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Use of the Read, Answer, Discuss, Explain and Create Learning Model in Science Learning Knowledge Nature to Improve Elementary School Students' Ability to Understand Concepts

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Abstract : Students' understanding of concepts is a form of ability to master a number of learning materials, where students do not just know and remember, but are able to re-express the concepts they understand using their own language or in a form that is easier to understand and comprehend. able to apply. The purpose of this research is to determine the increase in students' conceptual understanding abilities by using the RADEC learning model in science learning. The research method used is a mixed method with a sequential explanatory research design. The population in this study were all students in one of the West Bandung Regency elementary schools with a sample of 35 grade IV students. The instruments used in this research were test and non-test instruments. Data analysis techniques were carried out in a way Qualitative and quantitative . The results of this research are based on the results of pretest and posttest answers to students' concept understanding abilities. To strengthen these results, observations, interviews and distribution of student questionnaires were carried out regarding the difficulties of teachers and students in implementing this learning activity. Based on the results of data analysis, it can be concluded that the use of the RADEC learning model can improve the ability to understand concepts in class IV students as evidenced by the sig (Paired Sample T-Test) value of 0.000 < 0.05

Keywords: Concept Understanding; RADEC Learning Model; Science Learning.

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Introduction

Natural Science or Natural Science is also called science, comes from the Latin word scientia which means knowledge, namely knowledge that results from learning and proving. Science in English is natural science, natural which means nature or everything related to nature, science which means knowledge. So natural science is the study of nature and all its contents (Dewi & Suhandi, 2016). Science is a branch of knowledge that originates from natural phenomena. Science is also defined as a collection of natural objects and phenomena resulting from the ideas and research of various experts carried out through experiments and using scientific methods (Hisbullah & Selvi, 2018).

Science subjects are one of the subjects taught in elementary schools, science is needed to develop students' curiosity, foster positive behavior towards science through observing the surrounding environment so that students' ability to understand various concepts in science subjects is formed (Anggraeni & Wulandari, 2022). Science learning always involves the environment and natural surroundings, so learning activities must be carried out wisely so that they are beneficial for human life and can be applied in daily activities. Meanwhile, the problems that occur in learning activities are that students are not active in learning activities, students just sit and listen to the teacher's explanation, students only read from one reading source, students lack the courage to ask questions or express opinions. In fact, most students find science learning difficult to understand because there are many concepts that must be studied and memorized, besides that teachers have not used interesting learning models that can increase student activity. This is what causes students' low understanding of concepts, so that the ability to understand concepts needs to be improved.

According to Suryani (2019) , Deliany et al., (2019) Zuleni & Marfilinda, (2022) , conceptual understanding is the ability a person has to understand or know a concept after knowing or remembering the concept. Comprehension is a student's level of thinking ability which is one level higher than remembering or memorizing. Students are said to understand if they can explain something in more detail about something using their own language. The ability to understand concepts is very important for students to have and can be the key so that students can learn lessons well. The ability to understand concepts is very important for students to have since elementary school, because in elementary school students can obtain basic learning materials to prepare themselves for learning at the learning level. continuing education (Ruqoyyah et al., 2020). Students who have the ability to understand concepts can be seen when the student has the ability to understand a number of concepts that they have studied, where students not only remember and memorize the material they have studied, but students are also able to recall it. express concepts they have understood using their own language. or into another form that is easier to understand.

To measure students' ability to understand concepts, analysis of their ability to understand concepts is needed. According to Klipatrick and Findel in Handayani (2018) and Fauzia & Kelana, (2020) stated that there are seven indicators of the ability to understand concepts, namely: (1) The ability to restate a concept being studied. (2) Ability to classify objects. (3) Ability to apply concepts through algorithms. (4) Ability to provide examples and non-examples of the concepts that have been studied. (5) Ability to express concepts in various mathematical representations. (6) Ability to connect various concepts. (7) The ability to develop necessary and sufficient conditions for a concept.

