



IMPROVING STUDENTS' LEARNING OUTCOMES AND LEARNING MOTIVATION IN LIGHT MATERIAL THROUGH A CULTURALLY RESPONSIVE TEACHING APPROACH

Moch. Bachrul Ulum¹, Elsa Munawarotul Jannah², Dwi Amiliatuz Zaqiyah³, Maryani⁴

^{1,2,3,4}University of Jember

ppg.elsajannah06@program.belajar.id

Abstract

This two-cycle Classroom Action Research (CAR) aims to improve the motivation and science learning outcomes of class VIII-A students at SMPN 3 Jember through the application of the CRT approach. The results of the study prove the CRT approach is effective in improving both aspects. The improvement in learning outcomes is seen from the average posttest score which increased from 85.45 (Cycle I) to 89.39 (Cycle II). Student learning completeness increased significantly, namely in Cycle I from 12.12% (pretest) to 90.91% (posttest) and in Cycle II, from 15.15% (pretest) to 93.94% (posttest). In line with previous research, these results prove that CRT-based contextual-culturally responsive learning is able to improve motivation and science learning outcomes. In addition, this research supports the implementation of the Independent Curriculum in creating an inclusive learning environment for diverse students and can be a reference for teachers in implementing adaptive learning strategies with the CRT approach to face the challenges of a dynamic learning environment.

Keywords: Culturally Responsive (CRT), learning outcomes and learning motivation.

Abstrak

Penelitian Tindakan Kelas (PTK) dua siklus ini bertujuan meningkatkan motivasi dan hasil belajar IPA peserta didik kelas VIII-A di SMPN 3 Jember melalui penerapan pendekatan Culturally Responsive Teaching (CRT). Hasil penelitian membuktikan bahwa pendekatan CRT efektif meningkatkan kedua aspek tersebut. Peningkatan hasil belajar terlihat dari nilai rata-rata posttest yang meningkat dari 85,45 (Siklus I) menjadi 89,39 (Siklus II). Ketuntasan belajar peserta didik meningkat secara signifikan, yaitu pada Siklus I dari 12,12% (pretest) menjadi 90,91% (posttest) dan pada Siklus II, dari 15,15% (pretest) menjadi 93,94% (posttest). Sejalan dengan penelitian terdahulu, hasil ini membuktikan bahwa pembelajaran kontekstual-responsif budaya berbasis CRT mampu meningkatkan motivasi dan hasil belajar IPA. Selain itu, penelitian ini mendukung implementasi Kurikulum Merdeka dalam mewujudkan lingkungan belajar inklusif bagi keberagaman peserta didik serta dapat menjadi rujukan bagi guru dalam menerapkan strategi pembelajaran adaptif dengan pendekatan CRT untuk menghadapi tantangan lingkungan pembelajaran yang dinamis.

Kata Kunci: Culturally Responsive Teaching (CRT), hasil belajar, dan motivasi belajar.

INTRODUCTION

Education is a fundamental foundation that plays a role in supporting national progress. Education is a fundamental foundation that plays a role in supporting national progress. According to Ki Hajar Dewantara, the essence of education is an effort to guide all the natural forces that exist in children as individuals and members of society so that they can achieve happiness (Sugiarta et al., 2019; Sukri et al., 2016). Education can also be interpreted as the main key to increasing knowledge and developing various student abilities through the learning process (Gulo, 2022). Therefore, education can be defined as an effort to guide an individual in improving knowledge and skills through the learning process. Education and the learning process go hand in hand to help individuals reach their full potential and excel in various fields. One indicator of educational success is student learning outcomes.

