Journal of Chemical Learning Innovation
Vol. 2, No. 1, June 2025, pp. 120~127
ISSN: 3063-0886, DOI:10.37251/jocli.v2i1.1966

Fostering Better Chemistry Learning Outcomes with the Cooperative Integrated Reading and Composition Learning Model

Nur Mustofa[1], Indah Sri Wahyuni[2]
[1]Faculty of Education and Teaching, Sultan Syarif Kasim State Islamic University of Riau, Pekanbaru, Indonesia
[2]LKMD Sukaramai Senior High School, Tapung Hulu District, Kampar Regency, Riau, Indonesia

Article Info

Article history:

Received Apr 21, 2025
Revised May 25, 2025
Accepted Jun 22, 2025
OnlineFirst Jun 30, 2025

Keywords:

Learning Outcomes
Chemistry
CIRC
Cooperative Learning Model

ABSTRACT

Purpose of the study: The purpose of this study was to improve the chemistry learning outcomes of class X students of LKMD Sukaramai Tapung Hulu Senior High School by implementing the cooperative learning model of the Cooperative Integrated Reading and Composition type.

Methodology: The subjects in this study were 18 students of class X of LKMD Sukaramai Tapung Hulu Senior High School. While the object of this study is the application of the cooperative learning model of the Cooperative Integrated Reading and Composition type to improve the chemistry learning outcomes of class X students of LKMD Sukaramai Tapung Hulu Senior High School.

Main Findings: Based on the research results, the implementation of cooperative learning strategies of the Cooperative Integrated Reading and Composition type in the learning process in class X of LKMD Sukaramai Tapung Hulu Senior High School increased student learning outcomes. From the analysis of data on the success of the action, it was found that there was an increase in the number of students who had scores above 65 after the action compared to the number of students who had scores above 65 before the action with a percentage of completion of 33.3%, and in the first daily test increased by 55.6%. While in the second daily test, all students (100%) obtained a minimum score or above 65.

Novelty/Originality of this study: The novelty of this study is to determine the effectiveness of implementing the cooperative integrated reading and composition type of cooperative learning model to improve chemistry learning outcomes.

Corresponding Author:
Nur Mustofa,
Faculty of Education and Teaching, Sultan Syarif Kasim State Islamic University, Riau
Jl. H.R. Soebrantas KM. 15 No. 155 Tuah Madani Kec. Tuah Madani – Pekanbaru
Email: nrmustmustofa@gmail.com

1. INTRODUCTION

The ability of students to receive and practice the learning outcomes obtained is a key factor in achieving success in the teaching and learning process. Teachers as direct implementers in the field have a central role in determining the success of education [1], [2]. The core of all of this is the interaction process between teachers and students in an activity called the learning process [3], [4]. Therefore, teaching is a series of activities to deliver learning materials to students so that they can receive, respond, master and develop the learning materials [5], [6].

One of the goals of education is to prepare students who are faithful, pious, creative and innovative and have scientific insight and are also prepared to continue their education to a higher level of education. Efforts to

prepare students to achieve these goals require a set of learning provided to students including Chemistry subjects [7]-[9].

The science that studies the universe is called Natural Science. Chemistry is one of the sciences. The universe is an event that can be separated into chemistry, physics, and biology [10], [11]. But the universe itself does not recognize this distinction. This distinction is only to facilitate our understanding of events in nature. There are many benefits to be gained from studying chemistry. The immediate benefit we gain from studying chemistry is a better understanding of the natural environment and the various processes that take place in it [12], [13], so that we can control these changes for the benefit of human life and the environment. A further benefit of studying chemistry is to transform natural materials into more useful products to meet our needs [14], [15], for example making soap from palm oil.

The modern world is a world where humans have become accustomed to the convenience obtained from chemistry [16], [17]. Think about soap, toothpaste, textiles, cosmetics, plastics, medicines, fertilizers, pesticides, fuels, paints, cooking spices, and various types of processed foods. All of these are the results of the application of chemistry. Almost all of our necessities, more or less, either directly or indirectly, experience chemical contact. Not only everyday necessities, chemistry also plays a big role in various types of technological products such as television sets, refrigerators, and airplanes. From the description above, it can be explained how important it is to apply Chemistry lessons to students. In relation to this, in LKMD Sukaramai Tapung Hulu Senior High School, Chemistry lessons have been taught to students and attempts to maximize students' Chemistry learning outcomes.