By increasing students' ability to understand concepts, teachers can apply learning models that are appropriate to the material. One way is to use the RADEC (Read, Answer, Discuss, Explain and Create) learning model. So that this learning activity can be effective and can improve students' ability to understand concepts. Then it is necessary to pay attention to effectiveness in determining the learning model, because the learning model chosen must be in accordance with the learning objectives, type of learning and the nature of the material to be taught. One way to overcome this problem is to apply a learning model that is interesting and able to involve student activities.

According to Sopandi et al. (2021) The RADEC learning model is the name of a learning model that is adapted to the learning steps, namely reading, answering, discussing, explaining and creating, so that it is easy to remember the order of application. Then the RADEC learning model became one of the choices for using innovative learning models in Indonesia whose steps are easy to know. This learning model is also built on the education system in Indonesia which requires students to understand various concepts of learning material in a limited time (Pohan et al., 2021 ; (Kelana et al., 2022) . The RADEC learning model is also a learning model that can stimulate students to develop 21st century skills and understand the concepts they have learned (Setiawan et al., 2020; (Maulana et al., 2022).

The steps of the RADEC learning model according to Sopandi et al. (2021) and (Firdaus et al., 2023) consist of five stages, including: (1) Read, in this learning step students receive learning material as reading material from various sources, both printed media such as books and other sources. like the internet. (2) Answer, students answer pre-learning questions based on the knowledge gained in the read (R) learning step, pre-learning questions are done independently before the learning meeting in class. (3) Discussion or discussions, in this learning step, students in groups carry out discussion activities regarding answers to pre-learning questions that have been carried out independently outside the classroom or at home before a learning activity meeting is held in class. (4) Explaining or explaining, there is a classic presentation activity by presenting the results of the discussion. In this step the teacher also encourages other students to ask questions, express opinions, refute their friends' opinions, or add to their friends' opinions, based on things that have been conveyed by other groups. In this step the teacher also provides the opportunity to explain concepts related to learning that students do not yet understand. (5) Creating or creating, in this learning step the teacher motivates students to learn to apply the knowledge they have mastered by generating creative ideas or thoughts.

In science learning there is a lot of material, one of the materials in science learning that is relevant to everyday life is energy and its changes, but it is relatively difficult for students to understand. So this material is considered difficult to achieve the KKM value. Energy material and its changes must be presented using an

appropriate learning model so that it is always easy for students to understand. Energy is the ability of an object to do work or effort, while energy change is the change from one form of energy to another form of energy. In research conducted by Hidayat, et al (2023), they developed teaching materials based on the radec learning model to improve understanding of science concepts for fifth grade elementary school students.

Based on the explanation above, researchers are interested in using the RADEC learning model to improve fourth grade elementary school students' ability to understand concepts in science learning.

Methodology

The Mixed Methods research method uses a sequential explanatory design. Sequential explanatory designs are a combined research method that combines quantitative and qualitative research methods sequentially, where in the first stage the research is carried out using quantitative methods and in the second stage it is carried out using qualitative methods (Mustaqim , 2016; Wiguna , 2020).

Figure 1. Sequential Explanatory Designs

The research was carried out at SDN 1 Cisadanwut with a class IV sample of 35 students. The instruments used in this research were test and non-test instruments. The test used is a concept understanding ability test.

The indicators of the ability to understand concepts used by researchers are indicators of the ability to restate concepts, the ability to classify objects, and the ability to provide examples and non-examples of the concepts being studied. The procedures in this research include: (1) Collecting and analyzing quantitative data; (2) Strategy development stage based on quantitative results; (3) Collect and analyze qualitative data; (4) Interpret. Then in testing the test instrument has been tested at a higher level than the subject matter to be studied, to determine validity, reliability, level of difficulty and distinguishing power.

As for the data processing procedures in this research, quantitative data is processed with inferential statistics using Microsoft Excel and the IBM SPSS Statistics 25 program, which includes: (1) Scoring; (2) Descriptive analysis; (3) Normality test; (4) Homogeneity test; (5) Difference test. Meanwhile, qualitative data takes the form of observations, questionnaires, interviews which are processed systematically through

category descriptions and data synthesis, including: (1) During data collection; (2) Data reduction (data reduction); (3) Data display (data presentation or data display); (4) Conclusion and verification (drawing conclusions or verifying).

