

Critical thinking skills are essential for individuals to be able to analyze information, evaluate arguments, and solve problems effectively in their lives (Auliana, 2019; Oktariani & Ekadiansyah, 2020; Widiyanto, 2025). Considering that educational institutions play a central role in shaping a person's way of thinking, actively developing these skills is a primary task of the education system.

In the beginning 1997, the words –21st Century Skills have become part of the lexicon in education. Almost two decades, researchers were tasked with forecasting the potential difficulties that could emerge in the 21st century and identifying the learning strategies that could effectively address them. However, as we enter the 21st century, numerous publications emphasize the necessity of acquiring 21st-century skills in order to adequately equip students for success in a rapidly evolving world (González Salamanca, Agudelo, & Salinas 2020), in an increasingly competitive global market and upon thereafter joining the workforce. Critical thinking skills belong to higher-order thinking skills that need to be empowered in today's educational process. Critical thinking skills could be defined as logical and reflective thinking skills that focus on determining what must be done. An individual who could think critically are able to see and solve problems. Through the empowerment of these skills, students will be facilitated to become individuals who tend to have focus, find the reason, and conduct a comprehensive analysis to make a conclusion and solving a problem.

This pedagogical gap has a serious impact on student development. Due to lack of training, their critical thinking skills are not well developed (Agustina, 2025; Astuti, 2024; Weruin, 2022). As a result, many students, despite graduating with good grades, are unable to solve everyday problems or make rational decisions. This condition was clearly identified in Grade VII of SMP Negeri 1 Karau Kuala, where was the low learning outcomes were caused by a complex factor. External factors include the teacher's monotonous teaching style and the selection of inappropriate learning models. Meanwhile, internal student factors are also complex, ranging from concentration problems due to skipping breakfast, lack of motivation from parents to exhaustion from having to help the family work.

Facing this complex crisis, an intervention is needed that can fundamentally change classroom dynamics. Therefore, this study proposes the application of problem-solving methods as a learning innovation. This method has the potential to address

pedagogical and motivational issues simultaneously by shifting the focus of learning from the teacher to the student (Ezeddine, 2023; Kurniawan, 2019). In this approach, students are no longer passive listeners, but are instead required to actively engage, think critically, and collaborate to find solutions to the problems presented (Nurkhaeroni & Ripaiyah, 2022; Rizka, 2025). This challenging process is expected to break through boredom and significantly increase student engagement.

Based on the background of the problem and the innovative potential of the problem-solving method, this Classroom Action Research was formulated with a clear objective. This study aims to analyze and determine the extent to which the application of the problem-solving method can improve the learning outcomes of Grade VII students in Social Studies at SMP Negeri 1 Karau Kuala. It is hoped that this research can provide a practical contribution in the form of an effective learning model that can be replicated by teachers at the school. More broadly, the results of this study can also be a valuable case study regarding the application of active learning strategies in school environments with complex socio-economic challenges, thereby providing new insights for the world of education.

Method

This research was designed using the Classroom Action Research (CAR) method. This approach was chosen because the goal was to directly solve learning problems in the classroom, namely an effort to improve students' critical thinking skills. Specifically, this study applied the CAR model developed by Kemmis and Taggart, which is known for its systematic cycle flow (Saidah, 2024). Each cycle in this study consists of four interrelated stages: planning, acting, observing, and reflecting. It was conducted in class VII of SMP Negeri 1 Karau Kuala, with the subjects being all 19 students in the class. The research process lasted for a period of six months, starting from the preparation stage in February 2025 to the reporting stage in July 2025, with the core activity being the collection of classroom action data carried out over three months.

Data analysis in this study used a combined quantitative and qualitative approach. Quantitative data, derived from student test results, were analyzed descriptively to determine the level of learning completion. The success of the action was measured based on classical completion criteria, where a cycle was considered successful if more than 70% of students achieved a score above the Minimum Completion Criteria (KKM), which was 70.

Meanwhile, qualitative data derived from essay test answers, observation sheets, and field notes were analyzed to assess the development of students' critical thinking skills. This analysis covered five main aspects: problem identification, information analysis, argument evaluation, conclusion formulation, and idea delivery. This qualitative analysis process followed the stages of data reduction, data presentation, and conclusion drawing. The results of both analyses were then synthesized in the reflection stage at the end of each cycle to identify weaknesses and design improvements for the next cycle.