Based on the preliminary study conducted by the author, the author found symptoms in the Chemistry learning process, namely: (1) Only 2 (two) students were able to answer the teacher's questions correctly when an evaluation was carried out with questions and answers, (2) Lack of student mastery of the material taught, this can be seen from the results of daily tests carried out and the students' mid-semester scores which were mostly below the Minimum Completion Criteria score, namely 6.5, (3) Lack of student desire to ask the teacher or collaborate with other students. The above facts show that the results of science learning, especially in chemistry lessons, are generally low. One of the teacher's efforts that can be done is to apply a learning strategy that aims to activate students, namely so that students are willing to ask about the material being studied first to their group members, are enthusiastic about doing exercises and have a sense of responsibility for their tasks and groups. So it is necessary to use cooperative learning. Currently, cooperative learning is increasingly developing. One of the cooperative learning types is the Cooperative Integrated Reading and Composition type.

All Cooperative learning methods contribute to the idea that students who work together in learning are responsible for their teammates are able to make themselves learn equally well [18], [19]. One of the Cooperative learning models that can be used is Cooperative Integrated Reading and Composition learning [20]-[22]. Students in Cooperative Integrated Reading and Composition receive direct instruction on lessons such as metacognitive strategies [23], [24]. This integrated teaching specifically develops materials that are different from the materials used in related basic teaching [25], [26]. Based on the explanation above, it can be concluded that Cooperative Integrated Reading and Composition is one of the effective Cooperative learning models (group work) for teaching skills [27], [28], then it is expected that through Cooperative learning students are able to work together and help each other, in addition before students learn more about the material being taught, students first read the material, thus students find it easier to understand the subject matter, which in turn student learning outcomes can be achieved optimally.

Research conducted by Nurainun and Nasution [21] and Nasution [29] both show that the Cooperative Integrated Reading and Composition learning model is effective in improving students' reading skills, particularly in the context of language learning at the elementary and secondary school levels. Both focus on aspects of language literacy, namely reading skills and text comprehension, without reaching the realm of exact subjects such as chemistry. This indicates the limitations of the application of the Cooperative Integrated Reading and Composition model in science fields that require more complex conceptual and analytical understanding. Therefore, this study aims to fill this gap by applying the Cooperative Integrated Reading and Composition model in the context of chemistry learning, to see the extent to which this model can improve student learning outcomes in conceptual subjects, thereby expanding the scope of Cooperative Integrated Reading and Composition use from language literacy to the realm of scientific literacy.

This research is novel because it applies the Cooperative Integrated Reading and Composition model, previously used more in language literacy learning, to the context of conceptual and analytical chemistry learning. This approach offers a structured cooperative learning strategy through integrated reading and writing activities to strengthen the understanding of chemical concepts collaboratively [30], [31]. The urgency of this research lies in the low chemistry learning outcomes of students which are often caused by learning methods that are less varied and do not actively involve students. By adapting the Cooperative Integrated Reading and Composition model in chemistry learning, this research is expected to be an innovative alternative that not only improves conceptual understanding but also develops scientific literacy skills and collaboration among students, which are highly needed in 21st-century learning. The purpose of this study was to improve the chemistry learning outcomes of

class X students of LKMD Sukaramai Tapung Hulu Senior High School by implementing the cooperative learning model of the Cooperative Integrated Reading and Composition type.

2. RESEARCH METHOD

2.1. Type of Research

This research is a classroom action research aimed at improving student learning outcomes through the implementation of a specific learning model [32], [33]. The research design follows the Kemmis and McTaggart model, which involves a cycle of planning, action, observation, and reflection [34], [35]. The study was conducted in two cycles, each consisting of two meetings, to ensure improvements in the teaching and learning process and to address any obstacles encountered in the previous cycle.

2.2. Subject and Object of the Research

This classroom action research was conducted in the tenth-grade students of LKMD Sukaramai Senior High School, Tapung Hulu District, Kampar Regency. The subject of the study was chemistry, focusing on the topic of the Periodic Table of Elements. The research participants consisted of 18 tenth-grade students, comprising 8 girls and 10 boys. The object of this research was the application of the Cooperative Integrated Reading and Composition cooperative learning model to improve chemistry learning outcomes.

