Untuk Meningkatkan Kemampuan Berpikir Kritis Dan Hasil Belajar Siswa Sekolah Dasar. *Jurnal Basicedu*, *5*(3), 1321–1328. Https://Doi.Org/10.31004/Basicedu.V5i3.925

Sari, E. N. (2022). *Pengaruh Model Pembelajaran Discovery Learning Dengan Mind Mapping Terhadap Hasil Belajar Siswa Pada Materi Sel Di Sma*.

Shanthi, R. V., & Maghfiroh, N. (2020). Pengaruh Model Pembelajaran Discovery Learning

Pada Pembelajaran Tematik Di Mi Ma'arif Pulutan. *Magistra: Media Pengembangan Ilmu Pendidikan Dasar Dan Keislaman*, *11*(1), 37–51. Https://Doi.Org/Http://Dx.Doi.Org/10.31942/Mgs.V11i1.3459

Simanjuntak, M. P., Siregar, L., & Lumbangaol, Y. T. (2019). Penerapan Discovery Learning Terhadap Hasil Belajar Ipa Siswa Smp. *Jurnal Inovasi Pembelajaran Fisika (Inpafi)*, *7*(4), 25–33. Opgehaal Van Http://Digilib.Unimed.Ac.Id/Id/Eprint/43273

Simatupang, J. M., & Simamora, P. (2019). Pengaruh Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa Pada Materi Pokok Momentum, Impuls Dan Tumbukan Kelas X Semester Ii Di Sma N 1 Pancurbatu Tp. 2016/2017. *Inpafi (Inovasi Pembelajaran Fisika)*, *6*(4). Https://Doi.Org/10.24114/Inpafi.V6i4.12482

Sirait, S. (2024). *Implementasi Model Discovery Learning Terhadap Hasil Belajar Mahasiswa Pada Materi Misi Pl & Pb*. *2*(3), 98–102.

Subagio, L., Karnasih, I., & Irvan, I. (2021). Meningkatkan Motivasi Belajar Siswa Dengan Menerapkan Model Discovery-Learning Dan Problem-Based-Learning Berbantuan Geogebra. *Jurnal Pendidikan Matematika Raflesia*, *6*(2), 15–26. Https://Doi.Org/Https://Doi.Org/10.33369/Jpmr.V6i2.15733

Susanti, E., Jamhari, M., & M, S. S. (2016). Pengaruh Model Pembelajaran Discovery Learning Terhadap Keterampilan Sains Dan Hasil Belajar Siswa Kelas Viii Tentang Ipa Smp Advent Palu. *Jurnal Sains Dan Teknologi*, *5*(3), 36–41.

Tambunan, L., Sinaga, S. J., & Hutauruk, A. J. B. (2021). Perbedaan Kemampuan Penalaran Matematis Menggunakan Model Pembelajaran Problem Based Learning Dengan Discovery Learning Pada Materi Aritmatika Sosial. *Attractive : Innovative Education Journal*, *4*(2), 271–280.

Variani, & Agung. (2020). Model Pembelajaran Discovery Learning Berbantuan Media Mind Mapping Terhadap Hasil Belajar Ipa Siswa Kelas V. *Jurnal Pedagogi Dan Pembelajaran*, *3*(2), 290. Https://Doi.Org/10.23887/Jp2.V3i2.26631

Winoto, Y. C., & Prasetyo, T. (2020). Efektivitas Model Problem Based Learning Dan Discovery Learning Terhadap Kemampuan Berpikir Kritis Siswa Sekolah Dasar. *Jurnal Basicedu*, *4*(2), 228–238. Https://Doi.Org/10.31004/Basicedu.V4i2.348

Yuliani, F., Herman, H., & Tarmizi, P. (2020). Pengaruh Model Discovery Learning Berbantuan Media Pop-Up Book Terhadap Hasil Belajar Tematik Siswa Kelas Iv Sd Gugus X Kota Bengkulu. *Juridikdas: Jurnal Riset Pendidikan Dasar*, *3*(1), 1–8. Https://Doi.Org/Https://Doi.Org/10.33369/Juridikdas.3.1.1-8