Learning outcomes represent student achievement after participating in learning activities (Adi Nugraha et al., 2020). Learning outcomes serve as a benchmark for the success of the learning process and serve as a basis for teachers to make improvements in subsequent learning processes (Nabillah & Abadi, 2019). Learning outcomes are defined as a reflection of basic abilities to determine students' level of understanding and mastery of subject matter (Darmawan Harefa, 2020). Based on several opinions on learning outcomes outlined, it can be concluded that the definition of

learning outcomes is a measure of students' achievement of learning objectives. This measure is oriented towards the level of understanding and mastery of the material obtained after participating in the learning process. Optimal learning outcomes can be created through synergy between teachers and students in achieving learning objectives (Aini & Hadi, 2023). Improvement in learning outcomes can be influenced by several factors, namely internal and external factors. One internal factor that significantly influences learning outcomes is learning motivation. Learning motivation is an internal drive that drives individuals to do various things in order to achieve the goals of the learning process (“IMPLEMENTASI PEMBELAJARAN BERDIFERENSIASI DALAM MENINGKATKAN MOTIVASI BELAJAR PESERTA DIDIK KELAS 8 DI SMPN 2 KALISAT,” 2023).

Based on preliminary research at SMPN 3 Jember through interviews with science teachers and direct observation, it was found that class VIIIA students have low levels of science learning motivation. This low learning motivation also impacts their learning outcomes. Other factors suspected to be the cause are a lack of student involvement in the learning process, a lack of innovative learning approaches, and students' difficulties in understanding abstract science material. Another fact found through direct observation is that low learning motivation can be identified from students' actions such as doodling in books, drawing, chatting with classmates, being confused when asked questions, and daydreaming during the learning process. These conditions have the potential to influence low student learning outcomes. Improving these learning outcomes requires teacher creativity to create engaging and enjoyable learning for students (Fitria et al., 2023). Therefore, improvement efforts are needed through the implementation of appropriate learning approach strategies to increase student motivation and learning outcomes.

Science learning is essentially a combination of theory and application to phenomena that occur in society (Amir et al., 2023). Integrating science learning with cultural concepts and local wisdom will provide meaningful learning experiences for students. This aligns with Vygotsky's Social Constructivism theory, which states that children's cognitive development cannot be separated from their social and cultural context. Regarding this, (Nasution et al., 2023) explains that the learning process should begin by linking students' prior knowledge and integrating it with their cultural backgrounds and perspectives. This principle reflects Ki Hajar Dewantara's philosophy regarding the importance of harmonizing cultural elements in education to shape whole people. The implementation of this idea aligns with the direction of the Independent Curriculum, which emphasizes the importance of culturally responsive learning through the Culturally Responsive Teaching (CRT) approach. The diversity of student backgrounds demands the creation of an inclusive, effective, and equitable learning environment. Bahari et al., (2025) explains that teachers need to be responsive by implementing adaptive learning strategies, such as Culturally Responsive Teaching (CRT), to adapt learning to the diverse characteristics of students. Therefore, teachers need to develop more innovative learning approaches to meet today's learning needs.

The Culturally Responsive Teaching (CRT) approach focuses on recognizing, respecting, and responding to the diversity of cultures, backgrounds, and experiences of students in the learning process (Sari et al., 2023). The relevance of this approach is reinforced by various previous studies that demonstrate its influence on improving student learning outcomes and motivation. Fitria et al. (2023) in their research showed that the CRT approach contributed to improving student learning outcomes. Furthermore, implementing the CRT approach proved that significantly improved student learning outcomes and motivation (Assyifa & Nasikhah, 2024). Similar findings were also reported by Amir et al. (2023), who stated that implementing learning strategies with the CRT approach was effective in increasing student learning motivation.

The low learning outcomes of science students on the properties of light are often influenced by the use of conventional learning approaches that tend to be theoretical and pay little attention to the diversity of student backgrounds. In fact, light phenomena are closely related to students' daily lives and local cultures, such as the concepts of shadows and reflection in Wayang Kulit performances (Larasati et al., 2023). One pedagogical approach that has developed to address this challenge is the Culturally Responsive Teaching (CRT) approach. Based on this background, this study was designed as Classroom Action Research by integrating cultural elements into science subjects on the concept of

light through the Culturally Responsive Teaching (CRT) approach. The implementation of this approach was carried out by adapting the festival culture.lanterns held as part of the Dieng Culture Festival (DCF).This research was conducted on students in class VIII-A of SMP Negeri 3 Jember. The main objective of the researcher was to address science learning issues, particularly those related to low learning outcomes and student motivation.