2.3. Instruments and Data Collection Techniques

The instruments used in this research consisted of observation sheets and achievement tests. The observation sheets were used to collect qualitative data on student activities and teacher performance during the learning process [36], [37]. Meanwhile, the tests were used to collect quantitative data on student learning outcomes at the end of each cycle. Student activity data were collected during each learning session, while learning outcomes were measured using daily tests conducted at the end of each cycle [38], [39]. The success criteria of the learning were determined based on the percentage of students who achieved a minimum score of 65 (Minimum Completion Criteria) with at least 75% class mastery.

2.4. Data Analysis Techniques

The data analysis technique in this study used descriptive quantitative and qualitative approaches. Observation data on student activities were analyzed by calculating the percentage of students who performed each activity indicator in the observation sheet [40], [41]. Learning outcomes data were analyzed using frequency and percentage distribution to determine the level of completeness before and after the action. The comparison of student mastery levels from pre-action, cycle I, and cycle II became the main indicator of the effectiveness of the implemented learning model.

2.5. Research Procedure

The research procedure followed the stages of classroom action research as proposed by Kemmis and McTaggart. In the planning stage, the researcher prepared the learning tools such as lesson plans, student worksheets, observation sheets, and test questions. In the action stage, the teacher implemented the learning process using the Cooperative Integrated Reading and Composition model, where students were grouped and engaged in reading, discussing, composing, and presenting the material collaboratively. The observation stage involved collecting data on student activities and teacher performance using observation sheets. In the reflection stage, the researcher and teacher reviewed the results of the observation and student learning outcomes to evaluate the success of the learning process and identify areas for improvement. Based on reflection in cycle I, some improvements were made in cycle II, including more engaging teacher explanations and better guidance during group work, which led to increased student activity and learning outcomes.

3. RESULTS AND DISCUSSION

3.1. Student Activities

To find out student activities through the implementation of the cooperative learning model type Cooperative Integrated Reading and Composition, observations were made on student activities during the learning process. Then the data obtained through the observation sheet were analyzed. From the results of observations guided by the observation sheet and implementation carried out by researchers in cycle I, there were still shortcomings. While in cycle II, based on the results of observations guided by the observation sheet, activities at each step had gone well. On average, students followed the learning according to the procedure. Overall, the implementation of the cooperative learning model type Cooperative Integrated Reading and Composition ran smoothly because students followed the learning process well.

The results of observations of student activities in cycle I and cycle II can be seen in the table below:

Table 1. Comparison of Student Activities in Cycle I and Cycle II

No.	Student Activities	Cycle I	Cycle II
1.	Forming groups quickly, correctly, and orderly, and according to the teacher's instructions	77.8% (14 students)	94.4% (17 students)
2.	Paying serious attention to the outline of the material to be studied	80.6% (15 students)	94.4% (17 students)
3.	Paying attention to the teacher's explanation and accepting assignments well	69.4% (13 students)	88.9% (16 students)
4.	Reading the Student Worksheet in an orderly manner	77.8% (14 students)	91.7% (17 students)
5.	Working collaboratively in groups to complete the Student Worksheet on time	80.6% (15 students)	91.7% (17 students)
6.	Following the teacher's guidance in an orderly manner when completing the Student Worksheet	72.2% (13 students)	86.1% (16 students)
7.	Presenting group work results to the class on time	80.6% (15 students)	91.7% (17 students)
8.	Assisting the teacher in concluding the lesson	75.0% (14 students)	86.1% (16 students)
	Average	76.8% (±14 students)	90.6% (16 students)

The results of observations of student activities in cycle I, it is known that the average student activity when forming their groups quickly, correctly, orderly, and according to teacher instructions was obtained by 77.8% of students (14 people). When students pay attention to the outline of the material to be studied solemnly, 80.6% of students (15 people) were obtained. Then the activity of paying serious attention to the teacher's explanation, and receiving assignments given by the teacher well was obtained by 69.4% of students (13 people). The next student activity is reading the Student Worksheet orderly in which there is a discourse to be discussed obtained by 77.8% of students (14 people). Furthermore, when working together in their groups to complete the Student Worksheet according to the specified time, 80.6% of students (15 people) obtained it, and when following the teacher's guidance well and orderly in working on the Student Worksheet, 72.2% of students (13 people) obtained it. Meanwhile, when presenting the results of group work to the front of the class well and according to the specified time, 80.6% of students (15 people) obtained it, and when helping the teacher in making lesson conclusions, 75% of students (14 people) obtained it.

