

Application of the Radec Learning Model to the Science Learning Outcomes of Grade IV Elementary School Students

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Abstract

Learning occurs through the process of interaction between students and educators and learning resources in a learning environment. This study aims to determine the completeness of student learning outcomes after the application of the RADEC Learning Model in the subject of Science for Grade IV Students of SD Negeri 72 Lubuklinggau. This research method uses a quantitative approach with a quasi-experiment using a pre-test and post-test research design. Using multiple choice questions totaling 18 questions. The research sample was grade IV consisting of 24 students. The research data analysis technique used a normality test and a Z-test with a confidence level of 5%. The results showed that based on data analysis, it was known that the results of the initial ability test (pre-test) had an average of 47.12 and the final ability test (post-test) had an average of 72.45. This shows that the average value of the final ability (post-test) was greater than the initial test. After calculating using the Z-test, the calculated Z value was 3.03 and the Z table value was 1.64. When compared, the calculated Z value \geq Z table. Therefore, it can be concluded that the science learning outcomes of fourth-grade students at SD Negeri 72 Lubuklinggau after implementing the RADEC Learning Model were significantly improved.

Keywords

Implementation, Learning Outcomes, RADEC.



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INTRODUCTION

Learning occurs through the interaction between students, educators, and learning resources within a learning environment. Learning is the assistance provided by educators to facilitate the acquisition of knowledge, mastery of skills and habits, and the formation of attitudes and beliefs in students. In other words, learning is a process designed to help students learn effectively (Sutianah, 2022:10). The primary goal of learning focuses on helping students acquire the knowledge and skills necessary to address real-life problems and situations, as well as developing positive attitudes and values (Tarumasely, 2022:10). In the learning process, educators (teachers) are required to determine learning models appropriate to the students' situations and conditions to achieve success in learning. This success is

achieved by students being able to construct science concepts in their own language, applying them in everyday life, and solving science problems they encounter (Sudarsana, 2018:8).

Natural and Social Sciences (IPAS) is one of the curriculum developments, which combines natural science and social science materials into one theme in learning Suhelayanti, et al (2023:30). The combination of these two subjects is done because the knowledge of elementary school students is still at a concrete/simple stage, so that the discussion of the material in the IPAS subject is still around general natural phenomena such as living things and inanimate objects in nature and related to human life as social beings (Farhan., et al, 2025:281). IPAS learning itself has the aim of developing basic skills in studying natural sciences and social sciences. Schools can provide teaching and learning activities for each subject or continue thematic programs that focus on developing the Pancasila Profile character in students (Hayudinna & Muzkiyah, 2024: 2439).

The science and science learning process should utilize a learning model, as this learning model is a method used to apply existing teaching methods through activities within the teaching and learning process to achieve predetermined or agreed-upon educational targets. One step in a teaching model is the carefully prepared teaching material, which is then delivered by educators, who, of course, utilize facilities to support the teaching and learning process (Akrim, 2022: 72). The learning model serves as a guide for the implementation of learning for educators and students (Jaliniua, et al., 2023: 185). This means that the learning model can be used as an instrument to drive learning activities. The primary function of the learning model is as a tool to achieve learning objectives, by referring to the core components that must be present in it, thus helping teachers and students achieve learning objectives. The benefits of using learning models, apart from achieving learning objectives, include for educators, students, and supervisors.

Based on the results of observations and interviews with the homeroom teacher of grade IV of SD Negeri 72 Lubuklinggau on October 8, 2025, information was obtained that the results of learning science in most students have not reached the Learning Objectives Achievement Criteria (KKTP) which was set at 65. Of the 24 students, only 9 students (37.5%) achieved completeness with an average score of 72, while 15 students (62.5%) have not completed, with an average score of 50.93. The low learning outcomes of students in learning science are influenced by the dominance of the lecture method which tends to make the learning process passive and minimal student involvement, so that understanding of the material is less than optimal and causes boredom in the classroom; several studies show that the lecture method, although effective in delivering material directly, often does not support active involvement and the development of critical thinking of students because of the dominance of teachers in delivering information without much student interaction. To address this, more recent educational research shows that student-centered learning strategies significantly improve conceptual understanding, critical thinking skills, motivation, and student engagement compared to traditional lecture approaches because students are actively involved in the learning process through discussion, exploration, and reflection. Therefore, the

implementation of more varied and student-centered learning models is necessary to improve student engagement, motivation, and learning outcomes in science (Hafidzoh E., Q., & Setiani H, 2025).

