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Application of discovery learning model to improve learning outcomes in materials of changing objects in class V

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ABSTRACT

The learning process must be able to create fun learning situations (joyful learning) and encourage students to actively learn and think creatively. The product aspect refers to whether learning is able to achieve its goals, namely improving students' abilities according to the specified standard of ability and competence, in this case reflected in student learning outcomes. This study aims to improve student learning outcomes in the matter of changing the shape of objects through the application of the discovery learning model to fifth grade students at SD Negeri 094147. This type of research is classroom action research (PTK) which is carried out in two cycles. The subjects of this study were 25 students of class V SD Negeri 094147. Data collection techniques used are tests, observation and documentation. The data analysis technique was carried out in a quantitative descriptive manner. The results showed that there was an increase in learning outcomes, during the pre-action, the class average was 65.76 for completeness there were 12 students or 48% and incomplete there were 13 students or 52%. This result does not meet the KKM, namely 70.00. In cycle I, there was an increase in class average results of 71.92, there were 15 students or 60% completeness and there were 10 students or 40% incomplete, meaning there was an increase in the pre-action average score to cycle I of 6.16, while cycle II the results experienced another increase, namely the class average increased to 76.90 and completeness was 22 students or 88% and incomplete there were 3 students or 12%, thus there was an average increase from cycle I to cycle II of 4.98. In addition, the activeness of students in following the lessons also increased. This is indicated by the increasing activeness of students in asking questions, answering questions and expressingopinions.

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INTRODUCTION

Education is basically an interaction between educators and students, to achieve educational goals that take place in a certain environment. This interaction is called educational interaction, namely the mutual influence between educators and students (Nugrahaeni et al., 2017). The function of education is to prepare students. Preparing means that students are essentially not ready, but need to be prepared and are preparing themselves (Hamalik, 2013).

According to Dwi Lestari (2014) The use of appropriate methods in learning is very important to find the success of a learning process, where a teacher must be very good at varying methods in teaching so that students do not get bored and so that the learning objectives that have been set can be achieved. The use of the method is intended to stimulate student learning, if students are eager to learn it will be easy to achieve learning goals. One method that can improve mastery of subject matter is the discovery method.

The curriculum set by the government starting in 2013, namely using an integrated thematic for SD/MI Maulida et al (2022), said that the implementation of the 2013 curriculum was to create productive, innovative, creative, and active generations through strengthening integrated attitudes, skills, and knowledge. To realize this, teachers must be able to design effective and meaningful learning, organize learning, and develop competencies effectively to realize successful learning. In line with this opinion, according to (Paulina Heynoek et al., 2020). The 2013 curriculum is a concept that combines several disciplines to provide meaningful experiences and to students. One of the compulsory subjects at the elementary school level in the high class is science learning. Natural Sciences (IPA) is a science that studies various natural phenomena and their changes. According to Jannah & Atmojo (2022), Science at the elementary school level is aimed at everyday life. In line with this opinion, knowledge in science learning can be obtained by activities that contain facts, concepts, and theories in understanding the material. (Aisyah, 2017) Students' ability to understand concepts that are useful and can be applied in learning.

Sudrajat, (2008) argues that the learning model is basically a form of learning that illustrated from start to finish which is typically presented by the teacher as a unified whole. Next according Johnson in Rahmi (2014), reveals that to know the quality of the learning model must be seen from two aspects, namely process and product. The process aspect refers to learning that is able to create fun learning situations (joyful learning) and encourage students to actively learn and think creatively. The product aspect refers to what is learning able to achieve the goal, namely to improve the ability of students according to the specified standard of ability and competence, in this case reflected in student learning outcomes. Sudjana (2013) explains that learning outcomes are abilities possessed by students after they receive their learning experience

Problem solving ability is one of the fundamental human cognitive processes, and is the most important ability that must be possessed by students to prepare them to be able to survive in facing the challenges they will face in the future. In line with this opinion, Cooney stated that problem solving abilities are very important so that students can solve the problems they face and help students think analytically in making decisions in everyday life (Ummu Fahda Damanik et al., 2023).