Furthermore, regarding the results of observations of student activities in cycle II, it is known that the average student activity when forming their groups quickly, correctly, orderly, and according to teacher instructions was obtained by 94.4% of students (17 people). When students pay attention to the outline of the material to be studied solemnly, 94.4% of students (17 people) obtained it. Then the activity of paying serious attention to the teacher's explanation, and receiving assignments given by the teacher well was obtained by 88.9% of students (16 people). The next student activity is to read the Student Worksheet orderly in which there is a discourse to be discussed, obtained by 91.7% of students (17 people). Furthermore, when working together in their groups to complete the Student Worksheet according to the specified time, 91.7% of students (17 people) were obtained, and when following the teacher's guidance well and orderly in working on the Student Worksheet, there were 86.1% of students (16 people). Meanwhile, when presenting the results of group work to the front of the class well and according to the specified time, 91.7% of students (17 people) were obtained, and when helping the teacher in making lesson conclusions, 86.1% of students (16 people) were obtained. The average percentage of student activity in cycle II was 90.6% or 16 students. This increase was obtained after improvements were made in the second cycle. Where the teacher provides an explanation that can attract students' attention in learning [42], [43]. As well as providing motivation to students about the importance of the subject matter being studied, and increasing learning activities by correcting the teacher's weaknesses in implementing the Cooperative Integrated Reading and Composition learning model [44], [45]. So that through these improvements, learning activities increase.

3.2. Learning outcomes

The learning outcomes of class X students of LKMD Sukaramai Senior High School, Tapung Hulu District, Kampar Regency have increased when compared to before the implementation of the cooperative learning model of the Cooperative Integrated Reading and Composition type until the second cycle. Then regarding the increase in student learning outcomes from before the action, cycle I, and cycle II, it is known that there were only

6 students who completed the action before the action, while in cycle I it increased to 10 students, and in cycle II all students or 18 students were obtained. As seen in this study, the number of students who achieved completion in learning on daily test I and daily test II increased. This is because students have been able to master the material taught well. In addition, student motivation and activity to follow the chemistry learning process are getting better. This indicates that the implementation of the cooperative learning model of the Cooperative Integrated Reading and Composition type can improve the activity and chemistry learning outcomes of class X students of Cooperative Integrated Reading and Composition. The distribution of the frequency distribution of student learning outcomes is shown in the following bar diagram:

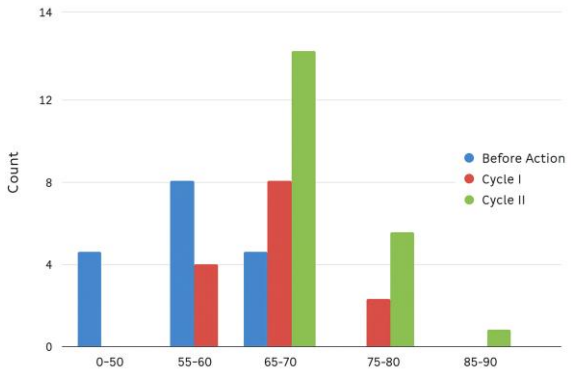

Figure 1. Histogram of Student Learning Outcomes

The application of the cooperative learning model type Cooperative Integrated Reading and Composition in the learning process can improve the learning outcomes of class X students of LKMD Sukaramai Senior High School, Tapung Hulu District, Kampar Regency. From the data analysis on the success of the action, it was found that there was an increase in the number of students who had scores above 65 after the action compared to the number of students who had scores above 65 before the action with the percentage of completion on daily test I was 65.28%. There was an increase from daily test I to daily test II to 100%. The application of the cooperative learning model type Cooperative Integrated Reading and Composition can improve the activity and learning outcomes of chemistry of class X students LKMD Sukaramai Senior High School, Tapung Hulu District, Kampar Regency.

The implementation of the Cooperative Integrated Reading and Composition cooperative learning model has been proven to improve student learning activities. This is reflected in increased student engagement in various learning stages, from group formation and listening to material, to collaborative assignment completion. This improvement indicates that the Cooperative Integrated Reading and Composition approach successfully creates a learning environment that encourages active student participation and increases their adherence to established learning procedures.

