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THE EFFECT OF THE COOPERATIVE INTEGRATED READING AND COMPOSITION (CIRC) MODEL ON THE CRITICAL THINKING SKILLS OF FOURTH-GRADE ELEMENTARY STUDENTS

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Abstract
The background of this research stems from the importance of mastering critical thinking skills from the elementary school level, especially in the development of science and technology. The purpose of this study is to determine the effect of the Cooperative Integrated Reading and Composition (CIRC) learning model on students' critical thinking skills in IPAS learning for fourth-grade students at SDN Inpres Leu. This study employed a quantitative approach using a quasi-experimental method with a nonequivalent control group design. The research subjects were all 36 fourth-grade students of SDN Inpres Leu, consisting of 18 students in the experimental class and 18 students in the control class. The instrument used was an open-ended test designed to measure students' critical thinking skills. The data analysis technique was carried out through several stages, including prerequisite tests such as normality and homogeneity tests, followed by hypothesis testing using the independent sample t-test. The results of the analysis showed a significance value (2-tailed) of 0.000 < 0.05, indicating that the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted. Thus, there is a significant effect of using the CIRC learning model on improving the critical thinking skills of fourth-grade students. These findings suggest that the implementation of the CIRC learning model can serve as an innovative instructional strategy to enhance the quality of the teaching and learning process, particularly in IPAS learning at the elementary school level.
Keywords: *Learning model; CIRC; Critical thinking*

Abstrak
Latar belakang penelitian ini berangkat dari pentingnya penguasaan keterampilan berpikir kritis sejak sekolah dasar, terutama dalam menghadapi perkembangan ilmu pengetahuan dan teknologi. Tujuan penelitian untuk mengetahui pengaruh model pembelajaran Penelitian ini menggunakan pendekatan kuantitatif dengan metode eksperimen semu (*quasi experimental design*) dalam bentuk *nonequivalent control group design*. Subjek penelitian adalah seluruh siswa kelas IV SDN Inpres Leu yang berjumlah 36 orang, terdiri atas 18 siswa kelas eksperimen dan 18 siswa kelas kontrol. Instrumen yang digunakan berupa tes uraian yang dirancang untuk mengukur keterampilan berpikir kritis siswa. Teknik analisis data dilakukan melalui beberapa tahap, yaitu uji prasyarat analisis yang meliputi uji normalitas dan homogenitas, dilanjutkan dengan uji hipotesis menggunakan *independent sample t-test*. Hasil analisis menunjukkan bahwa nilai signifikansi (2-tailed) sebesar 0,000 < 0,05, sehingga hipotesis nol (H_0) ditolak dan hipotesis alternatif (H_a) diterima. Dengan demikian, terdapat pengaruh signifikan penggunaan model pembelajaran CIRC terhadap peningkatan kemampuan berpikir kritis siswa kelas IV. Temuan ini menunjukkan bahwa penerapan model pembelajaran CIRC dapat dijadikan salah satu strategi pembelajaran inovatif untuk meningkatkan kualitas proses belajar mengajar, khususnya dalam pembelajaran IPAS di sekolah dasar.
Kata Kunci: Model pembelajaran; CIRC; Berpikir kritis

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Introduction

Critical and creative thinking skills are an essential part of the dimensions of the Pancasila Student Profile. These two skills must be possessed by students in order to face the challenges of a rapidly changing era amid the advancement of technology and human development (Imamah et al., 2020; Suryaningsih et al., 2021). In line with the demands of the Industrial Revolution 4.0, which emphasizes 21st-century skills, IPAS learning requires the application of critical thinking skills throughout the learning process. Critical thinking skills are essential competencies that students need to master in order to be competitive at the global level. In addition, this ability plays an important role in shaping attitudes, managing and integrating knowledge, and solving problems. This is highly relevant to IPAS learning, which focuses on addressing issues related to natural and social phenomena (Suryaningsih et al., 2024).

The results of observations and interviews at SDN Inpres Leu, particularly with the fourth-grade teacher, revealed that students' critical thinking skills are still at a low level. This condition is caused by the lack of practice questions that develop critical thinking skills and the limited use of learning media, as teachers rely solely on textbooks. In addition, the learning model applied is less varied, making the learning process feel monotonous and tend to be passive. If this situation continues, it will certainly hinder the achievement of learning objectives. Therefore, it is necessary to implement a more engaging learning model in IPAS subjects to increase students' learning interest and prevent boredom during the learning process. Sustaining students' interest in learning helps them feel comfortable in receiving the material, enabling them to understand the lessons more effectively. Thus, when students have a high interest in learning, they find it easier to engage in the learning process while simultaneously developing their critical thinking skills toward the material being studied.

