

The Effectiveness Of The "BANDREC" Teaching Material Based On The RADEC Learning Model In Improving The Cultural And Civic Literacy Of Phase A Students On The Material On Pancasila Values And Symbols

Hamba Wizaksana^{1*}, Cicih Sutarsih²

^{1,2}Department of Education, Universitas Pendidikan Indonesia, Bandung City, and Indonesia

*hambawizaksana@upi.edu

Abstract. This study aims to examine the effectiveness of the "BANDREC" teaching materials based on the RADEC learning model in improving cultural and civic literacy among Phase A students in the subject of Pancasila values and symbols. The method used is a quantitative pre-experimental study with a one-group pretest-posttest design. The research subjects were second-grade elementary school students in Bandung. The results showed a significant improvement in students' cultural and civic literacy after using the "BANDREC" teaching materials. The average pre-test score of 28.22 increased to 70.78 in the post-test. Statistical analysis indicates that teaching materials based on the RADEC learning model are effective in enhancing students' understanding of Pancasila values and symbols. These findings suggest that the use of interactive RADEC-based teaching materials can serve as a relevant learning strategy to strengthen students' cultural and civic literacy.

Keywords: Teaching materials, cultural and civic literacy, Pancasila values and symbols, RADEC.

INTRODUCTION

According to the *Kamus Besar Bahasa Indonesia* (KBBI), literacy is defined as an individual's ability and skill in language that includes reading, writing, speaking, calculating, and solving problems at a certain level of expertise required in daily life. Another opinion states that literacy can be interpreted as the awareness within humans to think critically and creatively, based on the tradition of reading and writing (Maryati, I., 2018). According to Elizabeth Sulzby (in Giovanni, 2019), literacy is defined as a person's language ability to communicate in different ways according to their purposes. Based on the above definitions, it can be concluded that literacy is an individual's ability in language, which includes reading, writing, speaking, calculating, and problem-solving. Furthermore, literacy is also related to the awareness of critical and creative thinking, as well as the ability to communicate according to specific goals.

According to the Research and Development Agency of the Ministry of Education and Culture (Balitbang Kemendikbud, in Jaelani, 2022), basic literacy consists of: (1) language and literature literacy, (2) numeracy, (3) scientific literacy, (4) information and technology literacy, (5) financial literacy, and (6) cultural and civic literacy. Cultural and civic literacy refers to the

ability to love the homeland, have curiosity, tolerance, nationalism, responsibility, and discipline (Maimun et al., 2020). Another opinion states that cultural literacy is the ability to understand and behave toward Indonesian culture as a national identity, while civic literacy is the ability to understand one's rights and obligations as a citizen (Hardiansyah et al., 2017). Based on these opinions, it can be concluded that cultural and civic literacy not only reflect an understanding of culture and citizenship but also instill national values that shape individual character as responsible citizens.

Cultural and civic literacy play an important role in shaping students' character so that they understand the values of *Pancasila* as the foundation for behavior (Humaeroh, 2024). At the primary education level (Phase A), students begin to learn concepts such as togetherness, cooperation (*gotong royong*), and mutual respect in everyday life. Through a good understanding of *Pancasila* values including divinity, humanity, unity, deliberation, and justice students can develop caring attitudes, honesty, and respect for differences. This serves as the foundation for fostering love for the homeland and a sense of responsibility as citizens from an early age. According to Sofyan et al. (2025), such understanding is an essential element that must be instilled in students to form a generation that is not only academically intelligent but also socially aware of issues in their surroundings.

Observations conducted at one of the elementary schools in Bandung City revealed that many students were able to recite the *Pancasila* principles fluently but had difficulty providing real-life examples of each principle. For instance, they could recite the first principle, "Belief in the One and Only God," but were unable to explain practical examples such as respecting friends of different religions in daily life. Similar difficulties were observed with other principles: students could memorize the text but struggled to give concrete examples such as sharing with friends (second principle), playing together without discrimination (third principle), discussing and taking turns when speaking (fourth principle), or distributing tasks fairly within a group (fifth principle). These challenges indicate that their understanding remains theoretical and is not yet connected to real-life experiences. Therefore, it is necessary to develop more interactive and applicable teaching materials that help students understand and apply *Pancasila* in everyday life.