The successful implementation of this model is inseparable from the improvement efforts made between cycles I and II. In the second cycle, teachers made adjustments to material delivery and more effective motivational strategies. This resulted in increased student concentration and enthusiasm in participating in each learning activity. These improvements also reflect the teacher's important role in creating a conducive learning climate that is responsive to students' learning needs.

Furthermore, increased learning activities directly contribute to student learning outcomes. The increasing trend in the number of students achieving learning mastery indicates that the Cooperative Integrated Reading and Composition model not only increases engagement but also increases the effectiveness of material understanding. This reinforces the assumption that collaborative text-based learning and discussion encourage students to more actively construct knowledge through interaction with their group mates.

The Cooperative Integrated Reading and Composition learning model consistently demonstrates a positive impact on students' chemistry learning outcomes. Improvements in learning outcomes from before the intervention to the second cycle reflect the success of the learning intervention. Furthermore, the achievement of overall learning mastery in the second cycle indicates that all students have mastered the material according to the established competency standards.

In terms of implementation, the Cooperative Integrated Reading and Composition model provides space for students to not only absorb information but also develop social skills through teamwork. Collaboration in understanding the material, discussing it, and completing assignments provides a more meaningful learning experience. This makes Cooperative Integrated Reading and Composition a relevant model to implement, especially in learning that demands active participation and in-depth understanding.

Therefore, it can be concluded that the Cooperative Integrated Reading and Composition model is an effective approach in increasing student activity and learning outcomes. This success is certainly inseparable from

the teacher's active role in designing adaptive learning, as well as the students' ability to interact productively in groups. This model can be an alternative solution to the challenges of conventional learning, which tends to be passive and lacks student engagement.

This research has had a positive impact on education, particularly in the implementation of the Cooperative Integrated Reading and Composition cooperative learning model at the secondary school level. The results indicate that this model significantly improves student activity and learning outcomes. This improvement demonstrates that collaborative-based learning strategies can be an effective alternative for increasing student participation and understanding, particularly in subjects that tend to be abstract, such as chemistry. Furthermore, this research also provides practical contributions for teachers in designing more structured, interactive, and results-oriented teaching and learning activities.

However, this study has several limitations that require consideration. First, the scope of the study was limited to one class in one school, so the results cannot be broadly generalized to different contexts, such as schools with different student characteristics or facilities. Second, the relatively short implementation time of two learning cycles may not be sufficient to observe the long-term impact of the Cooperative Integrated Reading and Composition learning model. Third, the measurement of student activity relies on subjective observation instruments, which may introduce bias in data recording or interpretation. Therefore, further research with a broader scope, longer duration, and more diverse evaluation methods is needed to strengthen these findings.

4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that the application of the cooperative learning model of the Cooperative Integrated Reading and Composition type in chemistry learning can improve the activity and results of students' chemistry learning on the periodic system material in class X of SMA LKMD Sukaramai, Tapung Hulu District, Kampar Regency. Further research is recommended to test the effectiveness of the Cooperative Integrated Reading and Composition model on other chemistry topics and at different educational levels to assess the consistency of student learning outcomes. Furthermore, the Cooperative Integrated Reading and Composition model can be developed in combination with digital learning media to enhance engagement and deeper understanding of chemistry concepts.

ACKNOWLEDGEMENTS

The researchers would like to express their deepest gratitude to all parties who have assisted in this research.

REFERENCES

[1] A. Dirsa, S. Anggreni BP, C. Diananseri, and I. Setiawan, "Teacher Role as Professional Educator in School Environment," *Int. J. Sci. Educ. Cult. Stud.*, vol. 1, no. 1, pp. 32–41, Nov. 2022, doi: 10.58291/ijsecs.v1i1.25.

[2] C. Amelia, A. Aprilianto, D. Supriatna, I. Rusydi, and N. E. Zahari, "The Principal's Role as Education Supervisor in Improving Teacher Professionalism," *Nidhomul Haq J. Manaj. Pendidik. Islam*, vol. 7, no. 1, pp. 144–155, Apr. 2022, doi: 10.31538/ndh.v7i1.2075.

[3] S. Setyaningsih and Y. Suchyadi, "Classroom management in improving school learning processes in the cluster 2 teacher working group in north bogor city," *JHSS (JOURNAL Humanit. Soc. Stud.*, vol. 5, no. 1, pp. 99–104, Mar. 2021, doi: 10.33751/jhss.v5i1.3906.

