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# STORYWEAVER'S INTEGRATED CIRC LEARNING MODEL: AN INNOVATIVE SOLUTION TO IMPROVING READING COMPREHENSION SKILLS IN ELEMENTARY SCHOOLS

**[1]Rissa Alivia Zahra, [2]Nur Latifah**
**[1 2] University of Muhammadiyah Prof. Dr. HAMKA**
[1] raliviazahra@gmail.com, [2] nurlatifah@uhamka.ac.id

## ABSTRACT

Low reading comprehension among elementary students remains a significant educational challenge in Indonesia, often stemming from passive instructional methods and low student engagement levels. At SDN Sukatani 5, many students faced difficulties in reading fluently and understanding texts, mainly due to teacher-centered and individual-based classroom practices. This situation underscores the urgent need for more engaging, student-centered learning strategies to enhance literacy skills. This study investigates the effectiveness of the Cooperative Integrated Reading and Composition (CIRC) model, which is supported by the StoryWeaver digital platform, in enhancing reading comprehension. Adopting a quantitative experimental design, the research involved 60 fourth-grade students, divided into two cohorts. The experimental cohort received the CIRC-StoryWeaver intervention, while the control cohort was taught utilizing traditional methods. Pre- and post-tests were administered, and data were analyzed using descriptive statistics, t-tests, and N-Gain scores. The outcomes revealed a significant improvement in the experimental cohort, by a post-test average score of 84.07 and an N-Gain of 60.97% (moderate effect), compared to the control cohort's score of 79.70 and N-Gain of 49.07% (lower effect). These findings reinforce the relevance of constructivist approaches in literacy instruction and demonstrate the potential of digital tools, such as StoryWeaver, to support active, meaningful, and student-centered learning experiences.

Keywords: Cooperative Integrated Reading and Composition (CIRC), StoryWeaver platform, reading comprehension, digital literacy learning.

## INTRODUCTION

Education stands as a cornerstone of national development, forming the foundation upon which a nation's future is built. It plays a pivotal role in shaping human capital and driving social, economic, and cultural progress. The quality of a country's education system is thus a key indicator of its overall advancement and long-term potential. As Kurniawati (2022) asserts, a nation's development is primarily influenced by the standards, quality, and effectiveness of its education system, which directly impacts human resource development and innovation. In essence, a country's growth can be assessed by the strength of its educational framework, its implementation, and the educational attainment of its population.

In the realm of education, reading and writing are universally recognized as essential foundational skills that every student must develop. These competencies are not only crucial for

academic achievement but also serve as key drivers of personal growth, cognitive development, and effective communication throughout life. As Paynter et al. (2024) emphasize, reading is a core language skill that begins to take shape during the early stages of formal education, particularly in elementary school. It forms the basis for all future learning, enabling students to engage with the world around them, acquire new knowledge, and cultivate critical thinking skills. Improving reading proficiency is, therefore, especially important in early education, where the groundwork for lifelong learning is established. Strong reading skills empower individuals to think analytically, understand complex information, and adapt to the demands of an increasingly digital world. Ultimately, the ability to read well enhances both academic and social opportunities, playing a vital role in shaping a knowledgeable society and advancing national development.

Empirical evidence from the 2022 Programme for International Student Assessment (PISA) underscores the complex nature of literacy challenges in Indonesia. Although the country experienced a rise in its overall ranking, its reading literacy score declined by 12 points compared to the previous assessment period. Nevertheless, this drop was less severe than the global average decline attributed to the COVID-19 pandemic's impact. This suggests a degree of resilience within Indonesia's education system, which managed to weather the crisis more effectively than many other countries. (Kemendikbudristek, 2023). The 2024 Indonesia Education Report further validates this scenario, revealing that 70.62% of elementary school students achieve only basic levels of literacy proficiency, leaving nearly 30% of students requiring educational intervention. Additionally, information from the Computer-Based National Assessment (ANBK), administered by the Ministry of Education and Culture, provides an overview of students' reading literacy capabilities. One of the main components in ANBK is the Minimum Competency Assessment (AKM), which assesses students' reading and numeracy literacy capabilities. The latest ANBK outcomes reveal that many elementary school students in Indonesia still have low reading capabilities, indicating a need for significant improvement.