METHOD

The type of research conducted was Classroom Action Research (CAR) to improve student motivation and learning outcomes. The subjects of this study were 33 students in class VIII-A at SMP Negeri 3 Jember, consisting of 16 males and 17 females. This Classroom Action Research was carried out over two cycles, each consisting of several stages: planning (plan), implementation (act), observation (observation), and reflection (reflection). Data collection techniques used were tests, observation, and documentation. The research instrument used a test sheet containing a pretest, posttest, and observation sheet. Content validity was carried out through expert judgment by one lecturer specializing in Physics education, one lecturer specializing in Science education, and one Science tutor teacher at SMP Negeri 3 Jember. Instrument validity testing was conducted to ensure that the cognitive test sheet and observation sheet used could accurately measure students' level of understanding of the material on light and their learning motivation. Aspects validated included the suitability of cultural content to the Science material in the Independent Curriculum, item construction, and language readability. Based on the validation results, the instrument was declared 'Suitable for Use with Minor Revisions'. The data obtained were of two types, namely qualitative and quantitative. Qualitative data were obtained based on data collection techniques in the form of observations with observation sheets as guidance to observe student behavior and interactions during the learning process. The data were then analyzed descriptively qualitatively. Meanwhile, quantitative data were obtained through testing activities using instruments in the form of pretests and posttests. Assessment of student learning outcomes was carried out by determining a maximum score of 100 with a Minimum Completion Criteria (KKM) value set at 75. Furthermore, the number of students who achieved completion and not achieved completion was calculated in percentage form using the following formula:

$$\text{Learning Completion} = \frac{\text{score obtained}}{\text{Maximum score}} \times 100\%$$

The average value is obtained by adding up the values of all students divided by the total number of students.

FINDINGS AND DISCUSSION

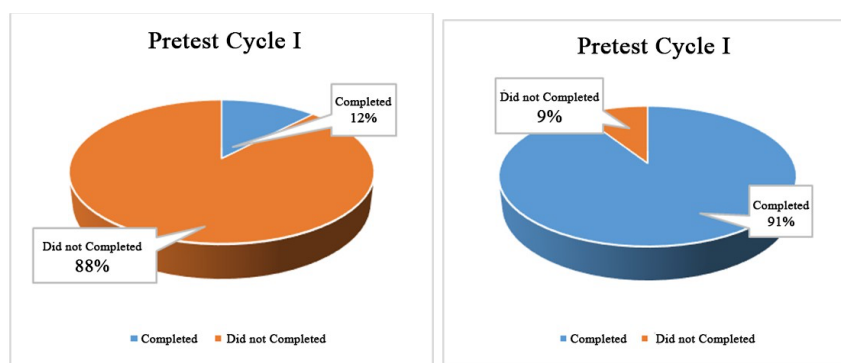
Findings

This classroom action research was conducted in two cycles, namely cycle I and cycle II. The differences between cycle I and cycle II lie in the indicators and learning objectives. Meanwhile, the learning model and approach remain the same, namely using the inquiry learning model with the Culturally Responsive Teaching (CRT) approach. Based on the research results, there was a significant transformation and improvement in learning outcomes and student completion. In each cycle, pretest 1 and pretest 2 were held. Similarly, at the end of each cycle, students were given posttest 1 and posttest 2 which were carried out after being given actions in the learning process. During the learning process in cycles I and II, researchers made observations and recorded several