To address this issue, teachers need to implement learning strategies or models that can motivate and foster student learning engagement in science, one of which is the Read, Answer, Discuss, Explain, and Create (RADEC) model. The RADEC learning model is an alternative learning model suited to Indonesian conditions. This model is the latest breakthrough in education, which aims to achieve 21st-century competencies, character, and literacy, along with preparation for school and university-administered exams (Fauziani et al., 2021). In line with the above opinion, Suardi & Bancong (2025) stated that the RADEC learning model encourages students to learn independently and actively, develop advanced skills, and develop collaboration and communication skills to better understand the material.

Previous research indicates that the application of the RADEC learning model is still limited to specific learning contexts and has not been widely applied to science subjects in elementary schools. Research conducted by Esti Dwi Amelia (2021) applied the RADEC learning model to science lessons on How We Live and Grow in grade 5B elementary schools, with student learning outcomes as the variable. Furthermore, research by Sabila Idzni Suryana (2023) examined the application of the RADEC model to science lessons on Ecosystems in grade 5 with the aim of improving student science learning outcomes. Furthermore, Nur Azizah (2021) examined the effect of the RADEC learning model on science learning outcomes in grade 3 students on the topic "Energy Around Me." However, this research was limited to grade 4 elementary school and science subjects, so further study is needed in different grades and materials. Therefore, this study focuses on the application of the RADEC learning model to the science learning outcomes of fourth-grade students at SD Negeri 72 Lubuklinggau.

Based on the background above, the research problem is formulated as follows: Are the science learning outcomes of fourth-grade students at SD Negeri 72 Lubuklinggau significantly improved after the RADEC learning model is implemented? Based on the formulation of the problem above, the purpose of this study is to determine the completeness of the science learning outcomes of fourth-grade students at SD Negeri 72 Lubuklinggau after the RADEC learning model is implemented. This will provide the researcher with the necessary tools to become a professional educator by implementing the RADEC learning model appropriate to the subject matter.

METHODS

The type of research used was experimental research. Sugiyono (2018:72) stated that the experimental method used in this study was carried out without a comparison class, with only one class. The design used was a one-group pretest-posttest design, meaning there were only two sets of data: a pretest (O_1) and a posttest (O_2).

Table 1. Experimental Design: Pre-Test and Post-Test

Pre-test	Treatment	Post-test
O1	X	O2

O1 X O2

Description:

O1 = Pre-test (Before treatment)

X = Treatment (using the RADEC learning model)

O2 = Post-test (after treatment).

This research was conducted on fourth-grade students of SD i23 i Tebing Tinggi, located in Lubuk Binjai Village, South Lubuklinggau District 1, Lubuklinggau City. The research period is the even semester of 2025/2026. The population in this study is all fourth-grade students of SD Negeri 72 Lubuklinggau in the 2025/2026 academic year. Sugiyono (2025:85) Sampling uses saturated sampling technique. Saturated sampling is a sampling technique when all members of the population are used as samples. This is often done when the population is relatively small, less than 30 students, or research that wants to make generalizations with very small errors. The sample in this study is 24 fourth-grade students who are used to be given tests and treatments using the RADEC model. The data collection technique in this study uses the test technique. Sugiyono, (2017:224) data collection technique is the most strategic step in research because the main objective of research is to obtain accurate data. Without knowing the data collection techniques, researchers will not obtain data that meets the established standards. The use of the test is to find out the learning outcomes of students after the RADEC learning model is applied.