One of the learning models that can serve as a solution to these problems is the implementation of a cooperative learning model, specifically the Cooperative Integrated Reading and Composition (CIRC) model (Harahap, 2023). CIRC, developed by Stevens, Madden, Slavin, and Farnish, is a part of the Cooperative Learning model. Initially, this model was designed as an integrated approach to teaching reading and writing to elementary school students through comprehensive cooperative activities. However, in its development, CIRC has not only been used in language learning but can also be applied to various other subjects (Rahmi & Marnola, 2020). According to Wahyuni (2023), CIRC is a group-based learning model that encourages students to work collaboratively in solving problems and finding answers to the given questions. From these various definitions, it can be concluded that the Cooperative Integrated Reading and Composition (CIRC) model is a cooperative learning approach that emphasizes students' reading and writing skills through group work, requiring them to be active, interactive, and collaborative with their group members. The core activities of CIRC—such as cooperative text reading, discussing meanings, writing summaries, and providing peer feedback—are highly effective in stimulating critical thinking skills, as they encourage students to analyze information, evaluate arguments, and reflect on discussion outcomes (Facione, 2015; Ennis, 2018).

According to Slavin (2020), the strength of the CIRC model lies in its ability to enhance students' critical thinking skills through discussion activities and written responses to reading texts. Through discussion and group work, students can gain a deeper understanding of the material being studied (Johnson & Johnson, 2020). In addition, group collaboration also contributes to the development of social skills and encourages students to work together in achieving learning objectives (Gillies, 2021). Several previous studies (Nugraha & Susilo,

2022; Suryani et al., 2023; Wibowo, 2022) have shown that the CIRC model can improve students' reading and writing abilities. However, most of these studies have focused on cognitive learning outcomes or basic literacy skills, with limited attention to the effect of the CIRC model on elementary students' critical thinking skills. This gap serves as the focus of the present study — to empirically examine how reading, writing, and collaborative activities within the CIRC model can enhance the critical thinking abilities of fourth-grade students in IPAS learning. The novelty of this research lies in the application of the CIRC model to critical thinking skills, with a focus on learning content that differs from previous studies. In practice, the CIRC model is usually implemented by dividing students into small heterogeneous groups, where they read, discuss the content of the text, and provide responses. This model not only encourages students to be active in reading and writing activities but also fosters a culture of critical thinking in responding to a text. In addition, CIRC aligns with the principles of student-centered learning, which emphasize students' active participation in the learning process (Mistendeni, 2020), while the teacher acts as a facilitator who guides and helps direct students' thinking patterns.

In its implementation, students are guided to explore information, collaborate in groups, and present their ideas both orally and in writing. Through these stages, students are expected to develop their critical thinking skills, which include the abilities to analyze, interpret, evaluate, and reflect. Based on this, the study was conducted to examine how the implementation of the Cooperative Integrated Reading and Composition (CIRC) model can improve the critical thinking skills of fourth-grade students at SDN Inpres Leu. The focus of this research lies in the learning process that emphasizes active student engagement and the development of critical thinking skills in understanding and processing information from reading texts. This method is expected to contribute by providing an innovative approach to elementary education, particularly in developing an effective and enjoyable learning experience.

Based on the above description, the purpose of this study is to determine the effect of implementing the Cooperative Integrated Reading and Composition (CIRC) learning model on the critical thinking skills of fourth-grade students at SDN Inpres Leu.

Research Methods

This study employs a quantitative approach with a quasi-experimental design of the Nonequivalent Control Group type. This design was chosen because the school conditions did not allow for full class randomization. The fourth-grade classes at SDN Inpres Leu already have fixed groupings based on schedules and assigned teachers; therefore, the researcher could not randomly assign students to the experimental and control groups.

The experimental class received treatment through the implementation of the CIRC model, while the control class was taught using the conventional approach commonly employed by the teacher (lecturing and assignments).

The research population included all students at SDN Inpres Leu. The sample was selected using purposive sampling, taking into account the results of the odd-semester exam scores, learning materials, and student characteristics. The sample in this study consisted of 36 fourth-grade students. The experimental and control classes were randomly assigned, with 18 students from class IV/A as the experimental group and 18 students from class IV/B as the control group. This selection was made because the initial critical thinking pre-test showed no significant difference between the two groups, indicating that assigning classes A and B as the experimental and control groups would not affect the results.