Early observations at SDN Sukatani 5 revealed numerous issues in teaching the Indonesian language. Many students struggled to read fluently and lacked interest in the subject of reading. Reading was typically done individually, making it challenging for students to read effectively and understand the text. Teachers primarily relied on lectures by minimal interaction

or cohort work. Nevertheless, students enjoyed picture storybooks, indicating that visual aids can enhance the enjoyment and interest in reading.

According to interviews conducted by homeroom teachers at SDN Sukatani 5, students exhibit limited reading abilities and lack enthusiasm for reading. This difficulty hinders their comprehension of lessons and participation in class activities. To address this issue, an engaging and impactful learning approach is required. One effective method is the Cooperative Integrated Reading and Composition (CIRC) model, which combines reading and writing in cohort activities to help students learn together. By letting students work in cohorts through clear steps, this method enables them to enhance their capabilities and learn more effectively as a team. (Chaves-Yuste & de-la Peña, 2022).

Previous studies have extensively examined the effectiveness of the CIRC model. (Jahanbakhsh et al., 2019) Found that CIRC was more effective than the STAD model in improving lexical collocation among EFL learners in Iran. Similarly (Afrizal et al., 2025) Reported that CIRC significantly enhanced reading comprehension capabilities compared to the inquiry-based learning model. This outcome aligns with the outcomes of previous studies conducted on the subject by Nasim et al., (2024), who concluded that CIRC enhances students' overall reading comprehension, comprising creative, critical, and literal comprehension. (Ghasemi & Baradaran, 2018) Also highlighted the benefits of a website-based CIRC approach in integrating reading, writing, and speaking capabilities, which supports the development of EFL learners' speaking abilities. In general, past studies have revealed that the CIRC method helps enhance reading and writing capabilities in elementary school students across various schools.

However, most past studies have rarely employed the CIRC method in conjunction with child-friendly digital equipment, such as StoryWeaver, especially in Indonesia. The utilization of technology in learning has been shown to help students stay interested, motivated, and remember information better. StoryWeaver is an interactive reading platform that supports both visual and auditory learning styles. It also allows teachers to adjust reading materials to suit students' needs and levels. This presents an opportunity to develop a learning method that is more appropriate, meaningful, and student-centered.

This study aims to evaluate the effectiveness of the CIRC method, when supported by StoryWeaver, in enhancing reading skills among fourth-grade students. It examines students'

initial abilities, evaluates the effectiveness of the combined process, and aims to address the gap in teaching approaches that do not incorporate digital, interactive, and real-world learning. By combining cohort learning with a digital platform, this study addresses the requirements of contemporary education, which emphasizes enjoyable, practical, and technology-driven learning. This method is anticipated to be influential for critical thinking, engaging for students, and adaptable for implementation in numerous primary schools.

## LITERATURE REVIEW

### Reading Comprehension

Reading is a challenging activity that requires various skills. To learn from a text, an individual must comprehend, visualize, analyze, and retain the information. Reading is a crucial aspect of language acquisition and knowledge acquisition, impacting various aspects of life. Reading is not solely about recognizing letters and words; it also entails critical thinking, understanding the significance of what is read, evaluating information, and connecting ideas (Harianto, 2020).

Reading comprehension is a highly crucial skill in early education. It helps students acquire information and new knowledge. It involves the ability to understand, analyze, and articulate the content of a text. According to Zan (2019)Reading comprehension is a crucial skill for students to master, as it forms the foundation for acquiring further knowledge and information.

Comprehending a text means understanding what it says and employing critical thinking skills that help make sense of it. According to Alpian Sarah & Yatri (2022)Reading comprehension is the process by which individuals understand, interpret, and internalize the values and norms conveyed in a text. This capability provides a crucial framework for helping students succeed in school and supports their learning at every stage of their education.