According to Sugiono (2017:333) In quantitative research, the data analysis techniques that can be used are clear, they are directed to answer the formulation of the problem or test the hypothesis that has been formulated in the thesis. The data analysis techniques carried out in this study are as follows:

Test Analysis Requirements

Determining the Mean Value and Standard Deviation

The mean values and standard deviations for quantitative data in the initial test (pre-test) and Final Test (post-test) with the following formula:

(Sugiono, 2017:55)

$$\bar{x} = \frac{\sum f X_i}{n}$$

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

(Sugiyono, 2017:57)

Description:

\bar{X} : Mean (track-track)

x_i : Value x to i to n

n : Number of Samples

s : Baku Junction

Data Normality Test

This normality test is used to see the normality of the data, whether the data to be analyzed is normally distributed or not. To perform the normality test, the formula χ^2 (chi squared) is used, namely:

$$\chi^2 = \sum_{i=1}^k \left(\frac{(f_o - f_e)^2}{f_e} \right) \quad (\text{Riduwan, 2020:190})$$

Description:

χ^2 : Chi Square

f_o : Observed frequency

f_e : Expected frequency

Sugiyono (2016:243), that χ^2 tables compared to χ^2 calculate with degrees of freedom (dk) = $k - 1$, where k is the number of data interval classes with a significance level of 5%. If χ^2 counts < χ^2_{table} then it can be stated that the data is normally distributed. If χ^2 counts $\geq \chi^2_{table}$, then it can be stated that the data is not normally distributed.

Uji Hypothesis

The statistical hypothesis test in this study is to test the difference in mean, in this case the initial data and the final data used to analyze the zero (H_0) hypothesis and the alternative hypothesis (H_a) are as follows:

H_0 : The average post-test score of the IPAS learning outcomes of grade IV students of SD Negeri 72 Lubuklinggau after participating in social studies learning using the RADEC learning model was significantly incomplete ($\mu_0 < 65$).

H_a : The average score of social studies learning outcomes of grade IV students of SD Negeri 72 Lubuklinggau after participating in social studies learning using the RADEC learning model was significantly complete ($\mu_0 \geq 65$).

If the two data are normally distributed and the standard deviation is also known, (theory) then the statistical test used is the z-test with the following formula:

$$Z_{count} = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}} \quad (\text{Riduwan, 2020:207})$$

Description:

Zhitung: The price calculated and shows the standard value of the deviation at the normal distribution (Table Z)

\bar{x} : The average value obtained from the results of data collection

μ_0 : Hypothesized average value

σ : Standard deviation of the known population

N: Number of study samples.

The test criterion is that if $Z_{hitung} < Z_{tabel}$, then H_0 is accepted and H_a is rejected. If $Z_{hitung} \geq Z_{tabel}$ then, H_0 is rejected and H_a is accepted. With its significance is ($\alpha = 0.05$).

RESULTS AND DISCUSSION

Pre-test Result Data

The pre-test was held at the first meeting, held on April 16, 2026 in grade IV which was attended by 24 students. The pre-test is carried out to determine the students' initial ability to science lessons, before being treated with the application of the Radec, Answer, Discuss, Explain and Create (RADEC) learning model. The pre-test questions used are multiple-choice consisting of 18 questions. Descriptively, it can be concluded that the initial ability of grade IV students of SD Negeri 72 Lubuklinggau before the implementation of IPAS learning by applying the RADEC learning model is included in the incomplete category, because the average score is less than the Learning Goal Achievement Criteria (KKTP) that have been implemented.

Post-test Result Data

The post-test was held at the last meeting, the post-test was carried out on April 20, 2026 in grade IV of SD Negeri 72 Lubuklinggau which was attended by 24 students. Post-test is carried out to determine the final ability of students in IPAS learning, after being treated with the application of the RADEC learning model. The post-test questions used were multiple-choice consisting of 18 questions.

Based on table 4.2, it can be seen that the average post-test score is 72.4 and 21 students or 87.5% have been completed. This shows that the fourth grade students of SD Negeri 72 Lubuklinggau can be said to be complete because the average score obtained from the final test reaches or exceeds the KKTP score, which is 65. Based on table 4.2 above, it can be descriptively concluded that the final ability of students in grade IV of SD Negeri 72 Lubuklinggau in 2025/2026 after the implementation of IPAS learning using the RADEC learning model in the significant category is complete.

When compared to the pre-test data, the average score obtained by students increased by 25. In the pre-test, there were no or 0% of students who completed and in the post-test there were 21 or 87.5% of students who completed after participating in IPAS learning by applying the Read, Answer, Discuss, Explain, and Create (RADEC) learning model.