The research instrument consisted of an open-ended test on critical thinking skills developed based on indicators adapted from Facione (2015), which include: (1) interpretation, (2) analysis, (3) evaluation, (4) inference, and (5) reflection. The instrument was first tested for validity, reliability, discrimination power, and difficulty level.

The research data were analyzed quantitatively using SPSS version 20. The analysis was carried out through several stages: (1) Normality Test using the Kolmogorov–Smirnov test, (2) Homogeneity Test using Levene's Test, and (3) Hypothesis Testing using the Independent Sample t-Test with a significance level of 0.0.

Results and Discussion

This study was conducted at SDN Inpres Leu during the first semester of the 2025/2026 academic year, from July 7 to September 1, 2025. The implementation of the Cooperative Integrated Reading and Composition (CIRC) model in IPAS learning is considered an effective strategy to enhance both conceptual understanding and students' critical thinking skills. In IPAS learning, students often engage with scientific texts, natural phenomena, and social cases (Suryaningsih et al., 2024). Through the CIRC model, students not only read texts but also discuss the content, summarize the material, and present their understanding in the form of reports or written responses.

The IPAS learning treatment using the CIRC model was carried out through several stages, namely: (1) forming small heterogeneous groups so that students can complement each other's understanding of the IPAS text; (2) providing reading texts or IPAS phenomena, such as topics on changes in the states of matter in everyday life, to be studied collaboratively; (3) conducting group discussions to interpret the content of the reading, construct arguments, and relate them to real-life situations; (4) writing the results of the discussion in the form of a composition or written response, which is then presented or exchanged between groups to obtain feedback; and (5) completing an individual written test as a final evaluation to assess the extent to which students are able to integrate their reading and discussion outcomes into their own writing.

Based on the pretest and posttest data conducted for the experimental and control groups, the results of the descriptive analysis are as follows.

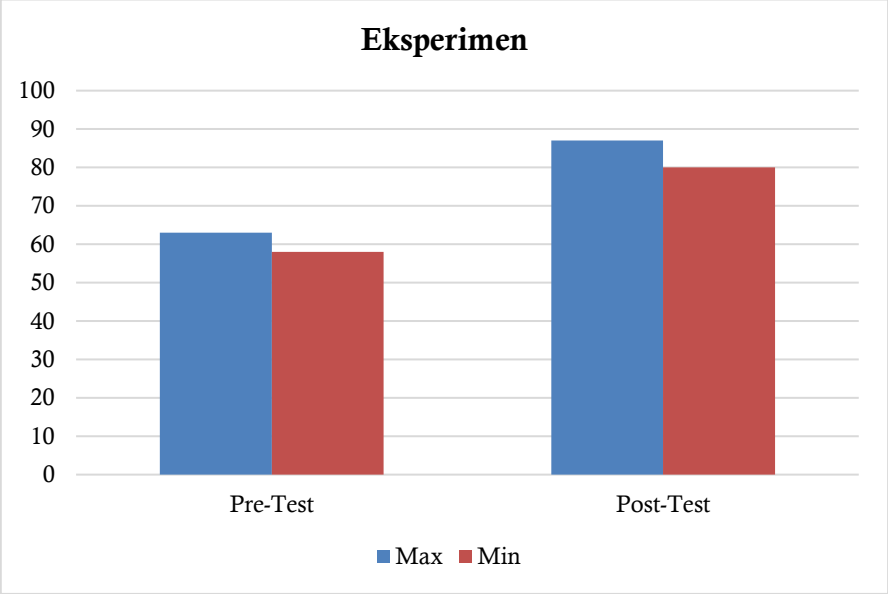

Figure 1. Test Scores of Critical Thinking Skills of Students in the Experimental Class