Result and Discussion

Result

In the pre-cycle phase, researchers conducted a comprehensive initial evaluation to map students' conditions before the intervention, combining qualitative and quantitative approaches. Qualitatively, systematic action planning was conducted through intensive collaboration with teachers and policymakers, as well as structured observations to understand students' mental attitudes. Meanwhile, quantitative data was collected through an initial critical thinking skills test conducted in the third week of May 2025. This test instrument consisted of 10 multiple-choice questions on the theme of social deviation and was given to 19 students. The combination of observational data and initial test results then served as the primary basis for designing an intervention framework aimed at improving students' mental attitudes and critical thinking skills.

Table 1. Percentage of Precycles

Score	f	%
40	1	5,26%
50	9	47,37%
60	6	31,58%
70	3	15,79%

Based on Table 1, the pre-cycle frequency data shows that the level of student mastery of the material is generally still very low. Of the total of 19 students, the majority or as many as 84.21% (16 students) have not been able to achieve the set completion standard, with scores in the range of 40 to 60. The distribution of these scores is dominated by a score of 50, which was achieved by 9 students (47.37%). Only a small

number of students, namely 3 people or 15.79%, managed to exceed the completion standard with a score of 70. This low percentage of success indicates the need for learning improvement actions.

Cycle 1

It was implemented in two sessions on June 2 and 5, 2025, with learning objectives designed in stages. The first session focused on conceptual understanding, where students learned to identify forms, analyze the causes, and impacts of social deviation. Furthermore, in the second session, students' competencies were advanced to the realm of problem-solving applications. They were trained to formulate issues, develop creative alternative solutions, evaluate the best solutions, and present them systematically. Overall, this cycle aimed to ensure students not only understood the theory but also were able to proactively and responsibly seek solutions to social problems. In the Classroom Action Research design stage, the researchers developed a systematic learning intervention to optimize the achievement of learning objectives. The adopted pedagogical strategy was based on the synergy between the scientific approach, the problem-based learning (PBL) model, and problem-solving methods. The entire framework and implementation steps of these strategies have been integrated and comprehensively documented in a teaching module, as attached to this research report.

In the first session, the learning process was initiated with the aim of introducing the material and identifying the problem. After preliminary activities such as apperception linking social phenomena to students' realities, the researcher explained the framework of the Problem-Solving method. The culmination of the core activity was the use of culturally relevant stimuli, namely video clips of bullying from Korean dramas, to spark students' interest and analysis through guided questions. Next, students were divided into heterogeneous groups to collaboratively examine the forms, causes, and impacts of observed social deviations, and formulate initial solution ideas. The session concluded with a short presentation, followed by conceptual reinforcement by the teacher to correct misconceptions and prepare students for a more in-depth problem-solving stage in the next meeting.

The second meeting was designed to improve students' competencies, moving from problem identification to systematic solution implementation. With more time allocated for guidance, students worked on Student Worksheets (LKPD) to practice problem-solving skills. They were structured to formulate specific problems, gather

relevant information, develop various alternative solutions, and conduct evaluations to select the most effective and rational solution. The researcher's role here was more as a facilitator, guiding group discussions. As a final evaluation instrument to measure the success of the learning cycle, an essay test was administered, allowing the researcher to observe and assess students' critical thinking skills more comprehensively and in-depth.

The learning evaluation process was conducted through two main approaches: group activity observation and individual critical thinking ability testing. During the observation, 19 students, divided into four heterogeneous groups, were assessed for their performance during discussions and presentations. The assessment focused on five aspects: presentation content, relevance to the case, collaboration, delivery method, and attitude. The results showed that three of the four groups achieved a "Good" rating, while one group received a "Fair" rating, indicating positive but uneven collaborative skills. To measure individual aspects, an essay test consisting of five questions was used. This test is comprehensively designed to assess various dimensions of critical thinking, from the ability to identify problems, analyze information, evaluate arguments, convey ideas, to formulate conclusions or solutions logically.

Table 2. Percentage of Cycles I

Score	f	%
34	1	5,26%
52	4	21,05%
61	6	31,58%
70	6	31,58%
79	2	10,53%

Table 2 presents the frequency distribution of student learning outcome scores in Cycle I. Based on these data; the minimum completion criterion was set at 70. The analysis showed that many students, 57.89%, failed to achieve this completion target, with scores ranging from 34 to 61. Meanwhile, only a small proportion, approximately 42.11%, exceeded the minimum threshold, achieving scores between 70 and 79. The highest scores were between 61 and 70. In conclusion, the results of Cycle I indicate that the learning objectives were not optimally achieved.

