



## Efforts to Improve Class V IPS Learning Outcomes Through the Implementation of the Problem Based Learning Method at State Elementary School

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### ABSTRACT

**Research Objective:** To improve students' learning outcomes in social studies. By implementing the Problem Based Learning (PBL) method to help students understand social studies concepts better.

**Methodology:** This research is a Classroom Action Research (CAR) consisting of four stages of activities, namely: (1) planning stage, (2) action implementation stage, (3) observation stage, and (4) evaluation stage and reflection. The research sample was fifth grade students at SDN 143 Tamiai, with research instruments namely observation, documentation and tests.

**Main Findings:** The results of the study showed that in the pre-cycle, students' learning completeness reached 27.58%. There was an increase of 20.69% in the implementation of cycle I. In cycle II, there was an increase of 37.93% or learning completeness of 86.20%. Thus, it is proven that the use of the Problem Based Learning learning model can improve students' learning outcomes.

**Research Update:** This research strengthens the relationship between the Problem Based Learning model and learning outcomes, especially in social studies lessons.

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## 1. INTRODUCTION

Social Studies (IPS) is one of the subjects in Elementary School. IPS is related to events that occur in the social environment. Social learning is very important because it can foster critical and objective thinking in students and is conducive to fostering students' social spirit. In addition, elementary school IPS learning also instills noble attitudes such as caring for the surrounding environment and being responsible for the sustainability of nature [1], [2]. Through these activities, IPS learning develops social attitudes and process skills [3], [4]. Therefore, IPS learning in elementary schools should occur by providing direct experience, interesting learning, and increasing student involvement.

IPS education at the elementary level is important to be provided in order to understand the lives of society and the environment through learning media such as print media, electronic media, social media, and even directly through daily life experiences in the community. As with IPS education learning, it prioritizes the "educational"

aspect rather than "conceptual transfer" because by studying IPS education, students are expected to acquire attitudes about everyday life. In accordance with the objectives of the IPS subject, namely to form citizens who are able to socialize well and have self-confidence in their lives amidst social and material forces, so that they can become responsible citizens [5].

However, the learning situation in schools is actually different from what is expected. The learning process only listens, does assignments, and only focuses on books, so that learning in the classroom is very passive [6], [7]. In addition, teachers need to motivate students to be more active, creative and innovative towards various problems in their environment [8], [9]. Teachers must also be able to provide solutions to problems based on their own knowledge and understanding. If this problem is left unchecked, it will have a negative impact on the learning process in schools. Learning at SD Negeri 143 Tamiai is still far from expectations.

Based on observations in IPS learning, there are still students who are embarrassed to ask and answer questions asked by the teacher. This is because students are afraid to give the wrong answers or opinions. The learning that occurs does not use an innovative learning model and is less than optimal in terms of the use of learning media that motivate students to learn. Therefore, the enthusiasm and initiative of students to participate in learning are low. This results in low social studies learning outcomes.

Several previous studies have also revealed this fact, showing that social studies learning is still dominated by teachers using the lecture method [10]. Such social studies learning results in the role of students in learning being very small because students can only listen to the teacher's explanation and are not given the freedom to explore their own knowledge [11]. If this problem is allowed to continue, it will have an impact on the failure to achieve learning objectives and lead to a decline in the quality of graduates.

The right solution to overcome the problems that arise is to apply an innovative learning model that is expected to improve creative thinking skills and make students more motivated to learn. A suitable alternative for this purpose is to use the Problem Based Learning model. The selection of a learning model is an important component in improving student learning outcomes [12], [13]. Implementing an inappropriate learning model can result in boring learning for students. Therefore, teachers must develop strategies to create effective, efficient and appropriate learning. Every material load in schools needs to apply the problem based learning model [14], [15].

Various previous research findings show that Problem Based Learning is a learning model that uses unstructured and open real-world problems as a context to allow students to develop problem-solving and critical thinking skills while building new knowledge [16], [17]. The problem based learning model can improve students' critical thinking skills [18], [19]. The Problem Based Learning model can also improve students' learning outcomes [20], [21]. The Problem Based Learning model was chosen because it requires students to actively participate in the process of investigation and problem solving during learning.

## 2. RESEARCH METHODS

The research conducted is a type of classroom action research (CAR). Classroom action research, commonly abbreviated as CAR, is action research conducted by a teacher with the aim of improving the quality of learning practices in his/her class [22], [23]. The main characteristic of classroom action research is participation and collaboration between researchers and members of the target group. Classroom action research must show improvements and positive changes towards improvement.