Teaching materials play an essential role in determining the quality of learning (Cahyadi, 2019). Without proper teaching materials, teachers may find it difficult to achieve learning objectives (Aisyah, 2020). According to Asriani (2017), teaching materials or learning content consist of knowledge, skills, and attitudes that must be learned in order to achieve predetermined

competency standards. Teaching materials are important as a source of knowledge and insight for students (Utami, 2021). According to Lestariningsih & Suardiman (in Gustiawati, 2020), the importance of teaching materials includes: (1) serving as teaching aids for teachers, (2) attracting students' attention through appealing designs and illustrations, (3) providing an innovative approach for teachers to adapt to various student characteristics, and (4) serving as a reference for teachers to improve future lessons. Therefore, teaching materials can be understood as tools that help students comprehend learning content effectively.

BANDREC (Teaching Materials Based on the RADEC Model) is a type of instructional material designed according to the RADEC syntax to enhance students' understanding and activeness in class. The Read, Answer, Discuss, Explain, and Create (RADEC) learning model encourages students to develop 21st-century skills and master the concepts being studied (Setiawan et al., 2019). The fundamental principle of the RADEC model is the belief that every student has the potential to learn independently, achieve higher levels of learning, and master various forms of knowledge and skills (Setiawan et al., 2022). According to Sopandi (in Muslihah, 2023), the RADEC learning model consists of five stages, which also represent the name of the model itself: Read, Answer, Discuss, Explain, and Create. The RADEC learning model can be implemented to facilitate the formation and strengthening of the Pancasila Student Profile within the Merdeka Curriculum (Anggraeni, 2024). Based on this background, this study aims to determine the effectiveness of "BANDREC" (Teaching Materials Based on the RADEC Model) in improving cultural and civic literacy among Phase A elementary school students.

METHODOLOGY

This study employed a quantitative pre-experimental research design using the one group pretest posttest design. Quantitative research is an investigation of social phenomena based on the testing of a theory composed of variables, measured numerically, and analyzed using statistical procedures to determine whether the predictive generalizations of the theory are valid (Ali et al., 2022). The pre-experimental method allows researchers to observe changes before and after a treatment is given to a single group of research subjects (Sugiyono, 2019). The research design used in this study is presented in Table 1.

Table 1. Pre-Experimental Research Design (One Group Pretest Posttest)

| Pretest | treatment | posttest |
|----------------|-----------|----------------|
| Y ₁ | X | Y ₂ |

The subjects of this study were second grade elementary school students in Bandung City. The data collection technique used in this research was a test technique. Data were collected through pre-tests and post-tests to determine the differences in students' learning outcomes before and after using the RADEC based teaching materials (Fraenkel & Wallen, 2017). The data analysis in this study included descriptive analysis and inferential analysis, which comprised the N-Gain test, normality test, homogeneity test, and mean difference test (*Paired Samples T-test*).

The instrument used to measure students' cultural and civic literacy consisted of 20 multiple choice items developed based on the indicators of understanding Pancasila values and symbols for Phase A students. The indicators covered: (1) identifying the meaning of Pancasila symbols, (2) recognizing examples of daily behavior aligned with each principle, and (3) distinguishing appropriate and inappropriate actions according to Pancasila values. Three sample items include: "*Which action reflects the second principle of Pancasila?*" and "*Which symbol represents the fourth principle of Pancasila?*". The instrument was validated by two experts in elementary education and Pancasila literacy, resulting in a content validity index (CVI) of 0.89, indicating high content relevance. A pilot test was conducted on 28 students outside the study sample, yielding a Cronbach's alpha coefficient of 0.82, which demonstrates good reliability and internal consistency.