The graph of the results of the pre-test and post-test that has been obtained is as follows

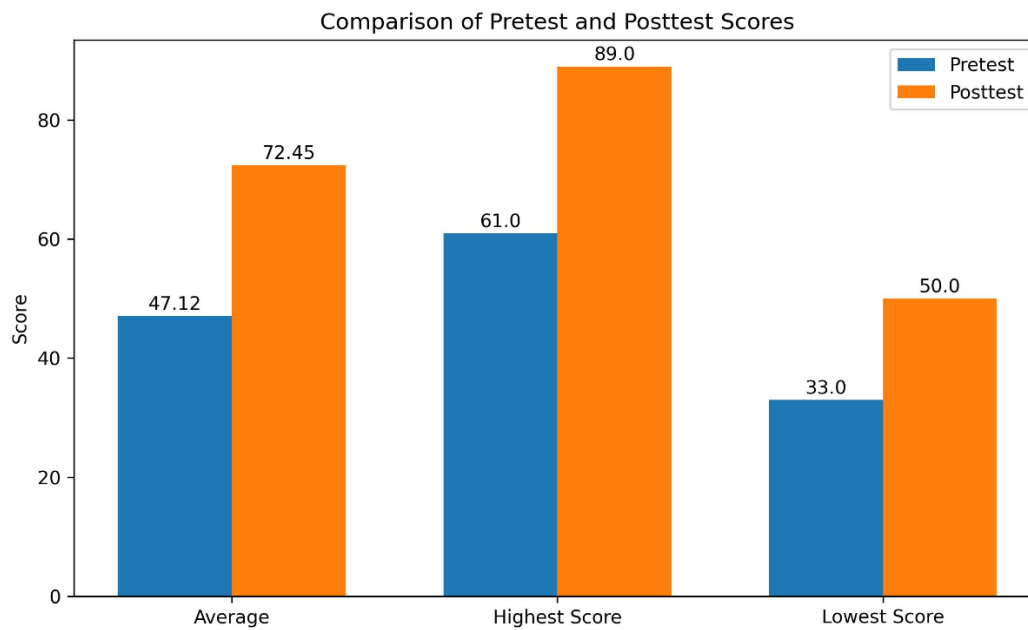


Figure 1. Comparison Graph Average score, highest score, and lowest score Pre-test and Post-test

Based on figure 4.1, it can be seen that in the pre-test, the average score of students is 47.12 and for the post-test score is 72.45. This shows an increase in the average score of students from pre-test to post-test by 25.33. Meanwhile, the number of students who completed the pre-test was 0 students or none completed with a percentage of 0% and in the post-test data, the number of students who completed was 21 people with a percentage of completeness of learning outcomes of 87.5%.

The research data obtained from the post-test results was used to test statistically. The hypothesis in this study is "The learning outcomes of IPAS students in grade IV of SD Negeri 72 Lubuklinggau after the application of the RADEC learning model is significantly complete" in this hypothesis test, the static hypothesis test uses a one-party z-test because the sample in the study is a saturated sample (population = sample). If $Z_{count} > Z_{tabel}$ then H_0 is rejected and H_a is accepted as the truth.

Normality Test

To determine the normality of the data, a normality test with a χ^2 (Chi squared) match test was used. Based on the provisions regarding the normality test of data with a significant level = 0.05, If $\alpha \chi^2_{counts} \leq \chi^2_{tables}$, then each data is distributed normally.

Uji Hypothesis

Based on the results of the data calculation, the results of the hypothesis test for the post-test data can be seen in the table below.

Table 2. Recapitulation of Post-test Hypothesis Test Results

Tests	Z _{hitung}	Z _{table}	Remarks
Post-test	3,03	1,64	Z _{hitung} > Z _{tabel} , Ha accepted

Based on the results of the calculation, $Z_{cal} = 3.03$ was obtained. Next, compare Z_{cal} with Z_{table} on the z distribution list with a significant level ($Z_{\alpha} = 5\%$) is obtained table 1.64. The test criterion is that if $Z_{cal} > Z_{table}$, then H_0 is rejected and H_a is accepted. if $Z_{cal} < Z_{table}$, then H_0 is accepted and H_a is rejected. Based on the calculation above, $Z_{cal} > Z_{table}$ ($3.03 > 1.64$) were obtained, so H_0 was rejected and H_a was accepted. The learning outcomes of IPAS students in grade IV of SD Negeri 72 Lubuklinggau after the implementation of the RADEC learning model were significantly complete.