Results and Discussion

Results

Based on the results of research conducted at SDN 1 Cisandawut. The data obtained is quantitative data and also qualitative data which is analyzed sequentially according to Mix Method rules with a Sequential Explanatory design. Quantitative data was obtained from the results of students' conceptual understanding tests before learning (pretest) and after learning (posttest) who were treated with learning activities using the RADEC learning model. Meanwhile, qualitative data was obtained from observation, distributing questionnaires and teacher interviews. The ability to understand concepts of class IV students at one of the elementary schools in Sindangkerta District, West Bandung Regency for the 2022/2023 academic year is still quite low. One of the reasons why students do not understand concepts is because they have not used learning models in teaching and learning activities. If the process of learning activities is carried out normally, and the learning activities are not student-centered, then the learning activities will be less effective. This can be seen when students' learning has difficulty achieving the minimum completeness criteria or KKM that has been set. Apart from that, based on the results of observations and questionnaire analysis that has been carried out, it can be concluded that there are several students who experience difficulty in understanding concepts in one of the indicators of concept understanding, namely restating the concept, in this case the sentences used to explain are still very simple. Meanwhile, based on the results of interviews, teachers still experience difficulties in improving their ability to understand concepts using the RADEC learning model, when learning time is insufficient and they have difficulty monitoring students' pre-learning activities.

pretest with the lowest score of 40.00 and the highest score of 86.00. The total score obtained in the pretest results was 2240 with an average of 64.00. Meanwhile, the minimum score obtained on the posttest is 66.00, the maximum score is 100.00 with the total score obtained on the posttest results being 2960 with an average of 84.57 Next, the data was processed through a normality test using the Kolmogrov-Smirnov reference, which obtained a pretest sig value of 0.200 and a posttest of 0.128. Thus, if both the pretest and posttest scores are greater than 0.05 then H0 is accepted and Ha is rejected , meaning both data are normally distributed. So it can be concluded that the pretest and posttest results are normally distributed. After going through a normality test, the data is processed through a homogeneity test . It can be seen that the P-value (Sig.) homogeneity test results of 0.502 are greater than $\alpha = 0.05$, thus this condition shows that Ho is accepted and Ha is rejected . It can be concluded that there

are similarities in test variance between the posttest and pretest. So, pretest and posttest data are in nature homogeneous homogeneous.

Based on prerequisite test results stating _ that the data is normally distributed and the data is characteristic homogeneous , then next For do parametric statistical research to test the hypothesis use t test (Paired Samples T Test) . The result shows that the P-value (Sig. 2-tailed) obtained from the pretest and posttest results is 0.000 less than 0.05, which means it is based on decision making using the t test shows that there is a significant difference between the initial variable and the final variable. Thus, this condition shows that Ho is rejected. So it can be concluded that there is an influence of using the RADEC learning model in improving the ability to understand concepts in science learning for fourth grade elementary school students. So it can be concluded that in this research there was an increase in the ability to understand concepts by using the RADEC learning model in improving the ability to understand concepts in science learning for fourth grade elementary school students.

Furthermore, to find out qualitative data, there is data obtained through analysis of the results of observations, questionnaires and interviews regarding teachers' difficulties in implementing the RADEC learning model in improving students' ability to understand concepts. The results of the analysis of observations and distribution of questionnaires to students show that there is a positive response from students towards learning activities. The difficulty for students in improving their ability to understand concepts is that it is difficult to restate concepts, that is, students cannot use their own sentences, the explanations used are still very simple.

Discussion

Based on the results of data analysis from pretest, posttest, observation, distribution of student questionnaires and interviews with teachers conducted by researchers, researchers obtained data that one of the factors causing the decline in students' ability to understand concepts was the lack of use of learning aids. an interesting learning model in teaching and learning activities. According to Baiduri, Utomo, & Wardani (2021) conceptual understanding is a student's ability to obtain explanations such as being able to understand things being studied, providing more detailed explanations using their own words, restating a concept, grouping concepts and expressing material. being studied. studied in a simple and easy to understand form. Meanwhile, according to Handayani, (2018) conceptual understanding is the ability a person has to interpret existing concepts, based on the basic knowledge they have using their own language and being able to connect with new knowledge. A student is said to understand if he can express a more detailed picture of something using his own language. In science learning in elementary schools, students must be involved in teaching and learning activities so that students can understand knowledge and facts about the natural environment in everyday life. So the use of the

RADEC learning model is very appropriate to apply in science learning. In classroom learning activities, apart from being able to involve students, collaboration can make it easier for students to understand lesson material so that students improve their understanding of concepts.