The factor that causes low student learning outcomes is the teaching method factor. Unfavorable teaching method factors can occur, for example, because the teacher is unprepared and does not master the subject matter so that the teacher presents it unclearly or the teacher's attitude towards students and towards the subject is not good. So that students are not happy with the teacher's lessons, as a result students are not interested in learning (Aisyah, 2017). To determine the effectiveness of implementing a learning model, an indicator is used to measure the success rate of the learning model. One of the indicators used to determine the success of a model in learning is cognitive learning outcomes. Cognitive learning outcomes are indicators to measure the effect of student learning and to evaluate the quality of teaching. Cognitive learning outcomes will be influenced by the learning process, curriculum design, and teaching (Lin et al., 2017). To overcome

student learning problems, researchers try to apply learning models that are directed and centered on students by facilitating adequate tools, media and learning resources. For this reason, the use of the Discovery Learning method or discovery learning is carried out.

The discovery learning model will make students more emphasized on finding problems, processing data, proving, and drawing conclusions about the material on their own. So that in the learning process students are directed to find something new for themselves. To optimize the results and success of the discovery learning model, teachers are expected to be able to understand this learning model optimally. So that with optimal understanding, the teacher can carry out learning effectively in order to increase the attitude of curiosity and student learning outcomes in the learning process (Yuliati et al., 2023). The advantage of the discovery learning learning model is that the knowledge obtained through this method is very personal and powerful because it strengthens understanding, memory, and transfer (Kemendikbud, 2013). Strengthening understanding, memory (in long-term memory) and the intended transfer is about the learning material being studied. This ability makes it easier for students to master the learning material they are studying. So that a lot of learning that uses the discovery learning learning model is successful and influences student learning outcomes to increase (Nurunnisa et al., 2023)

Science learning should have more varied models and strategies in order to optimize students' learning motivation. Selection of methods, strategies and approaches in designing learning models in order to achieve active and enjoyable learning is a demand that must be met by teachers. Teachers need to compile and carry out teaching and learning activities where children can actively construct their own knowledge in a fun way. The make a match learning model is one of the learning models that can be applied because in this learning process students can learn science material actively and happily. This is because the characteristics of the make a match learning model have a close relationship with the characteristics of students who like to play (Aris, 2016).

In the Discovery Learning learning system, the teacher does not directly present the lesson material, but students are given the opportunity to find a problem using a problem solving approach. Discovery Learning has the following steps: (1) Problem identification, (2) Developing possible solutions (hypotheses), (3) Data collection, (4) Data analysis and interpretation (5) Test conclusions (Nugrahaeni et al., 2017). The application of the discovery learning model has a main focus, namely guiding students to be able to find new things for students in the form of concepts and formulas, this learning model is also able to link relevant concepts that students already have and involve students' thinking processes so as to encourage students to be active in learning (Salmi, 2019). According to Widiadnyana (2014) there are differences in understanding concepts and scientific attitudes between students at discovery learning model with direct learning model. Through this discovery learning process it is expected to be able to give a good influence on the effectiveness and student learning outcomes (Widiadnyana et al., 2014). This study aims to improve student learning outcomes IPA in the matter of changes in the shape of objects through the application of the Discovery Learning model to fifth grade students at SD Negeri 094147

RESEARCH METHODOLOGY

This research was carried out in the odd semester of the 2022/2023 school year in class V SD Negeri 105394 Marihat Dolok, Bintang Bayu District, Deli Serdang Regency. The sample of this study was in class V with a total of 25 students at SDN 094147 Sibungabunga. the type of research used in this study was classroom action research (CAR). classroom action research is action research conducted by teachers with the aim of improving the quality of learning practices in their classes. PTK focuses on the teaching and learning process that occurs in class, carried out in natural situations. In CAR, the teacher gives action to students. The action is an activity that is deliberately designed to be carried out by students with a specific purpose. According to (Arikunto, 2012), what is meant by action is

an activity given by the teacher to students so that they do something different from usual, not just work on questions written on the blackboard, or work on worksheets.

This research was carried out in two cycles, where in the first cycle the data collection technique was carried out by means of a written test and the results of discussions with colleagues were then carried out in cycle II using the lecture, question and answer and discussion methods. In the second cycle, data collection techniques were carried out by means of written tests and discussions with colleagues about the successes and deficiencies in the pre-cycle of learning through the lecture and question and answer methods as well as the discovery learning method.