[4] X. Ma, Y. Xie, and H. Wang, "Construction and Verification Study on the Hierarchical Model of Teacher–Student Interaction Evaluation for Smart Classroom," *Asia-Pacific Educ. Res.*, vol. 34, no. 3, pp. 1169–1180, Jun. 2025, doi: 10.1007/s40299-024-00931-5.

[5] C. U. Osuji and I. Catherine, "Material Resources Management for Effective Teaching and Learning in Nigerian Tertiary Education : Implications for Quality Tertiary Education Delivery," *Int. J. Innov. Educ. Res.*, vol. 9, no. 3, pp. 13–28, 2021.

[6] B. L. Moorhouse and K. M. Wong, "Blending asynchronous and synchronous digital technologies and instructional approaches to facilitate remote learning," *J. Comput. Educ.*, vol. 9, no. 1, pp. 51–70, Mar. 2022, doi: 10.1007/s40692-021-00195-8.

[7] G. M. Chans and M. Portuguez Castro, "Gamification as a Strategy to Increase Motivation and Engagement in Higher Education Chemistry Students," *Computers*, vol. 10, no. 10, p. 132, Oct. 2021, doi: 10.3390/computers10100132.

[8] S. McGuire, S. Y. McGuire, and T. Angelo, *Teach Students How to Learn*. New York: Routledge, 2023. doi: 10.4324/9781003447313.

[9] E. Nsabayezu, O. Habimana, W. Nzabalirwa, and F. N. Niyonzima, "Contribution of Activities-Enhanced Rubrics in the Multimedia-Supported Flipped Classroom Approach on Students' Conceptual Understanding in Organic Chemistry: A Scoping Review," *Int. J. Technol. Learn.*, vol. 32, no. 1, pp. 77–112, 2024, doi: 10.18848/2327-0144/CGP/v32i01/77-112.

[10] S. S. Obloqulov, "The Main Tasks of Toxicological Chemistry," *Galaxy Int. Interdiscip. Res. J.*, vol. 10, no. 11, pp. 168–170, 2022.

[11] A. Baiardi, M. Christandl, and M. Reiher, "Quantum Computing for Molecular Biology," *ChemBioChem*, vol. 24, no.