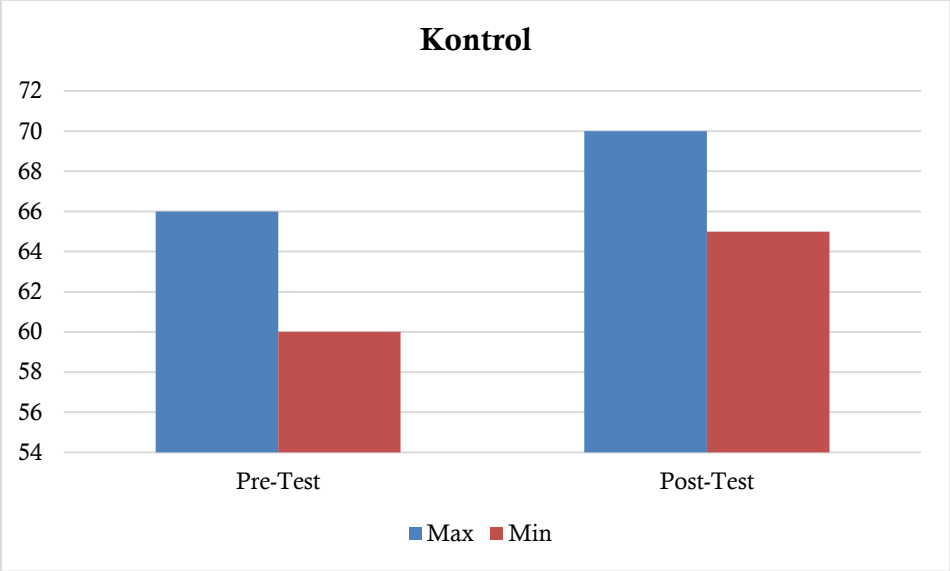

Figure 2. Test Scores of Critical Thinking Skills of Students in the Control Class

The experimental class showed a significant increase from 60.11 to 83.44, indicating that the CIRC model was effective in improving students' critical thinking skills. The control class also showed an increase, but it was relatively small, from 62.50 to 67.61. This occurred because regular learning still provided understanding but was not able to optimally foster higher-order thinking skills. The Cooperative Integrated Reading and Composition (CIRC) model can enhance critical thinking skills, reading comprehension, and learning outcomes as it encourages collaboration, discussion, and text analysis (Nugraha & Susilo, 2022; Suryani et al., 2023).

The CIRC model encourages students to work collaboratively, engage in deep reading, participate in discussions, and write, making them more active in the learning process. The findings of this study support that cooperative-based learning is more effective than conventional methods in improving critical thinking skills, especially at the elementary school level. The significant difference in the post-test results also shows that changes in learning strategies have a substantial impact on students' learning outcomes (Johnson & Johnson, 2019). Before proceeding to hypothesis testing, normality and homogeneity tests were first conducted, with the results presented in Tables 2 and 3 below.

Table 1. Results of the Normality Test for the Experimental and Control Classes

Class		TKBK (Sig)	Decision
Experimental	Pre-test	0,233 > 0,05	Data are normally distributed
	Post-test	0,682 > 0,05	Data are normally distributed
Control	Pre-test	0,204 > 0,05	Data are normally distributed
	Post-test	0,202 > 0,05	Data are normally distributed

In Table 1, the normality test was conducted using the Shapiro-Wilk test with the assistance of SPSS. Based on the normality test results in Table 2, both before and after the treatment with the CIRC model, the students' learning outcome data in the experimental and control classes met the normality assumption. Thus, the requirement for using parametric statistics (i.e., Independent Sample t-test) has been fulfilled. The homogeneity test results can be seen in the following table.

Table 2. Results of the Homogeneity Test of Experimental Class and Control Class Data

Class		TKBK (Sig)	Decision
Experimental	Pre-test	0,233 > 0,05	Homogeeosus Data
	Post-test	0,396 > 0,05	Homogeeosus Data
Control	Pre-test	0,214 > 0,05	Homogeeosus Data
	Post-test	0,398 > 0,05	Homogeeosus Data

Based on Table 2, it can be seen that both the experimental and control groups have homogeneous data variances. This indicates that the pre-test results of students' critical thinking skills in both the experimental and control classes are homogeneous. Therefore, the differences in students' critical thinking skills that emerge are not caused by unequal variances between the groups, but purely due to the different treatments (CIRC model vs. conventional method).

With normality and homogeneity assumptions fulfilled, the use of the parametric Independent Sample t-test is appropriate for testing the research hypothesis. This aligns with the principles of a quasi-experimental design, which require the control of external variables so that the treatment effects can be accurately interpreted (Creswell & Creswell, 2018)

Next, an Independent Sample t-test was conducted to determine the effect of implementing the CIRC model on the critical thinking skills of fourth-grade students at SD Inpres Leu. The following table presents the results of the Independent Sample t-test.

Table 3. Independent Sample T-Test Results

TKBK (Sig)	Decision
0,000 > 0,05	H_0 Rejected (There is an Effect)

Based on table 3, it can be seen that the significance value is less than 0.05, indicating that the implementation of the CIRC model has an effect on the critical thinking skills of fourth-grade students in IPAS subjects at SD Inpres Leu.