RESULTS AND DISCUSSION

Overview of Students' Initial Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

The initial overview of students' cultural and civic literacy abilities can be seen from the pre-test results conducted before they received treatment using RADEC-based teaching materials. The pre-test aimed to identify the students' baseline understanding of Pancasila values and symbols prior to the implementation of the RADEC learning model. The descriptive statistics of the pre-test results are presented in Table 2 below:

Table 2. Descriptive Statistics of Pre-test Results on Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Descriptive Statistics | | | | | |
|-------------------------------|----|---------|---------|-------|----------------|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Pretest | 23 | 11 | 47 | 28.22 | 10.440 |
| Valid N (listwise) | 23 | | | | |

Based on Table 2, the total number of students who took the pre-test was 23, with a minimum score of 11 and a maximum score of 47. The average pre-test score representing students' cultural and civic literacy ability was 28.22. To determine whether the pre-test data were normally distributed, the Shapiro-Wilk normality test was conducted. The criteria for the normality test are as follows:

- If the significance value is greater than 0.05, the data are normally distributed.
- If the significance value is less than 0.05, the data are not normally distributed.

The results of the Shapiro-Wilk normality test for the pre-test of students' cultural and civic literacy in the topic of Pancasila values and symbols are presented in Table 3 below.

Table 3. Normality Test Results of Students' Pre-test Scores on Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Tests of Normality | | | | | | |
|---------------------------|---------------------------------|----|------|--------------|----|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Pretest | .177 | 23 | .060 | .933 | 23 | .125 |

a. Lilliefors Significance Correction

Table 3 shows that the significance value of the pre-test for students' cultural and civic literacy in the topic of Pancasila values and symbols, based on the Shapiro-Wilk normality test, is 0.125. Since the significance value of 0.125 is greater than 0.05, it can be concluded that the pre-test results of students' cultural and civic literacy in the topic of Pancasila values and symbols are normally distributed.

Final Description of Students' Cultural and Civic Literacy Ability in the Topic of Pancasila Values and Symbols

The achievement of students' cultural and civic literacy in the topic of Pancasila values and symbols can be observed through the post-test results conducted after the implementation of learning using RADEC-based teaching materials. The descriptive statistics of the post-test results are presented in Table 4 below.

Table 4. Descriptive Statistics of Post-test Scores of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Descriptive Statistics | | | | | |
|------------------------|----|---------|---------|-------|----------------|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Posttest | 23 | 52 | 88 | 70.78 | 10.596 |
| Valid N (listwise) | 23 | | | | |

Based on Table 4, the total number of students who participated in the post-test of cultural and civic literacy in the topic of Pancasila values and symbols using RADEC-based teaching materials was 23. The minimum score obtained from the post-test was 52, while the maximum score was 88. The average score achieved by students was 70.78. To determine whether the post-test data of students' cultural and civic literacy in the topic of Pancasila values and symbols are normally distributed, a Shapiro-Wilk normality test was conducted. The criteria for testing are as follows:

- If the significance value > 0.05 , the data are normally distributed.
- If the significance value < 0.05 , the data are not normally distributed.

Table 5 presents the results of the Shapiro-Wilk normality test for students' post-test scores of cultural and civic literacy in the topic of Pancasila values and symbols.

Table 5. Normality Test of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Tests of Normality | | | | | | |
|--------------------|---------------------------------|----|------|--------------|----|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Posttest | .159 | 23 | .134 | .936 | 23 | .149 |

a. Lilliefors Significance Correction

Table 5 shows that the significance value of the post-test for students' cultural and civic literacy in the topic of Pancasila values and symbols, based on the Shapiro-Wilk normality test, is 0.149. Since the significance value of the post-test result is $0.149 > 0.05$, it can be concluded that the post-test data of students' cultural and civic literacy in the topic of Pancasila values and symbols are normally distributed. After conducting the normality tests on both the pre-test and post-test results, which were found to be normally distributed, an additional analysis was carried out namely, the homogeneity test using Levene's Test.

Table 6. Homogeneity Test Results of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Tests of Homogeneity of Variances | | | | | |
|--|--------------------------------------|------------------|-----|--------|-------|
| | | Levene Statistic | df1 | df2 | Sig. |
| Hasil | Based on Mean | .000 | 1 | 44 | 1.000 |
| | Based on Median | .000 | 1 | 44 | 1.000 |
| | Based on Median and with adjusted df | .000 | 1 | 43.897 | 1.000 |
| | Based on trimmed mean | .000 | 1 | 44 | 1.000 |

Table 6 shows that the significance value of the homogeneity test is 1.000. Since this value is greater than the significance level of 0.05, the data can be considered homogeneous.