If the action causes weaknesses, setbacks, or negative changes, it means that the action is contrary to the nature of classroom action research. The subjects in this study were fifth grade students of public elementary school 143 Tamiai. The number of subjects in this study was 29 students, with 12 male students and 17 female students. The object of this classroom action research was the learning outcomes of students with the application of the Problem Based Learning learning model. This Classroom Action Research was conducted in two cycles. Each PTK cycle consists of four stages of activity, namely: (1) planning stage, (2) action implementation stage, (3) observation stage, and (4) evaluation and reflection stage [24], [25].

The data collection techniques used in this study were observation, documentation and tests. The types of research data include qualitative data and quantitative data. Qualitative data were obtained through observation using observation sheets, while quantitative data were obtained through tests at the end of each action cycle. Data analysis used in this study is divided into two types, namely qualitative analysis and quantitative analysis. Qualitative data will be analyzed descriptively qualitatively based on the observations made [26]. While quantitative descriptive analysis is carried out on quantitative data based on test results at the end of each Action cycle [27].

The indicator of research success can be seen from the progress of learning outcomes achieved by students in accordance with the KKM set by SD Negeri 143 Tamiai, namely obtaining an individual score of at least 75. The indicator of success desired by the researcher in this study is that the average learning outcomes of students classically reach 75 and the classical learning completeness achieved is 75%.

### 3. RESULTS AND DISCUSSION

#### 3.1 Research result

The research began with observation, documentation and testing activities based on classroom learning. This aims to find out the problems that occur in the learning process. In the initial stage, the researcher conducted learning in class V, then gave a test in the form of evaluation questions to determine the students' understanding. The results obtained by class V students of public elementary school 143 Tamiai averaged 41.89 with the number of students reaching KKM of 8 students or 27.58%. Referring to the KKM (Minimum Completion Criteria) value at the beginning of the study, it can be seen in table 1 below:

Table 1. Percentage of Completion of Student Learning Outcomes Pre-Cycle

No.	Nilai	Before Action		Description
		Number of Students	Presentase %	
1	≥	8	27,58%	Completed
2	≤	21	72,41%	Not Completed
	Total	29	100%	
	Highest Score		100	
	Lowest Score		10	
	Average		41,89	

Based on the table above, the pre-cycle stage shows that 21 students in social studies learning have not achieved the expected results. Therefore, corrective actions were taken using the Problem Based Learning model which was carried out in 2 cycles. The implementation of actions in cycle 1 and cycle 2 using the Problem Based Learning model in social studies subjects was carried out in one meeting each cycle.

The stages of implementing learning with the Problem Based Learning model include planning, implementation, observation, evaluation and reflection. The planning stage is carried out by designing learning tools that contain the arrangement of activities in accordance with the steps for implementing the Problem Based Learning model, namely problem orientation, organizing students to learn, guiding individual and group investigations, developing and presenting work results, analyzing and evaluating the problem-solving process.

The implementation of learning that has been carried out is good, educators have carried out learning in accordance with the design of learning tools and the steps taken are sequential based on the Problem Based Learning model applied to learning. Problem based learning focuses on solving problems related to everyday real life. The implementation of the problem based learning model increases student activity and participation. This is because a series of activities are directed at forming groups to discuss and collaborate, so that learning does not focus on educators but students actively seek various sources of information to collect data needed in solving problems.

The results of observations and learning observation activities show that at the beginning of learning, students are still confused about the steps of the activities carried out, so that students ask a lot about the implementation of learning, besides that the atmosphere is not yet conducive because some students are less focused and do not carry out discussions, then from these problems the researcher and the class teacher make improvements by providing guidance, so that these problems can be resolved and the learning process shows success with activities that make students actively participate.

Reflection activities aim to determine the level of success and find solutions to problems that arise during learning activities with the application of the Problem Based Learning model. The results of the analysis and reflection activities will determine actions to overcome problems in learning activities. If the results are not satisfactory, then further corrective actions are taken by improving previous corrective actions.