The evaluation revealed varying levels of achievement, with several significant weaknesses requiring improvement. In group work, collaboration was rated very good across all groups, and the majority were able to present relevant content. However, major

deficiencies were identified in attitude and delivery. Three-quarters of the groups demonstrated only "adequate" attitudes during discussions due to a lack of seriousness and mutual respect. Confidence issues also contributed to uneven delivery performance. Furthermore, individual critical thinking skills were still unsatisfactory, with 11 students (approximately 58%) still at the "adequate" level. This combination of weaknesses in discussion ethics and critical analysis provides a strong basis for improving learning in the next cycle.

Cycles II

The implementation of Cycle II, scheduled for two meetings on June 9 and 12, 2025, was designed as a corrective action based on reflections from the previous cycle. The learning objectives remained focused on improving students' competency in comprehensively analyzing social deviations, from identifying forms and analyzing causes to formulating preventive measures, as well as fostering a critical and caring attitude. The fundamental improvement in this cycle lay in changes to the learning media. Based on the evaluation, the use of video stimuli in Cycle I proved ineffective because it tended to trigger student discussions irrelevant to the learning objectives. Therefore, to improve focus and guide student analysis more effectively, the researchers replaced video media with the more focused and controlled use of images.

In the design stage of this Classroom Action Research, the researchers developed a systematic pedagogical framework to optimize the achievement of learning objectives. The formulated intervention strategy synergistically integrates several key elements: a scientific approach as the scientific foundation, the Problem-Based Learning (PBL) model as the main framework, and problem-solving methods supported by images for concept visualization. The learning activity begins with a structured introductory activity, including greetings, prayers, and apperception using images of orderly behavior to spark discussion about social norms. After the teacher conveys the motivation and learning objectives, students are divided into four heterogeneous groups, like the previous cycle. In the main activity, each group receives a different visual stimulus, consisting of two specific images representing various forms of social deviance, such as bullying, truancy, or vandalism. Through discussions guided by prompting questions from the teacher, students are encouraged to identify problems from the images, formulate essential questions, and independently seek information from various sources

to develop an initial understanding of the definition, examples, and causal factors of social deviance.

Following the data analysis and collection phase, the learning cycle proceeds to the verification phase, where each group presents their findings to the class. This presentation session is designed interactively, allowing other groups to provide responses, questions, or objections, with the teacher acting as a facilitator, guiding the discussion and providing clarification and reinforcement of concepts. The process then concludes with a class-wide conclusion to synthesize shared understanding. In the closing activity, the teacher and students reflected on the learning process that had taken place. As a follow-up, a group assignment was given to analyze a case in their local environment before the teacher presented the material for the next meeting and closed the lesson.

The learning evaluation process in this cycle was conducted comprehensively through collaboration with colleagues as observers. The observation results showed that the teacher's performance in implementing the learning was very good and in accordance with the teaching module, covering all stages from the introduction, core activities, to the closing. Of the 20 observation items, only one item related to timeliness was rated "partially achieved" due to the enthusiasm of students who asked questions at the closing. The assessment of student performance also showed very positive results, where all four discussion groups successfully obtained the predicate "Good" in their presentations.

Tabel 3. Percentage of Cycles II

Score	f	%
53	1	5,26%
60	3	15,79%
67	7	36,84%
81	6	31,58%
88.5	2	10,53%

Table 3 presents data on student learning outcomes after the implementation of Cycle II, which demonstrates significant improvement compared to the previous cycle. With a minimum completion criterion of 67, the analysis shows that most students, or 78.95%, successfully achieved the learning targets. Meanwhile, the percentage of students who did not exceed the minimum threshold decreased drastically to only

21.05%. This achievement indicates that the corrective actions implemented in Cycle II proved effective in improving student understanding and overall learning outcomes.

The results of Cycle II implementation showed significant and widespread improvement in students' critical thinking skills. Collaboratively, group performance in critical thinking reached 100%, a 25% increase from the previous cycle. A more substantial improvement was seen at the individual level, where the percentage of students competent in analyzing, evaluating, and formulating solutions jumped from 57.89% to 84.21%. Based on this significant increase, both at the group and individual levels, the researchers concluded that the learning improvement targets had been achieved, eliminating the need for further cycles of action.