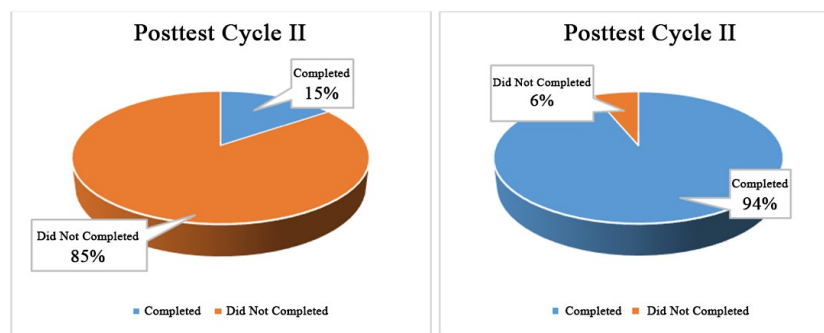
findings during the learning process. A summary of the evaluation results, including the pretest and posttest, is presented to provide an overview of student learning outcomes. The following is the result of the analysis of student learning based on the research that has been conducted.

Tabel 1. Analysis of learning outcome data from cycle I and cycle II

No	Aspect	Cycle I		Cycle II	
		Pretest	Posttest	Pretest	Posttest
1.	Number of students who took the test	33 people	33 people	33 people	33 people
2.	Number of students who completed	4 people (12.12%)	30 people (90.91%)	5 people (15.15%)	31 people (93.94%)
3.	Number of students who did not complete	29 people (87.88%)	3 people (9.09%)	28 people (84.85%)	2 people (6.06%)
4.	Total value	1945	2820	1860	2950
5.	The highest score	80	100	100	100
6.	Lowest value	20	70	10	60
7.	Average value	58.94	85.45	56.36	89.39



Picture 1. Pre-test and post-test diagram of cycle I



Picture 2. Pre-test and post-test diagram of cycle II

Pretest data in cycle I and cycle II showed that most of the students in class VII-A had not yet mastered the basic concepts of light material independently. In cycle I, as many as 87.88% (29 people) of students were in the incomplete category with a fairly low class average score of 58.94. A similar condition was seen in cycle II, where the initial incomplete level still dominated at 84.85% (28 people) with an average score of 56.36. The low pretest achievement in both cycles indicates that light material has characteristics that tend to be abstract so that students have difficulty in understanding the concept before receiving contextual learning intervention.

After being given an inquiry learning action that integrates cultural values and local wisdom through the CRT approach, there was an increase in cognitive understanding in students. The number of students who achieved the completion criteria increased from 4 people (12.12%) in the pretest to 30 people (90.91%) in the posttest. This increase was also in line with the increase in the average class score which reached 85.45 with the highest score touching the perfect number. The results of observations during the first cycle showed that the active involvement of students increased when the light phenomenon was linked to culture. However, there were still 3 people (9.09%) students who had not achieved completion due to obstacles in adapting to the independent inquiry model.

Reflections from Cycle I, which were then optimized in Cycle II through indicator adjustments and sharpening of learning objectives, successfully brought student learning outcomes to an optimal level. In the Cycle II posttest, the classical mastery level increased to 93.94% (31 students). Only two students had not achieved individual mastery. Overall, student mastery of the material also showed significant improvement. This was evidenced by the increase in the class average score to 89.39 and the lowest score from 20 at the beginning of Cycle I to 60 at the end of Cycle II.

Overall, the research data proves that the integration of the Culturally Responsive Teaching (CRT) approach into the inquiry model is able to facilitate students' learning needs. This approach helps students understand the concept of light, which was previously considered abstract and difficult to understand, as indicated by the low pretest achievement, into a more concrete concept that can be constructed independently by students. The impact of the implementation of this approach is shown through an increase in classical completeness that consistently exceeds the minimum completeness standard target, which is above 85%.