Data analysis was carried out in a quantitative way by calculating the acquisition value of increasing self-study results in each cycle. Improving student learning outcomes is done by quantitative data analysis

RESULTS AND DISCUSSIONS

1) Results

Increase in learning outcomes from cycle I to cycle II, can be seen in table 1 below:

Table 1.
List of learning outcomes values cycle I with cycle II

Average		Completeness				percentage			
		Cycle I		Cycle II		Cycle I		Cycle II	
I	II	Complete	Not Finished	Complete	Not Finished	Complete	Not Finished	Complete	Not Finished
71,92	79,6	15	10	22	3	60%	40%	88%	12%

Observation of Cycle II teacher activities was carried out in two meetings, namely meeting 1 and meeting 2. Observation results at each of these meetings are presented in table 2

Table 2.
Comparison of teacher activity observation results in cycle I
Meetings 1 and 2, as well as cycle II meetings 1 and 2

No	Stage	value amount	Completeness of Teaching Activities	Category
1	Cycle I Meeting 1	30	62,5%	Good
2	Cycle I Meeting 2	32	66,6%	Good
3	Cycle II Meeting 1	39	81,25%	Very good
4	Cycle II Meeting 2	40	83,33%	Very good

To find out more details about improving learning outcomes can be seen from table 3

Table 3.
List of pre-cycle learning outcomes, cycle I and cycle II

Completeness						Average		
Pre-Cycle		Cycle I		Cycle II				
Complete	Not Finished	Complete	Not Finished	Complete	Not Finished	Pre-Cycle	Cycle I	Cycle II
12	13	15	10	22	3	65,76	71,92	76,9

Based on the data above, it can be seen that there is an increase in learning outcomes. This can be seen in the class average. From pre-cycle to cycle I, which was 6.16 from 65.76 to 71.92. From cycle I to cycle II there was an increase of 4.98 from 71.92 to 76.9. Apart from the class average, an increase also occurred in the student's completeness score. The number of students who scored >70

from pre-cycle to cycle I increased by 3 or 12% of all students, while from cycle I to cycle II it was 7 or 28% of all students. Based on this, the criteria for success in the pre-cycle had not been achieved because the KKM achievement was only 48% of all students. Then in the first cycle it increased to 60% and in the second cycle it increased again to 88%. Based on these data, this research was achieved because more than 75% of students achieved KKM.

2) Discussions

Application of models there are several learning discovery learning deficiency due to several factors. These factors include the required sufficient time to implement the model learning discovery learning, students takes time to acclimate in applying the discovery learning learning model, difficult to control every learner who have different characteristics in the class which has a large number of students (Prilliza et al., 2020). This discovery learning model focus on mental abilities and the physique of the students who will strengthens vigor and concentration they are doing activities learning (Rosarina et al., 2016). Student not only given the theory, but them dealing with a number of facts.From theory and facts that, they are expected able to formulate a number of discoveries. Thus, students are motivated to demonstrate cognitive abilities in studying physics and students get the maximum benefit of the learning process and outcomes

The results of research regarding improving student learning outcomes through the application of the Discovery Learning model. Based on the research, the application of the Discovery Learning model was able to improve learning outcomes on material changes in the shape of objects in class V SDN 094147 Sibungabunga. This is because learning using the application of the Discovery Learning model in the learning process can attract students' attention so that it helps increase students' understanding of the material presented by the teacher because the Discovery Learning learning model is designed to influence the pattern of interaction of students with each other so that they work together in solving the problems they get in a structured manner. starting from stimulation, stating the problem, collecting data, processing data, re-verifying the answers that have been compiled or completed and then draw conclusions from the results of the answers that have been obtained.

The discovery learning model has an influence on the effectiveness of learning (Rosdiana, R., Boleng, D. T., & Susilo, 2017). Learning Science with the discovery learning model is more effective compared with the expository model on the results student learning in the moderate category. Learning outcomes students who apply the discovery learning model have a difference with learning that applying the expository model (Mahdi et al., 2019). Discovery learning model too provides many opportunities for the students to be directly involved in learning activities, activities like that will more motivation to learn, because it is adjusted to the interests and their own needs (Putri et al., 2017).