Discussion

The analysis of this research's results began with the initial conditions in the pre-cycle stage, which indicated fundamental problems in students' critical thinking skills. Initial quantitative data revealed a very worrying picture, with most students, or 84.21%, failing to achieve the established mastery standards. This low achievement, with scores predominantly around 50, indicates that previous learning methods were ineffective in stimulating the analytical, evaluation, and problem-solving skills that are at the core of critical thinking. This condition reflects not simply a lack of mastery of the material, but rather the students' inability to apply conceptual knowledge to analyze social phenomena in depth. These findings provide strong justification for implementing a structured pedagogical intervention through Classroom Action Research, with a primary focus on implementing a learning model that explicitly trains higher-order thinking skills (Agustina, 2025).

The implementation of Cycle I marked the first improvement effort, which yielded progress, although not yet optimal. The completion rate increased from 15.79% to 42.11%, a positive leap indicating the potential of the problem-based learning and problem-solving framework. Observational data demonstrating strong group collaboration further corroborates this. However, the failure of most students (57.89%) to achieve completion indicates significant weaknesses in the intervention's implementation. Reflection results sharply identified the use of Korean drama video clips as a primary source of stimulation. This media, while culturally relevant, proved counterproductive because its narrative and entertaining nature tended to distract students from analyzing the social issues that were the learning objectives (Apriani,

2025; Widiyanto, 2025). Students focused more on discussing the storyline or characters, thus hindering and shallowing essential critical thinking processes (Ediansyah, 2022).

The turning point in the success of this research lies in the corrective actions taken in Cycle II, which were based on critical reflections from the previous cycle. The fundamental change was the replacement of dynamic video learning media with static, more focused images. This strategic decision directly addressed the major weaknesses identified in Cycle I. Images have proven to be a far more effective stimulus for problem-based learning in this context (Indriani, 2021; Widodo, 2018). Their static nature allows students to make more in-depth, focused, and analytical observations without being distracted by the storyline. The use of images representing various forms of social deviance effectively sparked more substantive and relevant discussions, encouraging students to actively identify problems, formulate questions, and seek solutions—essentials of the scientific approach and problem-solving (Cahyaningrum, 2020; Sutarni & Aryuana, 2023).

The strategic changes to learning media in Cycle II directly correlated with a significant improvement in learning outcomes. The student completion rate jumped dramatically from 42.11% to 78.95%, indicating that the majority of students were now able to achieve the learning targets. This improvement was not only evident in the quantitative scores on the essay test but was also reinforced by qualitative data from observations. All discussion groups successfully achieved the predicate "Good", and more importantly, individual critical thinking competencies increased from 57.89% to 84.21%. This leap proves that students are not only able to answer questions, but there has been a significant increase in capabilities in analyzing, evaluating, and formulating solutions logically and systematically. This success confirms that the intervention carried out in Cycle II has effectively achieved its goal of improving students' critical thinking skills. This achievement is in line with the findings of other studies that show that the use of appropriate visual media, such as images, can significantly increase student engagement and learning motivation, contributing to better learning outcomes (Ratnaningsih & Nastiti, 2018).

The overall success of this study cannot be attributed to a single factor, but rather to the effective synergy between the pedagogical framework and the appropriate media selection. The Problem-Based Learning (PBL) model combined with problem-solving methods provides a robust structure for students to learn actively and collaboratively. However, this framework can only function optimally when supported by the right

stimuli (Nurjannah, 2022; Nurkhaeroni & Ripaiyah, 2022). Cycle I demonstrated that PBL can fail if the media used are not aligned with the learning objectives. Conversely, Cycle II demonstrated that when PBL is paired with focused media such as images, it becomes a powerful tool for developing critical thinking skills. The key lesson is that the effectiveness of a learning model depends heavily on its technical implementation, with media selection playing a crucial role in directing and maintaining students' focus on the learning process.

The results of this study offer several important implications for teaching practice, particularly in social studies subjects. First, this study reaffirms the importance of active learning approaches such as PBL for developing higher-order thinking skills, beyond mere memorization. Second, and most importantly, this study provides concrete evidence regarding the crucial importance of carefully selecting learning media. Teachers must critically evaluate whether a medium will serve as a facilitator of analysis or a source of distraction (Hutagalung, 2022; Zainuddin, 2019). In the context of training critical thinking, simple, focused media such as images have been shown to be far more effective than complex, dynamic media such as videos. A final implication is the value of Classroom Action Research itself as a model for teacher professional development, enabling a continuous cycle of improvement based on real-world data and reflection in the classroom (Geerts, 2017).