To find out the research results obtained from learning outcomes through the application of the Problem Based Learning learning model, based on learning completeness, average, minimum and maximum values of class V students of public elementary school 143 Tamiai, in detail are presented in the following table 2:

Table 2. Comparison of Student Learning Outcomes Based on Learning Completeness, Average, Minimum and Maximum Values Pre-Cycle, Cycle I, and Cycle II

No.	Value	Pre Cycle		Cycle I		Cycle II	
		Number of Students	Presentase	Number of Students	Presentase	Number of Students	Presentase
1	Completed	8	27,58%	14	48,27%	25	86,20%
2	Not Completed	21	72,41%	15	51,72%	4	13,79%

Total	29	100%	29	100%	29	100%
Highest Score	100		100		100	
Lowest Score	10		10		50	
Average	41,89		58,89		84,48	

Based on table 2, there is a comparison of the increase in learning outcomes of grade V students of public elementary school 143 Tamiai in pre-cycle activities, cycle I and cycle II. In the pre-cycle, the average score of students was 41.89, while the average score of students in cycle I was 58.89, and the average score of students in cycle II reached 84.48. In the pre-cycle, the completion score only reached 27.58% or from the total number of 29 students, only 8 students achieved the KKM, 21 students did not complete and had not achieved the KKM determined with a percentage of 72.41%.

The percentage of completion in the pre-cycle is included in the poor category. In cycle I, the completion score reached 48.27% or from the total number of 29 students, there were 14 students who achieved the KKM, 15 students did not complete and had not achieved the KKM with a percentage of 51.72%. The percentage of completion of cycle I is categorized as quite good but not optimal, because there are students who get scores below the KKM. In cycle II, the completion value reached 86.20% or from the total number of 29 students, 25 students achieved the KKM. 4 students did not complete and had not achieved the KKM with a percentage of 13.79%. The percentage of completion of cycle II is categorized as very good. The learning outcomes of students in cycle II experienced a satisfactory increase in achieving completion and showed the success of improving learning outcomes in social studies subjects with the application of the Problem Based Learning model, so that researchers did not continue to improve learning.

Based on the results of the study, an increase was obtained in the pre-cycle, cycle I, and cycle II. In the pre-cycle, the students' learning completion reached 27.58% or there were 8 students who achieved learning completion out of 29 students, in cycle I, the students' learning completion reached 48.27% or there were 14 students who completed their learning, while in cycle II, the students' learning completion reached 86.20% or there were 25 students who had completed their learning. The increase in the number of students who completed the pre-cycle to cycle I from 8 students increased to 14 students who completed it, in cycle I to cycle II from 14 students increased to 25 students who completed it after the implementation of the Problem Based Learning model in the learning process. The percentage of students' completion in cycle II has reached the success indicator in the study. So the researcher did not continue to improve learning. In cycle I, the implementation of learning through the implementation of Problem Based Learning showed an increase, this can be seen from the percentage of completion with the number of students reaching the KKM, namely 14 students. The percentage of learning completion increased from pre-cycle to cycle I reaching 20.69% but the increase has not met the expected success criteria of 75% [25].

The results of cycle I were only 48.27% of students who achieved the completion criteria. While 51.72 students have not achieved the expected completion criteria. The increase in cycle I was obtained due to changes in learning conditions from passive to active in accordance with the steps for implementing the Problem Based Learning model. In cycle II, the implementation of learning taught the material. Through the implementation of Problem Based Learning, there was an increase, this can be seen from the percentage of completion with the number of students who achieved the KKM, namely 25 students. The percentage of learning completion increased from cycle I to cycle II reaching 37.93%. The results of student learning completion in cycle II were 86.20%. While students who had not met the success criteria for completion were 13.79%. This increase has met the success criteria for an increase above 75%. The improvement in cycle II was obtained because the implementation of learning applied the steps of the Problem Based Learning model, namely problem orientation, organizing students to learn, guiding individual and group investigations, developing and presenting work results, analyzing and evaluating the problem-solving process. The learning process was carried out by providing guidance and appreciation as an improvement on the shortcomings of cycle I learning, so that the problem could be resolved and the learning process showed maximum success in the implementation of the PBL model with activities that made students actively participate and manage learning in a conducive, effective and efficient manner.

The improvement of social studies learning outcomes of grade V students shows that by implementing the Problem Based Learning model, students can solve problems according to the learning material, and student activity also increases. This is in line with social studies learning, namely the problem-solving method is the main method that can encourage students to solve problems because students are directly involved in solving problems [28], [29]. This shows that the application of the Problem Based Learning learning model in social studies learning, students are directly involved in solving problems and have an impact on improving student learning outcomes.