Discussion

The actions carried out in the pre-cycle stage were to conduct observations to obtain data on student learning motivation in class VIII-A through teaching assistance activities. The information obtained was strengthened through intensive interviews with science teachers to elaborate on the observation results. Through these interviews, the science teachers explained various obstacles and

challenges faced during the learning process in class VIII-A of SMP Negeri 3 Jember. Next, the researcher prepared a learning plan that included the preparation of learning tools with an inquiry model using the Culturally Responsive Teaching (CRT) approach, the preparation of LPKD, the preparation of pretest and posttest instruments, and the preparation of material on the concept of light related to the culture and traditions of the community, namely the lantern festival held as part of the Dieng Culture Festival (DCF) series. This tradition was chosen because it is related to the concept of light and contains cultural values that can be used as a learning context. The lantern festival is a symbol of hope, prayer, and an expression of gratitude for the Dieng community for the various blessings received.

The material "Light and Its Properties" and "Shadow Formation in Mirrors" is often seen as abstract material because students are required to visualize the path of light geometrically. The low understanding of students in previous learning is thought to be influenced by the learning approach that tends to be theoretical and does not provide a context close to the students' experiences, as shown by the low average pretest scores in both cycles, namely 58.94 and 56.36. The application of the Culturally Responsive Teaching (CRT) approach integrated with the inquiry learning model showed an increase in student learning outcomes as shown by an increase in the average posttest score in Cycle I of 85.45 and Cycle II of 89.39. In Cycle II, students began to show an understanding that science learning is not only theoretical, but also has connections with phenomena in everyday life so that it is easier to understand and apply. In addition, active participation of students in learning also increased when they interacted and collaborated with group members. Pedagogically, these results indicate that the CRT approach can act as cognitive scaffolding that helps students connect prior knowledge with new concepts being learned.

The implementation of the learning plan began with a pretest before carrying out learning in cycle I. Based on the results of the pretest data analysis, the number of students who had not achieved completeness was more dominant than the students who had completed it, with a ratio of 29:4. This indicates that most students had not achieved the Minimum Completion Criteria (KKM). At this stage, the researcher acted as a model teacher in class VIII-A. Furthermore, learning was carried out in accordance with the syntax of the inquiry learning model. The initial stage was providing problem orientation in the form of cultural phenomena associated with the concept of light. At this stage, the implementation of the Culturally Responsive Teaching (CRT) approach began to be applied. Students were directed to recognize, understand, and identify cultural elements through video displays, then connect them with the concept of light. In addition, students were also given stimuli through similar cultural examples originating from the Jember area to strengthen the learning contextualization process. The concept of light was not only explained theoretically, but also linked to cultural phenomena and their application in everyday life. When the concept of light is linked to the Dieng Lantern Festival in Cycle I and the Contemporary Dance "Cermin" in Cycle II, students are encouraged to construct knowledge based on cultural phenomena stored in their long-term memory. Students explore their existing cultural experiences, making the learning process more meaningful. This is in line with Ausubel's Meaningful Learning theory, which emphasizes the importance of linking new information to students' existing knowledge structures. When students are able to connect the Dieng Lantern Festival to traditions closer to their experience, such as the takbiran night of Eid al-Fitr, Chinese New Year, or Vesak, the process of assimilating new knowledge into existing cognitive structures occurs. This finding is also in line with Vygotsky's Social Constructivism theory, which states that students' cognitive development is influenced by the surrounding social and cultural context.

Psychologically, the improvement of students' learning outcomes is closely related to the increase in intrinsic motivation and the restoration of students' academic self-efficacy. In Cycle I, although the learning completion rate had reached 90.91%, observations showed that there were still psychological barriers in the form of social anxiety, which was indicated by students' shyness and lack of self-confidence when presenting the results of their LKPD analysis. Therefore, in Cycle II, improvements were made by providing opportunities for students to determine their own study groups as a form of learning intervention that supports students' psychological comfort. Observations in Cycle II showed an increase in students' enthusiasm, courage in discussions, and

self-confidence when making presentations. These conditions are thought to contribute to the increase in classical completion which reached 93.94%.