Conclusion

This Classroom Action Research (CLSR) demonstrates that the application of problem-solving methods supported by appropriate learning media significantly improves students' critical thinking skills. Starting from a pre-cycle condition where only 15.79% of students completed the task, the implementation of Cycle I with video media increased the completion rate to 42.11%. However, reflection showed that the video media actually became a distraction. The turning point occurred in Cycle II, where replacing video media with more focused static images proved highly effective. This strategic change skyrocketed the student completion rate to 78.95% and increased individual critical thinking competency to 84.21%. This success demonstrates that the synergy between active learning models such as Problem-Based Learning and careful media selection is key to optimizing learning outcomes and fostering higher-order thinking skills in students.

References

- Agustina, M. (2025). Mengembangkan soft skill siswa melalui model pembelajaran problem-based learning (pbl) di SMKN 3 Palangka Raya. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 5(3), 1473. <https://doi.org/10.51878/learning.v5i3.6516>
- Anggraeni, A. (2021). Analysis of learning outcomes and error identification in temperature and heat cognitive tes. *ScienceEdu*, 4(2), 56. <https://doi.org/10.19184/se.v4i2.24386>
- Apriani, K. A. (2025). Pengaruh aplikasi tiktok terhadap minat belajar siswa pada mata pelajaran ipas materi interaksi sosial di sd n o8 palembang. *SCIENCE Jurnal Inovasi Pendidikan Matematika Dan IPA*, 5(1), 258. <https://doi.org/10.51878/science.v5i1.4270>
- Astuti, N. N. P. (2024). Internalisasi nilai-nilai dalam membentuk profil pelajar pancasila di ma manhalul ma'arif darek. *SOCIAL Jurnal Inovasi Pendidikan IPS*, 4(3), 155. <https://doi.org/10.51878/social.v4i3.3233>
- Auliana, Y. (2019). Pengaruh model problem based learning terhadap keterampilan berpikir kritis siswa smp. *Jurnal Pendidikan Dan Pembelajaran Sains Indonesia (JPPSI)*, 2(2), 127. <https://doi.org/10.23887/jppsi.v2i2.19380>
- Azzahrah, W. N. (2025). Analisis kebutuhan modul ipas berbasis contextual teaching and learning untuk meningkatkan karakter rasa ingin tahu dan minat belajar siswa kelas iv sd. *SCIENCE Jurnal Inovasi Pendidikan Matematika Dan IPA*, 5(2), 936. <https://doi.org/10.51878/science.v5i2.5714>
- Cahyaningrum, I. (2020). Efektivitas strategi think talk write terhadap kemampuan pemecahan masalah matematis siswa. *Edumatika Jurnal Riset Pendidikan Matematika*, 3(1), 23. <https://doi.org/10.32939/ejrpm.v3i1.405>
- Dirman, D. (2025). Implementasi pembelajaran berdiferensiasi untuk mencapai standar proses pendidikan di smp. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 5(1), 384. <https://doi.org/10.51878/learning.v5i1.4568>
- Ediansyah, E. (2022). The influence of role-playing method on social science learning outcomes. *JMKSP (Jurnal Manajemen Kepemimpinan Dan Supervisi Pendidikan)*, 7(2), 786. <https://doi.org/10.31851/jmksp.v7i2.11755>
- Ezeddine, G. (2023). The problem-solving method: Efficacy for learning and motivation in the field of physical education. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.1041252>
- Geerts, W. (2017). Effect of video-cases on the acquisition of situated knowledge of teachers. *International Education Studies*, 11(1), 64. <https://doi.org/10.5539/ies.v11n1p64>
- Hutagalung, I. S. R. (2022). German learning media application in class x senior high school. *EDUKATIF JURNAL ILMU PENDIDIKAN*, 4(3), 3255. <https://doi.org/10.31004/edukatif.v4i3.2687>