### Integrated Reading and Composition Cooperative Learning Model (CIRC)

The Cooperative Integrated Reading and Composition (CIRC) learning model integrates reading and writing activities within small, cohesive groups. CIRC combines direct instruction in reading comprehension with language writing capabilities to create a cohesive learning experience. In this model, each student is accountable for their cohort tasks and collaborates with peers to support one another in developing reading comprehension. The

primary goal of CIRC is to assist students, especially those in upper primary grades, in gaining a more profound comprehension of reading while enhancing their writing capabilities through teamwork (Basri, 2024).

**StoryWeaver as a Media to Support Literacy**

StoryWeaver is an innovative platform that provides hands-on tools for developing, adapting, and translating children's stories into their native languages. (Azad & Chakravarty, 2022). Educators, parents, content creators, translators, and artists collaborate on this platform to create new stories for children and promote reading habits.

StoryWeaver offers a variety of features to enhance children's literacy. Its core offerings include access to engaging stories in multiple languages and themes, such as mathematics, science, and history, designed to enhance children's reading capabilities and expand their knowledge. Users can download stories in PDF (A4) format for printing or in ePub format for digital reading at any time. The platform also supports offline reading via downloadable libraries.

StoryWeaver also allows users to create their own stories using many free pictures. It features simple tools to help translate stories into different languages. All the materials on the site are free to use, share, and modify because they are under a Creative Commons 4.0 license, which means there are no copyright restrictions.

## METODOLOGY

This study took place at SDN Sukatani 5 for the second semester of the 2024/2025 school year, from February to March 2025. The study involved 66 fourth-grade students. In this cohort, 60 students were selected as the sample utilizing purposive sampling, meaning they were chosen based on specific criteria that aligned with the research goals. The students were divided into two cohorts. The first cohort, referred to as the experimental cohort, consisted of 30 students in class IV-A. They were taught utilizing the CIRC method, combined with the StoryWeaver digital platform. The second cohort, referred to as the control cohort, consisted of 30 students in class IV-B. They learned Indonesian utilizing traditional methods, such as lectures and independent reading.

This study employs a quantitative approach through a quasi-experimental design, specifically a non-equivalent control cohort design (Sugiyono, 2017). This design enables

comparison between the experimental and control cohorts, despite not being randomly selected, as they are drawn to be similar due to sharing specific characteristics.

The information was gathered in five main steps. First, in the preparation step, the CIRC learning model was developed and integrated by StoryWeaver. During this phase, the research equipment was inspected and approved by experts, and students were assigned to either the experimental cohort or the control cohort. Secondly, a pretest was administered to see the students' initial reading proficiency. The pretest comprised ten descriptive questions derived from validated indicators of reading comprehension (Harianto, 2020). The third step involved implementing the learning program over four weeks, consisting of a total of eight sessions. The fourth step was to administer a posttest to both cohorts to assess whether their reading comprehension had improved. In the last step, the information was analyzed utilizing SPSS version 32. This included a normality test (Shapiro-Wilk), a homogeneity of variance test (Levene's test), and a hypothesis test using an independent t-test.

The effectiveness of the program was also assessed using the N-Gain formula to determine the extent of students' improvement. All aspects of the research adhered to the ethical guidelines in education. The school formally approved the study, and both students and their parents provided consent to participate. This helped ensure the outcomes were accurate and reliable.

The information was studied step by step to see how well the CIRC model by StoryWeaver helped enhance students' reading capabilities. The initial step involved verifying the validity and reliability of the reading test. According to Cooper and Schindler (in Zulganef, 2006), validity refers to the extent to which an instrument accurately measures the intended variable. Sijintak & Sugiarto (2006) explain that reliability relates to the consistency of an instrument in generating stable and dependable outcomes. This study utilized a quantitative experimental design with a pretest-posttest control cohort.

Validity testing was conducted using the product-moment formula to ensure that the research instrument could accurately measure according to the measurement objectives.