13, pp. 1–24, 2023, doi: 10.1002/cbic.202300120.
[12] S. Zhong *et al.*, "Machine Learning: New Ideas and Tools in Environmental Science and Engineering," *Environ. Sci. Technol.*, vol. 55, no. 19, pp. 12741–12754, Oct. 2021, doi: 10.1021/acs.est.1c01339.
[13] D. Mandler, R. Mamlok-Naaman, R. Blonder, M. Yayon, and A. Hofstein, "High-school chemistry teaching through environmentally oriented curricula," *Chem. Educ. Res. Pr.*, vol. 13, no. 2, pp. 80–92, 2012, doi: 10.1039/C1RP90071D.
[14] E. S. Beach, Z. Cui, and P. T. Anastas, "Green Chemistry: A design framework for sustainability," *Energy Environ. Sci.*, vol. 2, no. 10, p. 1038, 2009, doi: 10.1039/b904997p.
[15] A. T. Najafabadi, "CO 2 chemical conversion to useful products: An engineering insight to the latest advances toward sustainability," *Int. J. Energy Res.*, vol. 37, no. 6, pp. 485–499, May 2013, doi: 10.1002/er.3021.
[16] J. Martínez, J. F. Cortés, and R. Miranda, "Green Chemistry Metrics, A Review," *Processes*, vol. 10, no. 7, p. 1274, Jun. 2022, doi: 10.3390/pr10071274.
[17] C. C. Seah *et al.*, "Co-pyrolysis of biomass and plastic: Circularity of wastes and comprehensive review of synergistic mechanism," *Results Eng.*, vol. 17, p. 100989, Mar. 2023, doi: 10.1016/j.rineng.2023.100989.
[18] R. Silva, C. Farias, and I. Mesquita, "Cooperative Learning Contribution to Student Social Learning and Active Role in the Class," *Sustainability*, vol. 13, no. 15, p. 8644, Aug. 2021, doi: 10.3390/su13158644.
[19] J. Colomer, D. Cañabate, B. Stanikūnienė, and R. Bubnys, "Formulating Modes of Cooperative Leaning for Education for Sustainable Development," *Sustainability*, vol. 13, no. 6, p. 3465, Mar. 2021, doi: 10.3390/su13063465.
[20] S. Narulita and S. Armadi, "Improving writing ability through cooperative integrated reading and composition (circ)," *LOA J. Ketatabahasaan dan Kesusastraan*, vol. 18, no. 1, Jun. 2023, doi: 10.26499/loa.v18i1.6022.
[21] N. Nurainun and S. Nasution, "The Influence of the CIRC Learning Model (Cooperative, Integrated, Reading, and Composition) on the Reading Skills Students at Islamic Elementary School," *Scaffolding J. Pendidik. Islam dan Multikulturalisme*, vol. 6, no. 2, pp. 38–57, Jul. 2024, doi: 10.37680/scaffolding.v6i2.5172.
[22] Z. P. Putri, N. Hermita, and E. A. Mulyani, "Enhancing Reading Comprehension in Fourth Graders: Evaluating the Impact of the Cooperative Integrated Reading Composition (CIRC) Model," *AL-ISHLAH J. Pendidik.*, vol. 17, no. 2, Jun. 2025, doi: 10.35445/alishlah.v17i2.5406.
[23] J. Patty, "Enhancing Reading Comprehension through the Cooperative Integrated Reading and Composition (CIRC) Strategy," *Enhancing Read. Compr. through…*, vol. 3, no. 4, pp. 362–377, 2023.
[24] M. Haturrahma, K. Salija, and G. Sakkir, "The Implementation of Cooperative Integrated Reading and Composition (CIRC) Strategy in Teaching Students Writing Skill at Junior High School," *Celeb. J. Lang. Stud.*, vol. 3, no. 2, pp. 219–228, Nov. 2023, doi: 10.51629/cjls.v3i2.147.
[25] E. A. Dare, K. Keratithamkul, B. M. Hiwatig, and F. Li, "Beyond Content: The Role of STEM Disciplines, Real-World Problems, 21st Century Skills, and STEM Careers within Science Teachers' Conceptions of Integrated STEM Education," *Educ. Sci.*, vol. 11, no. 11, p. 737, Nov. 2021, doi: 10.3390/educsci11110737.
[26] A. M. Hasanein and A. E. E. Sobaih, "Drivers and Consequences of ChatGPT Use in Higher Education: Key Stakeholder Perspectives," *Eur. J. Investig. Heal. Psychol. Educ.*, vol. 13, no. 11, pp. 2599–2614, Nov. 2023, doi: 10.3390/ejihpe13110181.
[27] D. Arwen and S. Haq, "THE EFFECT OF COOPERATIVE INTEGRATED READING AND COMPOSITION LEARNING METHOD TOWARDS FABLE WRITING SKILLS," *English Rev. J. English Educ.*, vol. 10, no. 1, pp. 323–336, Mar. 2022, doi: 10.25134/erjee.v10i1.5721.
[28] M. S. Shobirin and M. Wafiroh, "Application of The Circ Learning Model to Improve Student's Reading and Writing Skills in The Yellow Kitab Subject," *Sch. Soc. Lit. Study Educ.*, vol. 1, no. 2, pp. 84–87, Sep. 2021, doi: 10.32764/schoolar.v1i2.1464.
[29] M. Nasution, "The Effect of CIRC (Cooperative, Integrated, Reading and Composition) Method on Students Achievement in Reading Recount Text," *Edunesia J. Ilm. Pendidik.*, vol. 3, no. 2, pp. 136–148, Feb. 2022, doi: 10.51276/edu.v3i2.235.
[30] R. F. Dewinna, "Analysis of the Use of the Cooperative Integrated Reading and Composition (CIRC) Method in Improving Elementary School Students' English Reading and Writing Skills," *Int. J. Curric. Dev. Teach. Learn. Innov.*, vol. 3, no. 2, pp. 69–79, Mar. 2025, doi: 10.35335/curriculum.v3i2.215.
[31] F. Aryani and D. Andrianto, "Enhancing The Fifth Aspect's of Writing By Cooperative Integrated Reading And Composition (CIRC)," *Symfonia J. Pendidik. Agama Islam*, vol. 4, no. 1, pp. 1–18, Jun. 2024, doi: 10.53649/symfonia.v4i1.83.
[32] Yusnidar, I. Mauliana, N. Ulfa, and A. Fitria, "Improving Student Learning Outcomes with the Problem Based Learning Model: Classroom Action Research at the State Islamic Primary School," *Indones. J. Educ. Soc. Humanit.*, vol. 1, no. 2, pp. 1–8, Jun. 2024, doi: 10.62945/ijesh.v1i2.62.
[33] W. Lestari and A. Widayati, "Implementation of Teams Games Tournament to Improve Student's Learning Activity and Learning Outcome: Classroom Action Research," *AL-ISHLAH J. Pendidik.*, vol. 14, no. 4, pp. 5587–5598, Sep. 2022, doi: 10.35445/alishlah.v14i4.1329.
[34] R. M. Putra, S. Solekhah, D. D. Agustina, and B. Sobirov, "Action Learning Strategy to Enhance Students Speaking Skill: A Classroom Action Research," *Anglophile J.*, vol. 2, no. 1, p. 37, Jan. 2022, doi: 10.51278/anglophile.v2i1.269.
[35] M. Nazari, "Plan, Act, Observe, Reflect, Identity: Exploring Teacher Identity Construction across the Stages of Action Research," *RELC J.*, vol. 53, no. 3, pp. 672–685, Dec. 2022, doi: 10.1177/0033688220972456.
[36] S. Wahyu, F. Rizal, and N. Syah, "Teacher Performance Analysis in the Learning Process," *J. Educ. Res. Eval.*, vol. 5, no. 1, p. 67, Jan. 2021, doi: 10.23887/jere.v5i1.30758.
[37] A. Bazan-Ramirez, N. M. Velarde-Corrales, M. E. Rodriguez-Perez, J. Guerrero-Barrios, and R. B. Anaya-Gonzalez, "Observational Record and Self-Report of Teacher-Student Performance in High School Lessons," *Int. J. Educ. Methodol.*, vol. 8, no. 3, pp. 479–491, 2022, doi: 10.12973/ijem.8.3.479.
[38] I. Apriyanti, Leginem, and S. Rahayu, "Efforts to Improve Student Learning Outcomes through the Problem Based