This finding is reinforced by the findings of previous studies which state that learning with the application of the Problem Based Learning model can improve students' social studies learning outcomes [28]. There is an increase in motivation and social studies learning outcomes of grade IV students using the problem based learning learning model [14], [30]. The application of the Problem Based Learning learning model assisted by still image media can improve students' learning outcomes comprehensively, including the cognitive, psychomotor, and

affective domains [32]. This study is related to the application of the Problem Based Learning model, namely, students play an active role in learning because they are faced with real (authentic) problems, meaningful learning, independent learning, and student-centered learning.

This study provides a new contribution by showing the effectiveness of the application of the Problem Based Learning (PBL) learning model in improving the social studies learning outcomes of grade V students at SDN 143/III Tamiai. The focus of the study lies in how this method not only improves learning outcomes cognitively, but also in the psychomotor and affective domains, which create a holistic learning experience. This study also underlines the importance of active student involvement in authentic problem solving, which is one of the key elements in meaningful learning [33]. This approach offers a new perspective on the application of PBL that is associated with the context of learning in elementary schools that requires adaptation to the specific needs of students.

However, this study has several limitations. First, the study was only conducted at one elementary school, namely SDN 143/III Tamiai, so generalizing the research results to a broader context requires caution. Second, this study has not fully explained the variation in the effectiveness of the PBL model for students with different initial abilities. In addition, the limited time of the study also became an obstacle in evaluating the long-term impact of the PBL method on the development of student learning. The lack of analysis of external factors, such as parental support and the availability of learning resources, is also an aspect that needs to be considered in further research. The implementation of this study can be done by designing PBL-based social studies learning activities that involve authentic problems and are relevant to students' daily lives.

Teachers can utilize supporting media such as still images and technology to facilitate the learning process. Learning activities must be designed to encourage students to think critically, work together in groups, and practice independent learning [34]. Furthermore, training for teachers on the application of PBL in various social studies materials can be provided, so that the application of this method can be expanded in various contexts. The results of this study can also be used as a reference by policy makers in supporting the implementation of the PBL model at the elementary school level.

#### 4. CONCLUSION

This classroom action research was conducted in three cycles consisting of pre-cycle, cycle I, cycle II in one cycle one learning was carried out. Based on the results of the study, it can be concluded that the implementation of Problem Based Learning can improve the learning outcomes of grade 5 students of public elementary school 143 Tamiai with material on theme 1 (Animal and Human Movement Organs) sub-theme 1 (Animal Movement Organs) and sub-theme 2 (Humans and the Environment). This is indicated by an increase in the average value and an increase in student learning completeness from the results of the pre-cycle, cycle I, cycle II. The data obtained in the pre-cycle were an average value of 41.89, the average value of cycle I was 58.89, the average value of cycle II was 84.48. In the pre-cycle, the percentage of KKM completion was 27.58% with a less good category, the percentage of completion in cycle I was 48.27% with a sufficient category, and the percentage of students who achieved KKM in cycle II was 86.20% with a very good category.

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#### REFERENCES

- [1] R. Khairah, "Penggunaan media maket terhadap keaktifan belajar sejarah materi masa kehidupan pra-aksara siswa," *j. soc. knowl. educ.*, vol. 1, no. 4, pp. 104–110, 2020, doi: 10.37251/jske.v1i4.369.
- [2] I. Y. Rachmawati, H. Van Thang, and M. M. Zwick, "Comparison of cooperative listening team and numbered head together types of learning outcomes of geography in the material of earth's rotation and revolution," *j. soc. knowl. educ.*, vol. 4, no. 3, pp. 111–121, 2023, doi: 10.37251/jske.v4i3.702.
- [3] M. C. Ambarwati and R. Widodo, "Peningkatan kolaborasi peserta didik melalui model pembelajaran problem-based learning," *j. pendidik. profesi guru*, vol. 4, no. 1, pp. 9–16, 2023, doi: 10.22219/jppg.v4i1.25484.
- [4] J. R. Park and T. H. Kim, "Effect of box height on the muscle activity during the bulgarian split squat exercise," *int. j. hum. mov. sport. sci.*, vol. 11, no. 1, pp. 118–123, 2023, doi: 10.13189/saj.2023.110114.
- [5] S. Misbah, "Penerapan metode umpan balik (feed back partner) untuk meningkatkan prestasi belajar siswa pada mata pelajaran bahasa indonesia materi struktur dan kebahasaan teks anekdot kelas x ips-2 sman 4 kota bima semester 1 tahun pelajaran 2020/2021," *j. pendidik. dan pembelajaran indones.*, vol. 2, no. 2, pp. 143–154, 2022, doi: <https://doi.org/10.53299/jppi.v2i2.219>.