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{\{n \sum X^2 - (\sum X)^2\}\{n \sum Y^2 - (\sum Y)^2\}}}$$

After validity testing, the next step was to measure instrument reliability using Cronbach's Alpha formula to assess the instrument's consistency.

$$r_{11} = \left(\frac{n}{(n-1)}\right)\left(1 - \frac{\sum\sigma_i^2}{\sigma_t^2}\right)$$

The normality test was conducted using the Lilliefors test, following these steps. Calculate the Z-score for each data point:

$$\text{Zi} = \frac{Xi - x}{S}$$

The homogeneity test used Fisher's F-test to compare variances.

$$\boldsymbol{F_{calculated}} = \frac{\boldsymbol{S^2_{largest}}}{\boldsymbol{S^2_{smallest}}}$$

Variance is calculated as:

$$\text{St} = \frac{n(\sum fx^2) - (\sum fx)^2}{n\,(n-1)}$$

For hypothesis testing, an independent t-test was used.

$$t = \frac{\bar{x}1 - \bar{x}2}{Sgab\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where the pooled standard deviation is :

$$Spooled = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

To measure the effectiveness of the intervention, the N-Gain formula was used:

$$N - Gain = \frac{Posttest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}$$

## RESULTS AND DISCUSSION

### Results

### Descriptive Analysis of Students' Reading Comprehension Utilizing CIRC and StoryWeaver

This descriptive analysis provides an overview of students' reading comprehension levels based on pretest and posttest outcomes by the experimental and control cohorts. It aims to compare the reading comprehension skills of students who received the intervention with those who did not. A detailed breakdown is presented in the following table:

Table 3. 1 Description of Statistics between the Control Class and the Experimental Class

| | N | Min | Max | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Experiment Prates | 30 | 46 | 78 | 59.53 | 8.063 |
| Post-Test Experiments | 30 | 70 | 94 | 84.07 | 6.000 |
| Control Pretest | 30 | 42 | 72 | 55.07 | 8.246 |
| Post-test control | 30 | 60 | 88 | 78.67 | 6.266 |
| Valid N (in the direction of the list) | 30 | | | | |

The outcomes presented in Table 3.1 reveal that both the experimental and control cohorts showed improvements in their average scores following the intervention. The experimental cohort, which utilized the CIRC model supported by the StoryWeaver platform, increased its average score by 59.53 on the pretest to 84.07 on the posttest. Additionally, the standard deviation decreased by 8.063 to 6.000, indicating that the students' progress became more consistent. Similarly, the control cohort, which received traditional instruction, also demonstrated improvement, with average scores rising by 55.07 to 78.67. The standard deviation in this cohort also decreased, from 8.246 to 6.266, suggesting a more uniform level of progress among its members. These findings suggest that the integration of the CIRC model by the StoryWeaver platform not only enhances students' reading comprehension but also promotes more equitable learning outcomes across the cohort.

**Normality Test for Reading Comprehension Assessment**

To ensure the validity and reliability of the statistical analysis, a normality test was performed utilizing the Shapiro-Wilk method. This test was deemed appropriate, as each cohort comprised 30 students, which is well within the recommended sample size for its application.

Table 3. 2 Normality Test

| | Class | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistics | Df | Sig. | Statistics | Df | Sig. |
| outcome | Experimental Class Prices | .103 | 30 | .200* | .967 | 30 | .449 |
| | Post-Test Experiment Class | .165 | 30 | .036 | .949 | 30 | .163 |
| | Control Class Pretester | .092 | 30 | .200 | .965 | 30 | .416 |
| | Posttest Control Class | .102 | 30 | .200* | .946 | 30 | .129 |

*. This is the lower limit of true significance.

a. Correction of Lilliefors' Significance

Based on the SPSS analysis revealed in Table 3.2, the pretest and posttest information by both the experimental and control cohorts were normally distributed, as all significance values were above 0.05. This means the scores were consistently spread out, devoid of any significant outliers, helping to ensure the accuracy and reliability of the next steps in the statistical analysis. Ensuring the normality of information is crucial in educational research, as variations in learning styles and external factors could otherwise distort the interpretation of outcomes.