This research was conducted at SD Negeri 72 Lubuklinggau in the 2025/2026 school year. This study is a quantitative research with a pre-experimental design, one group pre-test and post-test categories which aims to determine the completeness of learning outcomes after the application of the RADEC learning model in the learning of science science students in grade IV of SD Negeri 72 Lubuklinggau. The implementation of research learning with pre-test activities is on April 16, 2026, the material presented is about chapter 7 topic A "Me and My Needs". Based on the results of the recapitulation of students who obtained the highest score of 61 and the lowest score of 33, the average score was 47.12, then the student learning results at the time of the pre-test were 0 students who completed. This means that no student has achieved KKTP scores. After that, it was continued with social studies learning by applying the RADEC learning model on April 17-18, 2026, where this model is designed to create an interactive and cooperative learning environment, encourage students to collaborate and actively participate, and improve their understanding through the process of reading, answering, discussing, explaining the results of discussions, and creating or sharing creative ideas with fellow friends or classmates.

At the second meeting which was held on April 17, 2026, treatment was given by applying the Read, Answer, Discuss, Explain, and Create (RADEC) learning model in the sample class. Before learning, mention the learning topic and learning objectives to be achieved. Then the researcher explained the material "me and my needs" briefly, then the researcher gave instructions to take out a book and pen to record what they learned from the material in order to build critical thinking of students at the beginning. After the students finished the small notes, the researcher explained the steps of the RADEC learning model, in the activity the researcher distributed the LKPD sheet which contained each step of the model itself such as text or reading materials for the reading syntax , containing comprehension questions based on the reading text that had been read to be answered in writing on the LKPD sheet that had been provided, then students are divided into several groups of 4-5 people to discuss in front of the class, then continue with each group explaining the results of the discussion obtained to other groups. After the discussion was closed, the researcher provided an LKPD sheet for syntax (create) individually students were asked to make or create creations in the form of images or posters as attractive as possible. In the final stage, the researcher

reinforces the material that has been delivered by the students and conveys the material that has not been delivered. In the learning process, students are encouraged to learn independently, think critically, actively discuss, and be able to explain and create knowledge in an applicative manner. In this case, the role of teachers in teaching and learning is as a facilitator, guide, and motivator, because the role of teachers is very important to support the active involvement of students so that the learning process takes place effectively and meaningfully in learning activities.

In the first learning activity using the Read, Answer, Discuss, Explain, and Create (RADEC) learning model, they were still confused about doing the group learning activities at the time of the discussion activity so that students had not carried out their duties optimally, this caused the class to be less conducive because there were some students who were still busy playing with their friends. The solution that the researcher took was by going around to each group and providing assistance and guidance to students who felt difficult and confused about conducting group discussions so that students carried out their duties well. At the first meeting, the group discussion went quite well even though there were still some students who felt difficult and were not confident to express their opinions.

In the third meeting, held on April 18, 2026, this meeting still uses the application of the Read, Answer, Discuss, Explain, and Create (RADEC) learning model with the same group in the first treatment. At the beginning of learning, the researcher focuses the students' attention first so that students can focus during the learning process by providing ice breaking and questions related to the previous material to recall the material that has been learned. After that, the researcher continued the material given in the first treatment, namely "me and my needs". At this meeting, the researcher gave instructions to provide writing tools such as books, pens, or pencils to work on the LKPD and during the learning process, just like in the first treatment, the researcher briefly explained the previous material to the students, then distributed the reading text to be read again carefully and the LKPD sheet to be worked on or answered individually, followed by a group discussion and each group advanced to explain again or presenting the material presented, and other groups may provide questions and opinions. Then the researcher gave the next instruction, namely, for reflection on learning to work on the LKPD sheet to provoke creativity and knowledge known from the material in the second treatment to create based on their knowledge in a more interesting way. At the meeting in the second treatment, the students' activeness was seen, when the researcher began to direct students in the discussion group learning activities, the students' cooperation was good enough and the other group could pay attention to the friends who were present in front. Likewise, when reading, answering, or working on the LKPD sheet, students are more orderly and efficient when doing it, almost all students experience development following the course of learning enthusiastically and are able to think critically during discussions and presentations.