Effectiveness of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols Using RADEC-Based Teaching Materials

Table 7 below presents the descriptive statistics of the pre-test and post-test scores of students' cultural and civic literacy in the topic of Pancasila values and symbols using RADEC-based teaching materials.

Table 7. Descriptive Statistics of Pre-test and Post-test Scores of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Descriptive Statistics | | | | | |
|------------------------|----|---------|---------|-------|----------------|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Pretest | 23 | 11 | 47 | 28.22 | 10.440 |
| Posttest | 23 | 52 | 88 | 70.78 | 10.596 |
| Valid N (listwise) | 23 | | | | |

Based on Table 7, it can be seen that the average pre-test score was 28.22, while the post-test score was 70.78, showing an average increase of 42.56 points. The maximum score for the pre-test was 47, while the maximum post-test score reached 88. This indicates a clear improvement in students' cultural and civic literacy after using the RADEC-based teaching materials. To further examine the effectiveness of the RADEC-based teaching materials in improving students' cultural and civic literacy in the topic of Pancasila values and symbols, a mean difference test (Paired Samples Test) and gain normality test were conducted. The mean difference test was performed using a parametric Paired Samples Test, as both the pre-test and post-test data were normally distributed and homogeneous. The criteria for interpretation are as follows:

- If the significance value (p) < 0.05, there is a significant difference between the pre-test and post-test means.
- If the significance value (p) > 0.05, there is no significant difference between the pre-test and post-test means.

The results of the Paired Samples Test for students' cultural and civic literacy are presented in Table 8 below.

Table 8. Results of the Paired Samples Test for Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Paired Differences | | | | | | | Significance | |
|--------------------|---|----------------|-------|---|-------|---|--------------|-------------|
| | | Std. Deviation | | 95% Confidence Interval of the Difference | | t | df | Two-Sided p |
| Mean | n | Mean | Error | Lower | Upper | | | |
| | | | | | | | | One-Sided p |

| | | | | | | | | | | |
|--------|----------|---------|--------|-------|---------|---------|---|--------|-------|-------|
| Pair 1 | Pretest | -42.565 | 14.832 | 3.093 | -48.979 | -36.151 | - | 22 | <,001 | <,001 |
| | Posttest | | | | | | | 13.763 | | |

Table 8 shows that the mean difference between the pre-test and post-test scores was 42.565. The significance value (two-tailed) obtained was $p < 0.001$, which is smaller than the significance level of 0.05. Therefore, it can be concluded that there is a significant difference between the pre-test and post-test results for students' cultural and civic literacy in the topic of Pancasila values and symbols after using the RADEC-based teaching materials.

Table 9. Results of the N-Gain Test for Pre-test and Post-test Scores of Students' Cultural and Civic Literacy in the Topic of Pancasila Values and Symbols

| Descriptive Statistics | | | | | |
|------------------------|----|---------|---------|---------|----------------|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Ngain_score | 23 | .19 | .87 | .5858 | .16395 |
| Ngain_persen | 23 | 18.64 | 86.52 | 58.5756 | 16.39515 |
| Valid N (listwise) | 23 | | | | |

Table 9 shows that the obtained N-Gain score is 0.5858. Based on the effectiveness criteria proposed by Melzer (2008), the RADEC model demonstrates a moderate level of effectiveness in improving students' cultural and civic literacy in the topic of Pancasila values and symbols. In addition to the N-Gain results, the effect size was calculated using Cohen's d to further quantify the magnitude of improvement. The effect size value was $d = 3.20$, which falls into the category of a very large effect, indicating that the RADEC-based teaching materials had a substantial impact on enhancing students' cultural and civic literacy. This reinforces the interpretation that the observed improvement was not only statistically significant but also educationally meaningful.

Implementation of RADEC Based Teaching Materials

The implementation of RADEC-based teaching materials was carried out in the topic of values and symbols of Pancasila for second-grade elementary school students. According to Sopandi (in Muslihah & Nuriyanti, 2023), the RADEC learning model consists of stages that form its

name: Read, Answer, Discuss, Explain, and Create. The process of implementing the RADEC-based materials followed these stages sequentially. In the Read stage, students engaged in a pre-learning activity where they were given reading materials in the form of short stories about Pancasila values in the school and community environment. The next stage, Answer, required students to answer questions independently through activity sheets, demonstrating their ability to learn autonomously through reading (Tulljannah & Amini, 2021). The Discuss stage was then conducted by having students work in small groups of five to actively share ideas and analyze their responses collaboratively. Following this, during the Explain stage, each group presented the results of their discussions in front of the class, after which the class collectively agreed on the most accurate answers to be recorded in the main group column. Finally, in the Create stage, students were encouraged to express their understanding creatively by making individual daily journals that illustrated how they practiced Pancasila values in their daily lives, with decorations reflecting each student's creativity.