The advantages of the discovery learning model are helping students find themselves, designing processes to determine an outcome, training students to be responsible for managing information carried out on a problem and finally students who produce. Learning with the discovery learning model can increase the activity of students in participating in the teaching and learning process of mathematics because it is assisted by various types of discoveries or experiments made by students which are presented and/or presented so that students become more active and make students become interested in solving the problems that have been proposed in learning (Septiana et al., 2013).

Based on the results obtained from cycle I to cycle II, it can be concluded that the application of the Discovery Learning model can improve learning outcomes in the matter of changes in the shape of objects in class V SDN 094147 Sibungabunga.

CONCLUSION

In cycle I, the application of the Discovery Learning model in the subject of changing the shape of objects can increase student learning outcomes from a class average score of 65.76 to 71.92 and if seen from the achievement of KKM this value has reached KKM. Then in cycle II, the average value of students increased again to 76.90. This score has reached the KKM and has reached the target where more than 75% of students get a score of more than 70. The results of observations of student attitudes, from cycle I to cycle II have increased. This is evidenced by increased student activity.

From the description above, it can be concluded that the learning outcomes and activeness of fifth grade students at SDN 094147 Sibungabunga increased with the application of the Discovery Learning model to material changes in the form of objects. Based on the conclusions above, it is suggested that future researchers can use the Discovery Learning model in extensive trials and use the environment as a learning resource as a reference for effective and enjoyable learning.

References

Aisyah. (2017). Peserta Didik Pada Mata Pelajaran Ekonomi Di Sma Negeri 15 Palembang. *Jurnal Profit*, *4*, 1–11.

Arikunto, S. (2012). *Dasar-Dasar Evaluasi Pendidikan*. Bumi Aksara.

Aris, S. (2016). *Model Pembelajaran Innovatif Dalam Kurikulum 2013*. Arruzz Media.

Dwi Lestari, N. (2014). *Pentingnya Penggunaan Metode Dalam Proses Pembelajaran*. Https://Www.Academia.Edu/.

Hamalik, O. (2013). *Proses Belajar Mengajar*. PT. Bumi Aksara.

Jannah, D. R. N., & Atmojo, I. R. W. (2022). Media Digital dalam Memberdayakan Kemampuan Berpikir Kritis Abad 21 pada Pembelajaran IPA di Sekolah Dasar. *Jurnal Basicedu*, *6*(1), 1064–1074. https://doi.org/10.31004/basicedu.v6i1.2124

Kemendikbud. (2013). *Model Pembelajaran Penemuan (discovery)*. Kementrian Pendidikan dan Kebudayaan.

Lin, M. H., Chen, H. C., & Liu, K. S. (2017). A study of the effects of digital learning on learning motivation and learning outcome. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(7), 3553–3564. https://doi.org/10.12973/eurasia.2017.00744a

Mahdi, M., Savalas, L. R. T., & Hakim, A. (2019). Pembelajaran Kimia Berorientasi Discovery untuk Meningkatkan Literasi Sains Peserta Didik. *Jurnal Pijar Mipa*, *14*(2), 13–17. https://doi.org/10.29303/jpm.v14i2.1181

Maulida, L., Aulia Mufti, Z., Latifah, A., & Agung, R. (2022). *Educational Journal of Islamic Management (EJIM) Educational Journal of Islamic Management (EJIM) licensed under Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)*.

Nugrahaeni, A., Wayan Redhana, I., & Made Arya Kartawan, I. (2017). Pendidikan Kimia Indonesia 23 Amallia Nugrahaeni, I Wayan Redhana, I Made Arya Kartawan. Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Kemampuan Berpikir Kritis dan Hasil Belajar Kimia. In *Jurnal Pendidikan Kimia Indonesia* (Vol. 1, Issue 1).