After completing several meetings, problems or obstacles were found in the implementation of the RADEC learning model. These obstacles are that some students are not

interested in participating in the applied learning, some students look bored because the chosen group is not in accordance with their wishes, and there are still students who are afraid to ask and answer questions and are still afraid to express opinions in groups. The solution to overcome this is that the author approaches students by inviting students to sing and play, namely by ice breaking, so that students who previously looked bored become interested and excited and make classroom conditions cheerful. In addition, another solution is to motivate students to be enthusiastic about learning by providing advice and encouragement so that students do not feel afraid in learning.

Based on this explanation, it can be concluded that the RADEC learning model can complete the learning outcomes of science students in grade IV of SD Negeri 72 Lubuklinggau. In addition, this RADEC learning model can increase students' enthusiasm for learning in science subjects and make students actively involved in the learning process. The results of the study are in line with previous research showing that the RADEC learning model is able to significantly improve student learning outcomes. Research by Sopandi (2017) states that the application of the RADEC model can improve students' understanding of concepts because learning activities begin with reading and answering questions so that students have initial readiness before learning takes place. The results of the study showed a significant increase in students' cognitive learning outcomes to achieve completeness.

Furthermore, research conducted by Setiawan, et al (2021) shows that the application of the RADEC model has a positive influence on student learning outcomes with a significantly increased level of learning completeness after learning is implemented. The RADEC learning model has the advantages of increasing learning readiness, active student involvement, critical thinking skills, and helping teachers implement 21st century learning systematically. Based on the study, it can be concluded that the RADEC learning model is effective in significantly improving student learning outcomes and achieving learning completeness, this is evidenced by the increase in scores in Figure 4.1 of the comparison graph of average scores, highest scores, and lowest scores in pre-test and post-test data.

Based on the discussion above, data was obtained on the number of students who scored more than 65 (complete) in the post-test (final test) as many as 21 students (87.5%) and those who scored less than 65 (incomplete), namely 3 students (12.5%). The highest score is 89 and the lowest is 50. The overall average of the post-test data is 72.45 with a standard deviation of 12.07 and Zcal 3.03, so that the data is distributed normally. This means that the learning outcomes of grade IV students of SD Negeri 72 Lubuklinggau after the application of the RADEC learning model to the learning outcomes of IPAS are significantly complete.

CONCLUSION

Based on the results of the research that has been conducted, the average pre-test result score is 47.12 and the number of students who achieve the Learning Goal Achievement Criteria (KKTP) score is non-existent or 0% of 24 students. Meanwhile, the average post-test result score was 72.45 and the number of students who achieved the Learning Goal Achievement

Criteria (KKTP) score was 24 students or 87.5% of 24 students. The results of the z-test analysis obtained the value of $Z_{hitung} (3.03) \geq Z_{tabel} (1.64)$. Therefore, it can be concluded that the learning outcomes of IPAS students in grade IV of SD Negeri 72 Lubuklinggau for the 2025/2026 school year after participating in IPAS learning with the RADEC learning model are significantly complete.

Based on some findings from the research results, it can be suggested that the next researcher is expected to develop research using the RADEC learning model on different materials and education levels in order to obtain broader and deeper results.