At the final stage of learning, the teacher administered a posttest to measure the achievement of students' learning objectives. The evaluation results in Cycle I showed that the percentage of learning completion reached 90.91%, while the percentage of students who had not completed the learning was 9.09%. When compared to the pretest results, there was a significant increase in learning outcomes. This was indicated by an increase in the average score from 58.94 in the pretest to 85.45 in the posttest after implementing the Culturally Responsive Teaching (CRT) approach.

Based on the observation results, students' learning motivation showed an increase in cycle II. This increase was evident in the students' enthusiasm in answering teacher questions, identifying material concepts related to culture, discussing in groups, and making presentations in front of the class, which were better than in the previous lesson. This condition indicated that students had a higher enthusiasm for learning and readiness to be actively involved in the learning process. At the final stage of learning in cycle II, the teacher gave a posttest to measure the achievement of learning objectives. The evaluation results showed that the percentage of learning completion reached 93.94%, while the percentage of students who had not achieved completion was 6.06%. When compared to the pretest results, there was a significant increase in learning outcomes. This evidence was supported by an increase in the final average score of students to 56.36 in the pretest and 89.39 in the posttest after the implementation of learning using the Culturally Responsive Teaching (CRT) approach.

The successful implementation of this learning model demonstrates that the Culturally Responsive Teaching (CRT) approach not only integrates cultural elements into learning but also helps students develop a more meaningful understanding of science concepts. Through the cultural context, students are able to connect science concepts to their experiences and the environment around them. This finding aligns with research by (Sari et al., 2023) and Assyifa et al. (2024), which demonstrated that the CRT approach can improve student motivation and learning outcomes. Furthermore, this research also supports the implementation of the Independent Curriculum (Kurikulum Merdeka) in realizing inclusive and responsive learning to student diversity.

CONCLUSION

Based on the research results, it can be concluded that science learning uses a problem-solving approach. Culturally Responsive Teaching (CRT) effectively improve student motivation and learning outcomes. Student learning outcomes showed an increase from an average posttest score of 85.45 in cycle I to 89.39 in cycle II. Student learning mastery also experienced a significant increase. Student learning mastery results also experienced an increase from a posttest score of 90.91% in cycle I to 93.94% in cycle II. In addition, student learning motivation also showed a positive increase marked by active involvement in the learning process. The integration of cultural elements such as the Dieng Lantern Festival and the Mirror Dance helped students understand science concepts in a more contextual and meaningful way. This study still has limitations in the selection of cultural contexts that are not entirely derived from the local cultural background of students in Jember. Therefore, further research is recommended to further explore Jember's local wisdom, such as the Jember Fashion Carnaval (JFC) or other local traditions in order to build a stronger emotional connection between students in the learning process. It is hoped that the results of this research can be a reference for educators in developing learning that is more innovative, contextual, and responsive to the diversity of students.

REFERENCES

- Adi Nugraha, S., Sudiatmi, T., & Suswandari, M. (2020). Studi Pengaruh Daring Learning Terhadap Hasil Belajar Matematika Kelas IV. *Journal of Research Innovation*, 1(3), 265–276.
- Aini, A., & Hadi, A. (2023). Peran Guru Dalam Pengelolaan Kelas Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Guru Madrasah Ibtidaiyah Al-Amin*, 2(2), 208–224. <https://doi.org/10.54723/ejpgmi.v2i2.104>