Learning Model in Islamic Education Learning at SD Negeri 104325 Kampung Manggis," *J. Indones. Prim. Sch.*, vol. 1, no. 2, pp. 61–68, Jun. 2024, doi: 10.62945/jips.v1i2.346.

[39] N. Lestari, M. Winarsih, and D. Kusumawardani, "The Use of Meaningful Learning in Distance Learning," *JTP - J. Teknol. Pendidik.*, vol. 25, no. 1, pp. 42–53, Apr. 2023, doi: 10.21009/jtp.v25i1.33701.

[40] F. Daryanes and I. Sayuti, "Research-based learning in biology courses to train students critical thinking skills: Student's perception," *Biosfer*, vol. 16, no. 1, pp. 124–137, Apr. 2023, doi: 10.21009/biosferjpb.23160.

[41] S. Rahmah and A. H. Lubis, "Problem Posing as a Learning Model to Improve Primary School Students' Mathematics Learning Outcomes in Gayo Lues," *J. Indones. Prim. Sch.*, vol. 1, no. 4, pp. 93–104, Dec. 2024, doi: 10.62945/jips.v1i4.409.

[42] P. Goldberg, J. Schwerter, T. Seidel, K. Müller, and K. Stürmer, "How does learners' behavior attract preservice teachers' attention during teaching?," *Teach. Teach. Educ.*, vol. 97, p. 103213, Jan. 2021, doi: 10.1016/j.tate.2020.103213.

[43] N. R. Moşteanu, "Teaching and Learning Techniques for the Online Environment. How to Maintain Students' Attention and Achieve Learning Outcomes in a Virtual Environment Using New Technology," *Int. J. Innov. Res. Sci. Stud.*, vol. 4, no. 4, pp. 278–290, 2021, doi: 10.53894/ijirss.v4i4.298.

[44] G. Sakkir and M. Haturrahma, "The Challenges in Teaching Writing through Cooperative Integrated Reading and Composition (CIRC) Strategy," *ARRUS J. Soc. Sci. Humanit.*, vol. 3, no. 3, pp. 391–396, Jun. 2023, doi: 10.35877/soshum1971.

[45] B. Chaves-Yuste and C. de-la Peña, "Cooperative Integrated Reading and Composition Model to Improve EFL Reading Comprehension and Foster Inclusive Education," *Int. J. Literacies*, vol. 30, no. 1, pp. 1–18, 2022, doi: 10.18848/2327-0136/CGP/v30i01/1-18.