According to Kaharuddin (in Andini & Fitria, 2021), the RADEC model offers several advantages. It provides opportunities for teachers to design more engaging and creative learning experiences, enhances students' critical thinking abilities, improves analytical and reading skills, and fosters collaboration within groups. However, as noted by Yulisdiva (2023), the model also presents a challenge, as teachers must be highly meticulous in planning the learning process to ensure that each stage of the RADEC model runs effectively and achieves the intended learning outcomes.

Effectiveness Analysis of RADEC-Based Teaching Materials in Improving Cultural and Civic Literacy

The results of the study demonstrated a significant improvement in students' cultural and civic literacy after the use of RADEC-based teaching materials. The average pre-test score of 28.22 increased to 70.78 in the post-test, indicating that these materials effectively enhanced students' understanding of Pancasila values and symbols compared to conventional teaching methods. Statistical analysis using the Paired Samples Test revealed a significance value of less than 0.001, confirming a substantial difference between pre-test and post-test results. Furthermore, the N-Gain Test produced a score of 0.5858, which, according to Melzer's (2008) criteria, falls within the moderate level of effectiveness. These findings indicate that the RADEC-based teaching materials have a positive impact on improving students' cultural and civic literacy. However, there remains room for further enhancement, particularly in refining

implementation strategies to ensure that learning activities are more contextual, engaging, and aligned with students' real-life experiences.

Although the findings strongly demonstrate improvement in students' cultural and civic literacy, this study has limitations due to its one-group pretest–posttest design, which is vulnerable to several threats to internal validity. Factors such as maturation, testing effects, and external classroom events may have influenced students' scores independently of the intervention. Additionally, the absence of a comparison or control group limits the ability to attribute changes solely to the RADEC based teaching materials. Therefore, the results should be interpreted with caution, particularly regarding causal claims.

Future studies should consider using more rigorous designs such as quasi experimental approaches with control groups or cluster randomization across multiple schools to strengthen causal inferences. Including a larger and more diverse sample would also enhance generalizability. Further research could additionally investigate long-term retention, teacher readiness, and practical challenges in implementing BANDREC in varied classroom contexts.

CONCLUSION

Based on the results of the study, it can be concluded that the RADEC-based teaching material (BANDREC) is effective in improving cultural and civic literacy among Phase A students. This is evidenced by a significant increase in the pre-test and post-test results, where the average score rose from 28.22 to 70.78. The RADEC model, which consists of the stages Read, Answer, Discuss, Explain, and Create, has been proven to enhance students' conceptual understanding and the application of Pancasila values in their daily lives. The findings of this study show promising potential for wider implementation, although generalizability remains limited to similar classroom contexts. Practically, the BANDREC teaching material can serve as a structured guide for teachers to facilitate literacy-based learning using the RADEC model. The clear stages help teachers scaffold students' thinking processes while promoting active participation. However, successful implementation requires adequate teacher preparation, especially in designing reading prompts, discussion tasks, and creative outputs that are aligned with Pancasila literacy goals. Therefore, this teaching material is recommended as an alternative learning resource to instill national values and strengthen students' character from an early age.