- [6] H. Baek, M. Cho, S. Kim, H. Hwang, M. Song, and S. Yoo, "Analysis of length of hospital stay using electronic health records: a statistical and data mining approach," *plos one*, vol. 13, no. 4, p. e0195901, apr. 2018, doi: 10.1371/journal.pone.0195901.
- [7] I. Abdullah, B. Hudayana, P. M. Kutaneegara, and A. Indiyanto, "Beyond school reach: character education in three schools in Yogyakarta, Indonesia," *j. educ. soc. res.*, vol. 9, no. 3, pp. 145–159, sep. 2019, doi: 10.2478/jesr-2019-0032.
- [8] C. Diawati, N. Fadiawati, and K. Herlina, "Teachers' and students' perception about creative thinking skills, immersed integrated science learning, and project-based learning: a cow dung waste issue," *j. pendidik. dan pembelajaran kim.*, vol. 9, no. 2, pp. 108–113, 2020, doi: 10.23960/jpk.v9.i2.202010.
- [9] N. Fadila, "Pengembangan modul matematika berbasis accelerated learning pada materi himpunan di smkn 1 kota jambi," *j. eval. educ.*, vol. 2, no. 3, pp. 107–111, 2021, doi: 10.37251/jee.v2i3.216.
- [10] S. Midway, M. Robertson, S. Flinn, and M. Kaller, "Comparing multiple comparisons: practical guidance for choosing the best multiple comparisons test," *peerj*, vol. 8, pp. 1–26, 2020, doi: 10.7717/peerj.10387.
- [11] E. Fitriani, L. O. S. Arihi, and I. Ashari, "Penerapan model pembelajaran problem based learning untuk meningkatkan hasil belajar siswa pada pembelajaran ips di kelas iv," *J. Ilm. Pembelajaran Sekol. Dasar*, vol. 6, no. 1, pp. 68–79, 2024, doi: 10.36709/jipsd.v6i1.53.
- [12] S. Sunhaji, "Implementasi strategi cooperative learning dalam membentuk keterampilan berfikir peserta didik," *j. pendidik. agama islam indones.*, vol. 2, no. 4, pp. 61–64, 2021, doi: 10.37251/jpaii.v2i4.599.
- [13] F. Fitriyani, "Persepsi siswa terhadap lembar kegiatan siswa berbasis mind mapping pada mata pelajaran ipa terpadu materi tekanan zat cair," *schrödinger j. phys. educ.*, vol. 3, no. 1, pp. 10–12, 2022, doi: 10.37251/sjpe.v3i1.485.
- [14] R. Bellová, D. Melicherčíková, and P. Tomčík, "Possible reasons for low scientific literacy of slovak students in some natural science subjects," *Res. Sci. Technol. Educ.*, pp. 1–18, 2017, doi: 10.1080/02635143.2017.1367656.
- [15] H. Kurniawan, R. Y. Purwoko, and D. S. Setiana, "Integrating cultural artifacts and tradition from remote regions in developing mathematics lesson plans to enhance mathematical literacy," *J. Pedagog. Res.*, vol. 8, no. 1, pp. 61–74, 2024, doi: 10.33902/jpr.202423016.
- [16] T. P. Astuti, "Model problem based learning dengan mind mapping dalam pembelajaran ipa abad 21," *proceeding biol. educ.*, vol. 3, no. 1, pp. 64–73, 2019, doi: 10.21009/pbe.3-1.9.
- [17] D. Mahrunnisa, "Keterampilan pembelajar di abad ke-21," *jupenji j. pendidik. jompa indones.*, vol. 2, no. 1, pp. 101–109, 2023, doi: 10.57218/jupenji.vol2.iss1.598.
- [18] Z. Fajri, H. Baharun, C. Muali, Shofiatun, L. Farida, and Y. Wahyuningtiyas, "Student's learning motivation and interest; the effectiveness of online learning during covid-19 pandemic," *J. Phys. Conf. Ser.*, vol. 1899, no. 1, 2021, doi: 10.1088/1742-6596/1899/1/012178.
- [19] D. Kumalasari, H. Purwanta, and S. Aw, "Comparative analysis of generation z's digital history literacy in history education majors on java island: a study of history digital literacy," *J. Educ. E-Learning res.*, vol. 11, no. 1, pp. 90–96, 2024, doi: 10.20448/jeelr.v11i1.5342.