**Homogeneity Assessment of Reading Comprehension Skills**

Verifying the standard of variances among cohorts is crucial in ensuring the validity of a quasi-experimental design. This study conducted a homogeneity test utilizing Levene's Test for the Standard of Variances to assess if the experimental and control cohorts had equal variances based on their posttest scores.

Table 3. 3 Control and Experimental Class Homogeneity Test

| | Live Statistics | df1 | DF2 | Sig. |
|---|---|---|---|---|
| Based on Average | .039 | 1 | 58 | .844 |
| By Median | .040 | 1 | 58 | .841 |
| Based on Median and by adjusted df | 0.40 | 1 | 57.865 | .841 |
| Based on the trimmed average | .033 | 1 | 58 | .856 |

The information in Table 3.3 reveals a significance value of 0.844 ($p > 0.05$) based on the mean, suggesting no significant difference in variance among the experimental and control cohorts. This confirms that the information is homogeneous. In essence, the spread of values among the two cohorts is similar, meeting the assumption of homogeneity of variance. This similarity in variance is crucial because it supports the idea that any differences in posttest scores among the two cohorts are more likely the outcome of the learning treatment—specifically, the CIRC model supported by StoryWeaver—rather than differences in the cohorts' initial characteristics.

**T-Test Analysis Between Groups**

The Independent Samples T-Test is a widely used inferential statistical method in quasi-experimental research, particularly for comparing two cohorts that receive different treatments but share similar baseline characteristics. In this study, the t-test was used to compare the

posttest scores of two independent cohorts—the experimental and control cohorts—to determine if the differences in outcomes were statistically significant.

Table 3. 4 Independent Sample T-Test

| Value | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | Df | Significance | | Mean Diff | Std. Error Diff | 95% Confidence Interval of the Difference | |
| | | | | | | One Sided p | Two Sided p | | | Lower | Upper |
| | Equal variances assumed | .039 | .844 | 3.409 | 58 | <.001 | .001 | 5.400 | 1.584 | 2.230 | 8.570 |
| | Equal variances not assumed | | | 3.409 | 57.891 | <.001 | .001 | 5.400 | 1.584 | 2.229 | 8.571 |

Based on the outcomes of the t-test presented in Table 3.4, the value of the two-sided significance is < 0.001, which is substantially smaller than the critical threshold of 0.05. This reveals a statistically significant difference in posttest scores between the experimental and control cohorts. The mean difference was 5.400 points, with a 95% confidence interval ranging from 2.229 to 8.571. These outcomes reveal that the implementation of the Cooperative Integrated Reading and Composition (CIRC) model, supported by the StoryWeaver platform, has a positive impact on students' reading comprehension compared to traditional teaching methods. From a pedagogical standpoint, this finding suggests that the CIRC approach not only improves academic performance but also promotes more equitable learning outcomes among students. Additionally, the relatively small standard error of 1.584 reinforces the reliability and consistency of the outcomes.

**Analysis of N-Gain Scores in Reading Comprehension**

The effectiveness of the learning program was evaluated by comparing students' pretest and posttest scores, as well as by calculating the N-Gain scores to assess the extent of improvement. The N-Gain scores served as a valuable metric for measuring the degree to which students' reading comprehension improved following instruction utilizing the CIRC model supported by the StoryWeaver digital platform.

Table 3. 5 N-Gain Test

| | | Mean | Min | Max |
|---|---|---|---|---|
| N-Gain Percent | Experimental Classes | 59.6309 | 27.78 | 86.96 |
| | Control Class | 51.5009 | 25.93 | 79.31 |

Table 3. 6 N-Gain Interpretation Categories

| Present (%) | Interpretation |
|---|---|
| <40 | Effective |
| 40-55 | Less Effective |
| 56-75 | Quite effective |
| >76 | Effective |

Source: Hake, R.R, 1999

Based on the analysis outcomes, the experimental cohort achieved an average N-Gain score of 59.63%, classified as "moderately effective." (Hake, 1999), while the control cohort scored lower at 51.50%, indicating "less influential" outcomes. The experimental cohort demonstrated more consistent improvement, with N-Gain scores ranging from 27.78% to 86.96%. In contrast, the control cohort showed a broader and less stable range, by 25.93% to 79.32%. These findings suggest that the implementation of the CIRC model supported by StoryWeaver is more effective in enhancing students' reading comprehension.