- Amir, SD; Samputri, S; Rasyid, A; Suryani, S. (2023). Meningkatkan Motivasi Belajar Peserta Didik Terhadap Pembelajaran IPA dengan Pendekatan Culturally Responsive Teaching SMP Negeri 1 Malili. *Jurnal Pemikiran Dan Pengembangan Pembelajaran*, 5(2), 377–382.
- Assyifa, M. Z., & Nasikhah, U. (2024). Upaya Peningkatan Hasil Belajar Dan Motivasi Siswa Melalui Pendekatan Culturally Responsive Teaching (CRT) Berbasis Etnosains. *PANDU : Jurnal Pendidikan Anak Dan Pendidikan Umum*, 2(4), 31–41. <https://doi.org/10.59966/pandu.v2i4.1372>
- Bahari, P. K., Dewi, R. S. I., & Ekawati, R. (2025). Optimalisasi Pendekatan Culturally Responsive Teaching (CRT) dalam Pembelajaran Abad 21. *DLAJAR: Jurnal Pendidikan Dan Pembelajaran*, 4(1), 52–60. <https://doi.org/10.54259/diajar.v4i1.3901>
- Darmawan Harefa, D. (2020). Peningkatan Hasil Belajar Ipa Fisika Siswa Pada Model Pembelajaran Prediction Guide. *Indonesian Journal of Education and Learning*, 4(1), 399. <https://doi.org/10.31002/ijel.v4i1.2507>
- Fitria, F., Saenab, S., Tahir, S., & Djumriah, D. (2023). Peningkatan Hasil Belajar IPA Peserta Didik Menggunakan Pendekatan Culturaly Responsive Teaching di SMP Negeri 1 Pallanga. *Jurnal Pemikiran Dan Pengembangan Pembelajaran*, 5(2), 1004–1008.
- Gulo, A. (2022). Pengaruh Model Problem Based Learning (Pbl) Berbasis Peta Konsep Terhadap Hasil Belajar Siswa. *Educativo: Jurnal Pendidikan*, 1(1), 334–341.
- IMPLEMENTASI PEMBELAJARAN BERDIFERENSIASI DALAM MENINGKATKAN MOTIVASI BELAJAR PESERTA DIDIK KELAS 8 DI SMPN 2 KALISAT. (2023). *Program Studi Pendidikan IPA FKIP Universitas Jember, Vol 6 No.*
- Larasati, A., Sunarti, T., & Budiwati, B. (2023). Implementasi Pendekatan Culturally Responsive teaching (CRT) Pada Pembelajaran Fisika Untuk Meningkatkan Motivasi Belajar Peserta Didik. *Inovasi Pendidikan Fisika*, 12(3), 83–91.
- Nabillah, T., & Abadi, A. P. (2019). Faktor Penyebab Rendahnya Hasil Belajar Siswa. *Sesiomadika: Prosiding Seminar Nasional Matematika Dan Pendidikan Matematika*, 2(1), 659–663. <http://journal.unsika.ac.id/index.php/sesiomadika>
- Nasution, D. N., Efendi, U. R., & Yunita, S. (2023). Implementasi Pendekatan Pembelajaran Culturally Responsive Teaching Pada Mata Pelajaran PPKN Kelas V Sekolah Dasar. *Jurnal Sekolah PGDS FIP UNIMED*, 8(1), 171–177.
- Sari, A., Sari, Y. A., & Namira, D. (2023). PENERAPAN MODEL PEMBELAJARAN PROBLEM BASED LEARNING TERINTEGRASI CULTURALLY RESPONSIVE TEACHING (CRT) UNTUK MENINGKATKAN MOTIVASI DAN HASIL BELAJAR SISWA KELAS X IPA 2 SMA NEGERI 7 MATARAM PADA MATA PELAJARAN KIMIA TAHUN AJARAN 2022/2023. *Jurnal Asimilasi Pendidikan*, 1(2), 110–118. <https://doi.org/http://asimilasi.journalilmiah.org>
- Sugiarta, I. M., Mardana, I. B. P., Adiarta, A., & Artanayasa, W. (2019). *Jurnal Filsafat Indonesia*. *Jurnal Filsafat Indonesia*, 2(3), 124–136.
- Sukri, S., Handayani, T., & Tinus, A. (2016). Analisis Konsep Pemikiran Ki Hajar Dewantara Dalam Perspektif Pendidikan Karakter. *Jurnal Civic Hukum*, 1(1), 33. <https://doi.org/10.22219/jch.v1i1.10460>