REFERENCES

- Adha, M, J., Aryani, Z., *et al.* (2025). Peningkatan Hasil Belajar Ilmu Pengetahuan Alam dan Sosial (IPAS) Menggunakan Model Pembelajaran Kooperatif Tipe Jigsaw di Kelas V SD Negeri 133/III Pondok Siguang. *Jurnal Multidisiplin Ilmu*, 3 (1), 325-331.
- Akrim. (2020). *Desain Pembelajaran*. Depok: PT RajaGrafindo Persada.
- Akrim. (2022). *Buku Ajar Strategi Pembelajaran*. Medan: Umsu Press
- Amelia, D, J. (2019). *Media Pembelajaran SD Berorientasi Multiple Intelligences*. Malang: UMMPress.
- Amelia, E. D., Imran, M. E., & Anisa, A. (2024). Pengaruh Model Pembelajaran RADEC (Read, Answer, Discussion, Explain, and Create) Terhadap Kemampuan Berpikir Kritis Peserta Didik Kelas V pada Pembelajaran IPA SD Inpres Pattallassang. *Journal on Education*, 6(3), 17890-17901.
- Amral & Asmar. (2020). *Hakikat Belajar dan Pembelajaran*. Bogor: Guepedia.
- Andryannisa, M. A. Z., Wahyudi, A. P., & Sayekti, S. P. (2023). Upaya meningkatkan hasil belajar siswa dengan menggunakan metode resitasi pada mata pelajaran akidah akhlak di sd islam riyadhul jannah depok. *Jurnal Pendidikan Sosial dan Humaniora*, 2(3).
- Arikunto, Suharsimi. (2013). *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: PT. Rineka Cipta.
- Aurelia, B. F., Sufa, F. F., & Jumanto, J. (2024). Pengaruh Penerapan Model Pembelajaran (Radec) terhadap Kemampuan Berpikir Kreatif pada Mata Pelajaran IPAS Kelas 4 SD. *Jurnal Basicedu*, 8 (5), 3703-3712.
- A'yun, Elis Qurota, *et al.* "Analisis Model Pembelajaran Direct Instruction dengan Metode Ceramah." *Didaktik: Jurnal Ilmiah PGSD STKIP Subang* 11.02 (2025): 230-239.
- Effendi, Ramlan. (2021). Konsep Revisi Taksonomi Bloom dan Implementasinya pada Pelajaran Matematika SMP." *JIPMat* 2.1.
- Emi, E. (2024). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Hasil Belajar Siswa Kelas V Pada Mata Pelajaran Ipas Di Sdn 03 Bengkayang. *Jurnal Pendidikan Dan Keguruan*, 2(3), 580-591.
- Fahrurrozi, *et al.* (2022). *Model-Model Pembelajaran Kreatif dan Berpikir Kritis di Sekolah Dasar*. Jakarta: Unj Press.
- Faizah., H., & Kamal., R. (2024). Belajar dan Pembelajaran. *Jurnal Basicedu.*, 8 (1), 466-476.