REFERENCES

- Aisyah, (2020). Bahan ajar sebagai bagian dalam kajian problematika pembelajaran bahasa Indonesia. *Jurnal Salaka: Jurnal Bahasa, Sastra, Dan Budaya Indonesia*, 2(1).
- Andini, S. R., & Fitria, Y. (2021). Pengaruh Model RADEC pada Pembelajaran Tematik Terhadap Hasil Belajar Peserta Didik Sekolah Dasar. *Jurnal Basicedu*, 5(3), 1435–1443. <https://doi.org/10.31004/basicedu.v5i3.960>
- Asriani, P., & Sa'dijah, C. (2017). *Bahan ajar berbasis pendidikan karakter untuk siswa kelas IV sekolah dasar* (Doctoral dissertation, State University of Malang).
- Cahyadi, R. A. H. (2019). Pengembangan bahan ajar berbasis ADDIE model. *Halaqa: Islamic Education Journal*, 3(1), 35-42.
- Fraenkel, J. R., & Wallen, N. E. (2017). *How to Design and Evaluate Research in Education* (10th ed.). McGraw-Hill.
- Giovanni, F., & Komariah, N. (2019). Hubungan antara literasi digital dengan prestasi belajar siswa SMA Negeri 6 Kota Bogor. *Libraria*, 7(1), 147-162.
- Gustiawati, R., Arief, D., & Zikri, A. (2020). Pengembangan bahan ajar membaca permulaan dengan menggunakan cerita fabel pada siswa sekolah dasar. *Jurnal basicedu*, 4(2), 355-360.
- Hadiansyah, (2017). *Materi Pendukung Literasi Budaya dan Kewargaan*. Jakarta Timur: Kemendikbud.
- Humaeroh, (2024). Pentingnya Membangun Rasa Percaya Diri Siswa melalui Literasi Budaya dan Kewargaan di Sekolah Dasar. *ELSCO: Jurnal Pendidikan Guru Sekolah Dasar*, 2(1), 12-17.
- Jaelani, A. J. (2022). Literasi digital dan pembelajaran mandiri. In *Seminar Nasional Pendidikan Sultan Agung IV* (Vol. 3, No. 1).
- Maryati, I., & Priatna, N. (2018). Analisis kemampuan literasi statistis siswa Madrasah Tsanawiyah dalam materi statistika. *Journal of Medives: Journal of Mathematics Education IKIP Veteran Semarang*, 2(2), 205-212.
- Maimun, M., Sanusi, S., Rusli, Y., & Muthia, H. (2020). Internalisasi Nilai-nilai Karakter Kebangsaan Melalui Literasi Budaya dan Kewarganegaraan di Sekolah Menengah Atas (SMA) Kota Banda Aceh. *CIVICUS: Pendidikan-Penelitian-Pengabdian Pendidikan Pancasila dan Kewarganegaraan*, 8(1), 8-15.
- Melzer, A. (2008). Learning Effectiveness in Higher Education: The Role of Active Learning Strategies. *Educational Psychology Review*, 20(4), 469-493.
- Setiawan, (2019). Kemampuan menulis teks eksplanasi dan penguasaan konsep siswa sekolah dasar melalui implementasi model pembelajaran RADEC. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 9(2), 130. <https://doi.org/10.25273/pe.v9i2.4922>
- Setiawan, et al., (2022). Keterampilan Berfikir Kritis Pada Pembelajaran IPA Menggunakan Model Pembelajaran Radec di Sekolah Dasar : Systematic Literature Review. *Justek : Jurnal Sains Dan Teknologi*, 5(2), 133. <https://doi.org/10.31764/justek.v5i2.11421>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

- Sofyan, S., Kurniawan, M. B., Octarina, H., Sahusilawane, N. A., Safira, A., Sulastri, T., Yusnaldi, E., Negeri, I., & Utara, S. (2025). *Jurnal mudabbir*. 5, 258–268.
- Tulljanah R., dan Amini, R. (2021). Model Pembelajaran RADEC sebagai Alternatif dalam Meningkatkan Higher Order Thinking Skill pada Pembelajaran IPA di Sekolah Dasar: Systematic Review *Journal of Elementary education*. Vol 5, No6
- Utami, N., & Atmojo, I. R. W. (2021). Analisis kebutuhan bahan ajar digital dalam pembelajaran ipa di sekolah dasar. *Jurnal Basicedu*, 5(6), 6300-6306.
- Yulisdiva, (2023). Perbandingan Model Pembelajaran Read, Answer, Discuss, Explain, and Create (RADEC) dengan Model Pembelajaran Inquiry terhadap Kemampuan Berpikir Tingkat Tinggi Siswa pada Materi Gaya. *JESA-Jurnal Edukasi Sebelas April*, 7(1), 16-25.