Nurunnisa, A., Lubis, E. M., & Wulandari, W. (2023). Pengaruh Model Pembelajaran Discovery Learningpada Pembelajaran Literasi dan Numerasi terhadap Teks Prosedur Kelas VII SMP Swasta Pembangun. *PEDAGOGI:JurnalIlmiahPendidikan*, *0*, 50–53. http://siakad.univamedan.ac.id/ojs/index.php/pedagogi/article/view/560/392

Paulina Heynoek, F., Kurniawan, R., Wibowo Kurniawan, A., Pendidikan Jasmani Kesehatan dan Rekreasi, J., & Ilmu Keolahragaan, F. (2020). Pengembangan Perangkat Pembelajaran Model Discovery Learning Materi Gerak Lokomotor Kelas Rendah Sekolah Dasar. *Sport Science and Health |*, *2*(8), 2020. http://journal2.um.ac.id/index.php/jfik/indexhttp://fik.um.ac.id/

Prilliza, M. D., Lestari, N., Merta, I. W., & Artayasa, I. P. (2020). Efektivitas Penerapan Model Discovery Learning Terhadap Hasil Belajar IPA. *Jurnal Pijar Mipa*, *15*(2), 130–134. https://doi.org/10.29303/jpm.v15i2.1544

Putri, R. H., Lesmono, A. D., & Aristya, P. D. (2017). Pengaruh Model Discovery Learning terhadap Motivasi Belajar dan Hasil Belajar Fisika Siswa Man Bondowoso. *Jurnal Pembelajaran Fisika*, *6*(2), 168–174. https://core.ac.uk/download/pdf/291838233.pdf

Rahmi, S. (2014). *Pengaruh Penggunaan Model Treffinger terhadap Hasil Belajar Siswa Pada Mata Pelajaran Aqidah Akhlak di MTsN Model Kuok Kecamatan Kuok*. Universitas Islam Negeri Sultan Syarif Kasim Riau.

Rosarina, G., Sudin, A., & Sujana, A. (2016). Penerapan Model Discovery Learning untuk Meningkatkan Hasil Belajar Siswa pada Materi Perubahan Wujud Benda. *Jurnal Pena Ilmiah*, *1*(1), 371–377.

Rosdiana, R., Boleng, D. T., & Susilo, S. (2017). *Pengaruh Penggunaan Model Discovery Learning Terhadap Efektivitas Dan Hasil Belajar Siswa*. *2014*, 1060–1064. http://journal.um.ac.id/index.php/jptpp/

Salmi, S. (2019). Penerapan Model Pembelajaran Discovery Learning Dalam Meningkatkan Hasil Belajar Ekonomi Peserta Didik Kelas Xii Ips.2 Sma Negeri 13 Palembang. *Jurnal PROFIT Kajian Pendidikan Ekonomi Dan Ilmu Ekonomi*, *6*(1), 1–16. https://doi.org/10.36706/jp.v6i1.7865

Septiana, K. A. K., Rukhmana, T., Solehuddin, M., & Sitopu, J. W. (2013). Pengaruh Model Pembelajaran Discovery Dengan Bantuan Phet Terhadap Hasil Belajar Siswa. *Journal on Education*, *6*, 242–256. https://jonedu.org/index.php/joe/article/view/2937/2484

Sudjana, N. (2013). *Penilaian Hasil Proses Belajar Mengajar*. Remaja Rosdakarya.

Sudrajat, A. (2008). *Pengertian Pendekatan, Strategi, Metode, Teknik, Taktik, dan Model pembelajaran*. Sinar Baru Algensindo.

Ummu Fahda Damanik, R., Saragih, S., & Matematika Pascasarjana, P. (2023). Perbedaan Kemampuan Pemecahan Masalah dan Penalaran Matematis Siswa yang Diajar Menggunakan Model Pembelajaran Problem Based Learning (PBL) dan Discovery Learning. *Jurnal Cendikia*, *07*, 1332–1344. https://doi.org/10.31004/cendekia.v7i1.2350

Widiadnyana, I. W., Sadia, I. W., & Suastra, I. W. (2014). No TitlePengaruh Model Discovery Learning terhadap Pemahaman Konsep IPA dan Sikap Ilmiah Siswa SMP. *Jurnal Pendidikan IPA*, *4*. https://ejournal-pasca.undiksha.ac.id/index.php/jurnal_ipa/article/view/1344/1036

Yuliati, C. L., Susianna, N., Harapan, U. P., & Surya, S. (2023). Penerapan Model Pembelajaran Discovery Learning Dalam Meningkatkan Keterampilan Proses Sains, Berpikir Kritis, dan Percaya Diri Siswa The Implementation Of Discovery Learning Model In Improving Science Process Skills, Critical Thinking, And Self-Confidenc. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *13*. https://doi.org/https://doi.org/10.24246/j.js.2023.v13.i1.p48-58