- Farhan, M., & Taofik, D. A. S. (2025). Penerapan media pembelajaran berbasis puzzle sugam untuk meningkatkan hasil belajar ipas siswa kelas v sekolah dasar. *Jurnal Ilmiah Pendidikan Dasar*, 10 (2), 2548-695
- Hayudinna, H. G., & Muzkiyah, A. (2024). Analisis Kemampuan Bernalar Kritis pada Pembelajaran Ilmu Pendidikan Alam dan Sosial (Ipas) dalam Kurikulum Merdeka di Sekolah Dasar. *Jurnal Basicedu*, 8(3), 2438-2447.
- Hernita, H., & Dharma, S. (2023). Studi Literatur: Pemanfaatan Model Radec terhadap Keterampilan Berpikir Tingkat Tinggi dalam Pembelajaran Pkn di Sekolah Dasar. *Journal on Education*, 6(1), 5918-5927.
- Iwanda, C. N. S., Malika, H. N., & Aqshadigrama, M. (2022). RADEC Sebagai Inovasi Model Pembelajaran Pendidikan Agama Islam Pasca Pandemi Covid-19 Di Sekolah. *Jurnal Ilmiah Wahana Pendidikan*, 8(24), 430-440.
- Jakni. (2016). *Metodologi Penelitian Eksperimen Bidang Pendidikan*. Bandung: Alfabeta.
- Jalinus., N., Syahril., Sukardi., et al. (2023). *Pedagogi Kejuruan; Kompetensi Guru dan Kompleksitasnya*. Yogyakarta: Deepublish Digital.
- Kaharrudin, A. (2020). *Pembelajaran Inovatif & Variatif*. Gowa: Pusaka Almaida.
- Kustirini., Sarwi., Purnamasari, V., et al. (2024). *Inovasi Pembelajaran Berbasis Literasi Sains Mendukung Penguatan Life Skills Siswa SD/MI*. Semarang: Cahaya Ghani Recovery.
- Mahmud. (2011). *Metode Penelitian Pendidikan*. Bandung: Pustaka Setia.
- Mahsun, A., Hadiyani P, A., Fithriyah, M., et al. (2023). *IPS Kependidikan Dasar*. Lamongan: Nawa Litera Publishing.
- Mahtumi, I., Purnamaningsih, I, R., Purbangkara, T. (2022). *Pembelajaran Berbasis Proyek (Projects Based Learning)*. Ponorogo: Uwais Inspirasi Indonesia.
- Manganggantung., J, M. (2023). *Kompetensi Pedagogik Dalam Peningkatan Kualitas Pendidikan*. Yogyakarta: Deepublish Digital.
- Mu'in. (2024). *Langkah Tepat Meningkatkan Hasil Belajar Siswa Menggunakan Video Pembelajaran*. Lombok Tengah: Pusat Pengembangan Pendidikan dan Penelitian Indonesia.
- Mustadi., A. (2020). *Landasan Pendidikan Sekolah Dasar*. Yogyakarta: Uny Press.
- Pohan., E, A. (2020). *Konsep Pembelajaran Daring Berbasis Pendekatan Ilmiah*. Purwodadi: CV Sarnu Untung.
- Pulukadang, W, T. (2021). *Buku Ajar Pembelajaran Terpadu*. Gorontalo: Ideas Publishing.
- Riduwan. (2020). *Rumus dan Data dalam Analisis Statistika*. Bandung: Alfabeta.
- Riinawati. (2020). *Monograf; Hubungan Penggunaan Mau odel Pembelajaran Blanded Learning Terhadap hasil Belajar Matematika*. Yogyakarta: Cv Kanhaya Karya
- Septiyaningsih., R., Reffy, P., Widyastuti., et al. (2023). *Media Pembelajaran Menunjang Kemampuan Belajar Peserta Didik SD*. Semarang: Cahaya Ghani Recovery.
- Setiawan, A., Rahman, T., & Nurlaelah, E. (2021). Implementasi model pembelajaran RADEC untuk meningkatkan hasil belajar IPA siswa sekolah dasar. *Jurnal Pendidikan Dasar*, 12(1), 45-54.
- Sopandi, W. (2017). The quality improvement of learning processes and achievements through

- the Read-Answer-Discuss-Explain-Create (RADEC) learning model. Proceedings of International Conference on Elementary Education, Universitas Pendidikan Indonesia.
- Sudarsana, I. K. (2018). Optimalisasi penggunaan teknologi dalam implementasi kurikulum di sekolah (persepektif teori konstruktivisme). *Cetta: Jurnal Ilmu Pendidikan*, 1(1), 8-15.
- Sugiyono, (2013). *Metode Penelitian Kombinasi (Mixed Methods)*. Bandung: Alfabeta.
- Sugiyono. (2017). *Metode Penelitian Pendidikan, Pendekatan Kuantitatif, Kualitatif dan R & D*. Bandung: Alfabeta, Cv.
- Sugiyono. 2018. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Suhelayanti., Syamsiah, Z., Rahmawati, I., et al. (2023). *Pembelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS)*. Medan: Yayasan Kita Menulis.
- Sutianah., C. (2022). *Belajar dan Pembelajaran*. Pasuruan: Cv. Penerbit Qiara Media.
- Sutrisno. (2020). *Meningkatkan Minat dan Hasil Belajar Tik Materi Topologi Jaringan Dengan Media Pembelajaran*. Malang: Ahlimedia Press.
- Tanjung., R. (2024). *Concept Sentence dan Pembelajaran IPS*. Banyumas: Wawasan Ilmu.
- Tarumasely., Y. (2022). *Buku Ajar Perencanaan Pembelajaran*. Lamongan: Academia Publication.
- Wahid., A. (2023). *Buku Ajar Konsep Dasar Pkn SD*. Yogyakarta: Samudra Biru.