- Indriani, R. I. (2021). Improvement of beginning writing skills using image media. *Kalam Cendekia Jurnal Ilmiah Kependidikan*, 9(1). <https://doi.org/10.20961/jkc.v9i1.53834>
- Kurniawan, A. (2019). Pengaruh metode problem solving dan kooperatif tipe think pair share terhadap prestasi belajar ips di sekolah dasar islam terpadu. *Edueksos Jurnal Pendidikan Sosial & Ekonomi*, 8(2). <https://doi.org/10.24235/edueksos.v8i2.5243>
- Masruroh, C. (2025). Peran guru dalam mengembangkan kurikulum merdeka di smp it al-ittihad salaman. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 5(1), 322. <https://doi.org/10.51878/learning.v5i1.4148>
- Nurjannah, S. (2022). Implementation analysis of problem based learning model and the correlation of the creative attitude of class x students on chemical bonding materials. *Integrated Science Education Journal*, 3(3), 92. <https://doi.org/10.37251/isej.v3i3.277>
- Nurkhaeroni, U., & Ripaiyah. (2022). Sosialisasi penggunaan media pembelajaran e-learning berbasis model problem based learning dalam meningkatkan motivasi belajar dan hasil belajar peserta didik di ma putra al-islahuddiny kediri kabupaten lombok barat. *Jurnal Pengabdian Magister Pendidikan IPA*, 5(2), 190. <https://doi.org/10.29303/jpmipi.v5i2.1598>
- Oktariani, O., & Ekadiansyah, E. (2020). Peran literasi dalam pengembangan kemampuan berpikir kritis. *Jurnal Penelitian Pendidikan Psikologi Dan Kesehatan (J-P3K)*, 1(1), 23. <https://doi.org/10.51849/j-p3k.v1i1.11>
- Putri, M. A. R. S. (2024). Pengaruh model pembelajaran pbl berbasis artificial intelligence terhadap hasil belajar siswa. *SOCIAL Jurnal Inovasi Pendidikan IPS*, 4(3), 145. <https://doi.org/10.51878/social.v4i3.3256>
- Ratnaningsih, S., & Nastiti, G. (2018). Upaya meningkatkan motivasi belajar siswa dengan menggunakan media gambar pada pembelajaran tematik di sekolah dasar. *Al Ibtida Jurnal Pendidikan Guru MI*, 5(2), 275. <https://doi.org/10.24235/al.ibtida.snj.v5i2.3397>
- Rizka, R. S. P. (2025). Penerapan pembelajaran berdiferensiasi dengan model problem based learning dalam meningkatkan hasil belajar siswa. *SCIENCE Jurnal Inovasi Pendidikan Matematika Dan IPA*, 5(3), 1372. <https://doi.org/10.51878/science.v5i3.5625>
- Saidah, N. A. (2024). Meningkatkan keterampilan berfikir kreatif peserta didik dengan model pbl kelas vii. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 4(2), 361. <https://doi.org/10.51878/learning.v4i2.2902>
- Setiawati, L. (2020). Practicality of life skills-based student worksheets to improve critical thinking in respiratory system material of senior high school. *Journal of Educational Sciences*, 4(3), 632. <https://doi.org/10.31258/jes.4.3.p.632-642>
- Suardiani, N. P. (2025). Analisis kesenjangan antara ekspektasi dan realitas dalam pembelajaran ips di sekolah dasar: Pendekatan studi kasus. *SOCIAL Jurnal Inovasi Pendidikan IPS*, 4(4), 651. <https://doi.org/10.51878/social.v4i4.4463>

- Sutarni, S., & Aryuana, A. (2023). Realistic mathematics education (rme): Implementation of learning models for improving hots-oriented mathematics problem-solving ability. *AL-ISHLAH Jurnal Pendidikan*, 15(2), 1213. <https://doi.org/10.35445/alishlah.v15i2.2127>
- Weruin, U. U. (2022). Belajar berpikir kritis bersama siswa-siswi sma bhinneka tunggal ika jakarta. *Jurnal Bakti Masyarakat Indonesia*, 5(1). <https://doi.org/10.24912/jbmi.v5i1.18235>
- Widianto, W. (2025). Pengaruh media audio visual terhadap minat belajar siswa bahasa indonesia materi kosakata di sdn 148 Palembang. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, 5(3), 1434. <https://doi.org/10.51878/learning.v5i3.6031>
- Widodo, S. A. (2018). Improving mathematical problem solving skills through visual media. *Journal of Physics Conference Series*, 948, 12004. <https://doi.org/10.1088/1742-6596/948/1/012004>
- Zainuddin. (2019). Developing the interactive multimedia in physics learning. *Journal of Physics Conference Series*, 1171, 12019. <https://doi.org/10.1088/1742-6596/1171/1/012019>