- [20] T. F. Kristiana And E. H. Radia, "Meta analisis penerapan model problem based learning dalam meningkatkan hasil belajar ipa siswa sekolah dasar," *J. Basicedu*, vol. 5, no. 2, pp. 818–826, 2021, doi: 10.31004/basicedu.v5i2.828.
- [21] Kamid, R. K. Dewi, D. A. Kurniawan, M. Z. Azzahra, and A. M. Nawahdani, "student learning difficulties in terms of the stif in framework of fractional material," *j. peneliti. dan pengemb. pendidik.*, vol. 7, no. 2, pp. 187–194, 2023, doi: 10.23887/jppp.v7i2.57371.
- [22] S. H. Lin And Y. C. Huang, "examining charisma in relation to students' interest in learning," *act. learn. high. educ.*, vol. 17, no. 2, pp. 139–151, 2016, doi: 10.1177/1469787416637481.
- [23] E. W. Simamora, "the effect of student team achievement division cooperative learning on the concept understanding ability of mathematic," vol. 104, no. 22, pp. 407–411, 2017, doi: 10.2991/aisteel-17.2017.87.
- [24] Y. Kuswardi, F. Nurhasanah, B. Usodo, H. Ekana, S. Sutopo, And M. Shahrill, "a learning trajectory for statistics through the traditional game of congklak to enhance mathematical reasoning skills," *int. j. pedagog. teach. educ.*, vol. 8, no. 1, p. 111, 2024, doi: 10.20961/ijpte.v8i1.90547.
- [25] A. Dengel, M. Z. Iqbal, S. Grafe, And E. Mangina, "A review on augmented reality authoring toolkits for education," *front. virtual real.*, vol. 3, no. april, pp. 1–15, 2022, doi: 10.3389/frvir.2022.798032.
- [26] D. Angraini, "kegiatan ekstrakurikuler pramuka dalam menerapkan karakter tanggung jawab di sekolah dasar," *indones. j. educ. res.*, vol. 2, no. 1, pp. 1–6, 2021, doi: 10.37251/ijoer.v2i1.515.
- [27] N. Yunita and T. Nurita, "analisis keterampilan proses sains siswa pada pembelajaran daring," *pensa e-jurnal pendidik. sains*, vol. 9, no. 3, pp. 378–385, 2021.
- [28] R. Sudrajat, "Pemanfaatan media ict pembelajaran pendidikan pancasila dan kewarganegaraan untuk meningkatkan kompetensi kewarganegaraan di sma 2 meranggen," *civis*, vol. ix, no. 1, pp. 40–60, 2020, [online]. available: <http://journal.upgris.ac.id/index.php/civis/article/viewfile/6082/3169>
- [29] R. N. Oktaviani, "implementasi model pembelajaran problem based learning (pbl) berbasis lesson study untuk meningkatkan keterampilan komunikasi dan kolaborasi mahasiswa pada mata kuliah perencanaan pembelajaran di SD," *ELSE (Elementary Sch. Educ. Journal) J. Pendidik. dan Pembelajaran Sekol. Dasar*, vol. 6, no. 2, p. 257, 2022, doi: 10.30651/else.v6i2.11095.
- [30] F. Alatas and L. Fauziah, "Model problem based learning untuk meningkatkan kemampuan literasi sains pada konsep pemanasan global," *JIPVA (Jurnal Pendidik. IPA Veteran)*, vol. 4, no. 2, p. 102, 2020, doi: 10.31331/jipva.v4i2.862.
- [31] I. Hidayanti and F. Wulandari, "The effect of problem-based learning based ethnoscience on science literacy ability of elementary school," *Edunesia J. Ilm. Pendidik.*, vol. 4, no. 3, pp. 967–982, 2023, doi: 10.51276/edu.v4i3.475.
- [32] A. Jalil, "Karakter pendidikan untuk membentuk pendidikan karakter," *Nadwa J. Pendidik. Islam*, vol. 6, no. 2, pp. 175–194, 2016, doi: 10.21580/nw.2012.6.2.586.
- [33] R. Zainul, B. Oktavia, and A. putra, "Pengenalan dan pengembangan e-modul bagi guru- guru anggota mgmp kimia dan biologi kota padang panjang," 2018, doi: 10.31227/osf.io/yhau2.