The CIRC model is part of cooperative learning that focuses on the integration of reading, writing, discussion, and analytical thinking skills (Dewina, 2025). In practice, students are divided into heterogeneous groups and engage in activities such as: reading together, group discussions, writing summaries or reports, and presenting as well as reflecting. These steps require students' active involvement in understanding the material, processing information, and communicating it back (Haturrahma et al., 2023). Thus, students not only master the content but also develop critical thinking skills through interaction and reflection.

The CIRC model contributes to the critical thinking skills of fourth-grade IPAS students through several aspects: (1) analyzing information, students learn to select important information from texts when studying changes in the states of matter. The CIRC model helps students understand the text more critically and deeply (Ahmad et al., 2023; Putrayasa et al., 2025); (2) evaluating arguments, during discussions, students assess their peers' arguments, compare them with their own knowledge, and draw conclusions, encouraging critical analysis of arguments (Putri et al., 2024); (3) connecting concepts, through writing activities, students are encouraged to relate the concept of changes in the states of matter to everyday experiences, linking the reading to concrete experiences with visuals to strengthen understanding (Ahmad et al., 2023; Wulandari & Wibowo, 2022); and (4) reflective thinking, group reflection and presentations enable students to review their thinking processes, a hallmark of critical thinking. With this consistent practice, students' critical thinking skills significantly improve compared to conventional methods, which tend to be teacher-centered.

Nugraha & Susilo (2022) demonstrated that the CIRC model is capable of improving elementary students' critical thinking skills and reading comprehension because it emphasizes

collaboration and text analysis. It was found that cooperative learning, including CIRC, is effective in enhancing elementary students' critical thinking skills through group discussion activities (Suryani, Prasetyo, & Hartono, 2023). Johnson & Johnson (2019) affirm that cooperative learning provides social learning experiences that foster higher-order thinking skills. Fitriani et al. (2021) emphasize that implementing CIRC in elementary science (IPA) lessons enhances critical thinking skills because students are trained to integrate information from reading texts with group analysis.

The implementation of the CIRC model in IPAS learning for fourth-grade students at SD Inpres Leu has a positive effect on students' critical thinking skills because it actively involves students in reading, discussion, writing, and reflection, habituates them to analyze, evaluate, and connect IPAS concepts with real-life situations, encourages collaboration and the exchange of ideas that enrich thinking perspectives, and has been empirically proven to be more effective than conventional learning

The success of the CIRC model in enhancing critical thinking skills can be explained through its core stages, namely: (1) Reading, students read the text together to understand basic information. This stage stimulates interpretation and analysis skills (Facione, 2015); (2) Discussion, through group discussions, students compare their understanding and present arguments. This stage hones evaluation and inference skills; (3) Composition, students organize the results of the discussion into summaries or reports. This stage fosters reflection and the synthesis of ideas; and (4) Feedback and Reflection, peer feedback and teacher reflection strengthen metacognition and awareness of critical thinking.

The results of this study are consistent with Johnson & Johnson (2019), who assert that cooperative learning enhances higher-order thinking skills through meaningful social interactions. These findings also support the study by Suryani et al. (2023), which found that the implementation of the CIRC model can improve elementary students' critical thinking skills in thematic learning. However, these results differ from the research by Hidayat and Lestari (2021), which found that CIRC was less effective for students with low literacy levels, as they struggled to comprehend reading texts independently. This difference indicates that the success of CIRC is strongly influenced by students' initial literacy readiness and teachers' skills in facilitating group discussions and writing activities.

Future researchers are advised to conduct longitudinal studies over a longer period or to develop a digital-based CIRC model to strengthen literacy and online collaboration aspects.

Conclusion

The results of the study indicate that the implementation of the Cooperative Integrated Reading and Composition (CIRC) learning model has a significant effect on the critical thinking skills of fourth-grade elementary students. The post-test results showed a significant increase in the experimental class compared to the control class, supported by the t-test (Sig. $0.000 < 0.05$). These findings confirm that reading, discussing, writing, and reflecting activities in the CIRC model effectively stimulate students' abilities to analyze, evaluate, and reflect. The study provides a recommendation for teachers to adopt the CIRC model as an innovative strategy in integrated literacy learning. This model not only enhances reading comprehension but also fosters a culture of discussion, reflective thinking, and collaborative writing, aligning with the critical and creative thinking dimensions of the Pancasila Student Profile. However, this study has several limitations, such as a relatively short treatment duration and a limited sample size, so the results cannot be widely generalized. Therefore, future research is recommended to explore the application of the CIRC model in other IPAS materials or to

combine it with digital technology to assess its effectiveness in a broader and more sustainable learning context.

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