Then according to Sopandi et al. (2021) stated that in learning using the RADEC learning model there are shortcomings, namely the need to provide reading material from various sources for student learning independence. This can be seen from the results of the analysis of student observations and questionnaires that there are some students who do not read reading sources in pre-learning activities, so that students have difficulty understanding a concept and when students give an explanation they have difficulty using their own understanding. Language. In learning activities there is an explaining syntax, namely at this stage students are asked to explain the concept from the results of their discussion (Maspiroh & Sartono, 2022). At this stage students make presentations in front of the class, but the sentences used in explaining are still very limited, and the words used are almost the same as words found in books or other reading sources. Apart from that, at this stage there are also question and answer activities, but the language used tends to be short and simple. Even though there are deficiencies in students' language in restating concepts and in asking questions, students' enthusiasm in learning science using the RADEC learning model is very good. According to Pohan et al. (2021) the RADEC learning model is a learning model whose learning activities are student centered or student centered learning by carrying out a series of learning activities to understand concepts, collaborate, solve problems and produce an idea or work. In accordance with the opinion of Yulianti et al. (2022) the RADEC learning model emphasizes student-centered learning so that active learning activities can be created in asking questions, discussing, expressing opinions and drawing conclusions regarding the material that has been studied. This is in accordance with Sulaiman's (2022) opinion that good student participation in learning activities can improve students' ability to understand the material they are studying.

Conclusion

Based on the results of the research and discussion, it can be concluded that in this research the application of the RADEC learning model is to improve the ability to understand concepts in science learning for fourth grade elementary school students. Increasing the application of the RADEC learning model to improve the ability to understand concepts in science learning has increased significantly. This can be seen from the results of calculating the average difference using the t-test (Paired sample T-Test) at the significance level a=0. 05 , obtained a P-value (Sig.2-tailed) of 0.000. Because the required P value (Sig.2-tailed) 0.000/2 = 0.000 is smaller than 0.05. The difficulties experienced by students in improving their ability to understand concepts based on the results of observation and questionnaire analysis can be concluded that students

still experience difficulties with one of the indicators of their ability to understand concepts, namely restating concepts, in this case students experience difficulties in understanding the concepts contained in explaining something. return. things that they already understand, which when students express them they cannot yet use their own language.

Reference

Anggraeni, RA, & Wulandari, MA (2022). Application of the Problem Based Learning (PBL) Model to Measure Understanding of Elementary School Class 2 Students' Concepts on Science Material Theme 6 Caring for Animals and Plants. COLLASE (Creative Learning for Elementary Education Students), 05(01), 157–161.

Baiduri, Utomo, DP, & Wardani, C. (2021). Understanding Geometric Concepts Viewed from Intrapersonal and Interpersonal Intelligence. UMM Press.

Deliany, N., Hidayat, A., & Nurhayati, Y. (2019). Application of interactive multimedia to improve students' understanding of science concepts in elementary schools. Educare, 90–97.

Dewi, SZ, & Suhandi, A. (2016). Application of the Pedict, Discussion, Explain (Pdeode) strategy in elementary science learning to increase understanding of concepts and reduce the quantity of students who have misconceptions about the material on changes in the form of objects in class V. Journal of Basic Education, 8(1), 12–13.

Fauzia, NLU, & Kelana, JB (2020). Improving Students' Reading Comprehension Ability with Online Magazine Media Using the Cooperative Learning Model Starting with Questions in Class V Elementary School. Journal of Elementary Education, 03(04), 174–181.