## DISCUSSION

Various factors, such as student interest, learning materials, and teaching methods, significantly influence the effectiveness of student learning (Amrizal, 2022). Among the four language skills, reading comprehension holds particular importance for language acquisition and academic achievement, as it involves the ability to understand, interpret, and derive meaning from written texts (Harianto, 2020). Despite its significance, many elementary students continue to face difficulties in reading comprehension, often due to low motivation and conventional teaching methods that do not effectively engage them. To overcome these challenges, the Cooperative Integrated Reading and Composition (CIRC) model offers a practical solution by engaging students in collaborative reading, discussion, and writing activities related to the text. This active learning approach fosters more profound understanding and increases student engagement.

The findings of this study demonstrate the significant benefits of implementing the CIRC model, aided by StoryWeaver as a digital reading tool. The experimental cohort's reading scores improved markedly, from 59.53 to 84.07, while the control cohort also improved, albeit to a lesser extent, from 55.07 to 78.67. An independent t-test confirmed that the difference between the two cohorts was statistically significant ($p < 0.001$). Furthermore, the N-Gain scores revealed that the experimental cohort achieved a 59.63% improvement, categorized as "moderately influential," whereas the control cohort showed a 51.50% gain, falling under the

"less influential" category. These outcomes provide strong evidence that integrating digital tools into a collaborative learning framework can significantly enhance students' reading comprehension skills.

This instructional model is rooted in constructivist learning theory, which asserts that students learn most effectively through active engagement. According to this perspective, learners construct knowledge by interacting meaningfully with learning materials and collaborating with their peers (Ormrod in Harefa et al., 2024). Inside this framework, teachers serve as facilitators rather than mere transmitters of information, guiding students to think critically and collaborate effectively, thereby fostering meaningful learning experiences (Lay et al., 2025). The use of digital tools such as StoryWeaver aligns closely with constructivist principles, offering rich, visually supported content that encourages active participation and accommodates a variety of learning styles.

The findings of this study support previous research on the effectiveness of the CIRC model in enhancing reading outcomes (Mailani et al., 2024; Nasim et al., 2024; Safitri et al., 2024). Notably, this study contributes new insights by demonstrating that integrating the CIRC approach through child-friendly digital platforms, such as StoryWeaver, enhances its relevance and effectiveness in contemporary educational contexts. The use of technology not only increases student engagement but also expands access to a wide range of age-appropriate and diverse reading materials. Thus, the study highlights that the CIRC model, when supplemented by innovative digital tools such as StoryWeaver, offers a promising and creative approach to enhancing reading comprehension among elementary school students in today's digital learning environment.

## CONSLUSION

This study investigated the effectiveness of the Cooperative Integrated Reading and Composition (CIRC) model, combined with the StoryWeaver digital platform, in enhancing reading skills among fourth-grade students. The outcomes showed that students in the experimental cohort, who were taught utilizing the CIRC model supported by StoryWeaver, experienced substantial improvement. Their average score increased by 59.53 before the intervention to 84.07 afterward. In contrast, the control cohort, which was taught utilizing conventional methods, showed a smaller gain, with scores rising by 55.07 to 78.67. An independent t-test revealed that the difference between the two cohorts was statistically

significant ($p < 0.001$). Additionally, the experimental cohort achieved an N-Gain score of 59.63%, classified as "moderately influential," while the control cohort's score of 51.50% was deemed "less influential." The use of StoryWeaver contributed to improved student engagement and comprehension by providing colorful, age-appropriate reading materials. Furthermore, the CIRC model, grounded in constructivist learning theory, fostered a collaborative and active classroom environment. Overall, the integration of the CIRC approach by StoryWeaver proved to be a powerful and effective method for enhancing reading comprehension among elementary school students.

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