Firdaus, AR, Sopandi, W., Kelana, JB, Fasha, LH, Fiteriani, I., & Maulana, Y. (2023). The Effectiveness of Radec Based on Improving Learning Planning Skills in Elementary Schools. Pratama: Journal of Primary School Teacher Education, 12(2), 560. https://doi.org/10.33578/jpfkip.v12i2.9018

Handayani, TW (2018). Increasing Understanding of Science Concepts Using the Guided Inquiry Learning Model in Elementary Schools. Journal of Education and Education Sciences, 6(2), 135–145.

Hidayat, AN, Kelana, JB, & Sutinah, C. (2023). Development of Teaching Materials Based on the RADEC Learning Model to Improve Understanding of Science Concepts for Class V Elementary School Students. Indonesian Journal of Action Research, 5(3), 129–137.

Hezbollah, & Selvi, N. (2018). Natural Science Learning in Elementary Schools. Eastern Script.

Kelana, JB, Sopandi, W., Firdaus, AR, Maulana, Y., Fasha, LH, & Fiteriani, I. (2022). Elementary School Teachers' Ability to Create Pre-Learning Questions Using the Radec Model. Pendas Cakrawala Journal, 8(4), 1171–1180. https://doi.org/10.31949/jcp.v8i4.2688

Maspiroh, I., & Sartono, EKE (2022). Radec Learning Model (Reading, Answering, Discussing, Explaining, and Creating) to Improve Students' High Order Thinking Skills in Science Learning in Elementary Schools. Metacognition: Journal of Educational Studies, 4(2), 85.

Maulana, Y., Sopandi, W., Sujana, A., Robandi, B., Agustina, NS, Rosmiati, I., Pebriati, T., Kelana, JB, Fiteriani, I., Firdaus, AR, & Fasha, L. H. (2022). Development and Validation of Air Theme Worksheets Based on the RADEC Model and 4C Skills Oriented. Journal of Science Education Research, 8(3), 1605–1611. https://doi.org/10.29303/jppipa.v8i3.1772

Mustaqim, M. (2016). Combined Quantitative Qualitative Research Methods/Mixed Methods An Alternative Approach. Intelligence: Journal of Islamic Education, 4(1).

Pohan, AA, Abidin, Y., & Sastromiharjo, A. (2021). RADEC Learning Model in Learning Students' Reading Comprehension. XIV International Language Check Seminar.

Ruqoyyah, S., Murni, S., & Linda. (2020). Ability to Understand Mathematical Concepts and Research with VBAMicrosoft Excel. CV. Trea Alea Jakarta Pedagogy.

Setiawan, D., Hartati, T., & Sopandi, W. (2020). The Effectiveness of the Critical Multiliteracy Model Using the RADEC Model on the Ability to Write Explanatory Text. EduHumaniora : Journal of Elementary Education, 12(1), 1–14.

Sopandi, W., Sujana, A., Sukardi, RR, Sutinah, C., Yanuar, Y., Imran, EM, Suhendra, I., Dwiyani, SS, Sriwulan, W., Nugraha, T., Sumirat, F ., Nurhayari, Y., Kusumastuti, FA, Lestari, H., Yuniasih, N., Nugraheny, DC, & Suratmi. (2021). RADEC Learning Model. UPI Press.

Sulaiman, I. (2022). Increasing Understanding of Rectangular Material Through Increasing Participation in Learning for Class III Students at SDI Barai 2, Ende District. Journal of Educational Literacy and Humanities, 7(2), 10.

Suryani, E. (2019). Concept Understanding Analysis? CV. Pillars of the Archipelago.

Wiguna, IBAA (2020). Effectiveness of Applying Hypnoteaching Methods in Increasing Student Learning Activities. LEARNER: Journal of Education, Teacher Training and Learning, 4(2), 66.

Yulianti, Y., Lestari, H., & Rahmawati, I. (2022). Application of the RADEC Learning Model to Improve Students' Critical Thinking Abilities. Pendas Cakrawala Journal, 8(1), 53.

Zuleni, E., & Marfilinda, R. (2022). The Influence of Motivation on Students' Understanding of Natural Science Concepts. Educativo: Journal of Education, 1(1), 244–250.