

# Effectiveness of CIRC to Enhance Chinese Reading and Writing Skills for Grad 3 Primary Students in Liuzhou City, China

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Received: September 18, 2023

Accepted: November 20, 2023

Online Published: December 18, 2023

doi:10.5539/jel.v13n1p123

URL: <https://doi.org/10.5539/jel.v13n1p123>

## Abstract

The objective of this study is to investigate the effects of implementing the Collaborative Strategic Reading (CIRC) approach in reading instruction on the development of reading and writing abilities among third-grade children in primary schools. Utilizing a unified pre-test and post-test experimental design. The study's sample consists of 43 students that are enrolled in Class 1 of Grade 3. The study involved the implementation of Collaborative Integrated Reading and Composition (CIRC) methodology in Chinese reading instruction. Additionally, self-designed assessments were administered to measure the students' reading and writing proficiency levels. These assessments were conducted both before to and after the experimental intervention, allowing for the examination of any variations in the students' scores. The data underwent analysis utilizing the Statistical Package for the Social Sciences (SPSS), which involved calculating the mean, standard deviation, and conducting a T-test. The findings of the study suggest that the use of CIRC (Cognitive Instructional Reading Comprehension) in Chinese reading instruction yields a substantial enhancement in the reading and writing proficiencies of elementary school children. Moreover, there is a notable increase in the scores across several dimensions of reading and writing skills. Based on the findings of this study, the researchers propose the implementation of CIRC technology in Chinese reading instruction across several grade levels as a means to augment students' proficiency in reading and writing.

**Keywords:** Cooperative Integrated Reading and Composition, reading skills, writing skills

## 1. Introduction

### 1.1 Theoretical Background

The contemporary era is characterized by the swift advancement of information, science, and technology, resulting in the emergence of a globalized modern information society. The act of reading has evolved into an essential means for individuals to establish channels of connection with the external world. Moreover, the skill of reading will persist alongside individuals throughout their lifetimes, exerting a profound influence on their personal growth and development. Proficiency in reading and writing holds significant importance within the realm of language instruction and application. Writing is widely regarded as the most precise and methodical language proficiency. As an individual's writing skills get more advanced, their general use of language becomes increasingly systematic. Enhancing the reading and writing abilities of kids has consistently posed a formidable task for educators of Chinese language in primary schools. The implementation of Cooperative learning in the domain of elementary education, particularly in the instruction of Chinese reading and writing at the primary level, presents numerous benefits. It allows for the optimal utilization of students' agency, fostering their active engagement in the learning process, and invigorating their motivation to acquire knowledge.

Cooperative learning is a pedagogical approach that assembles a learning group as a cohesive unit, guided by shared objectives, to establish an optimal learning environment. Within this context, group members collaboratively learn from one another, progress collectively, and ultimately attain educational goals. In this framework, teachers assume the roles of facilitators and assessors (Doymus, 2007; Eilks, 2005; Hanze & Berger, 2007; Lin, 2006; Wanglin, 2018; Li, 2019). One of the cooperative learning techniques, Collaborative Integrated Reading and Composition (CIRC), is specifically designed to enhance reading, writing, and other language skills within the primary education grades. The "discovery learning" theory advocated by Bruner emphasizes that students' learning should first be an active process of discovery, rather than a passive and mechanical process of

accepting knowledge. The roles and learning processes played by teachers and students in CIRC teaching are consistent with the discovery learning theory advocated by Bruner.

According to Piaget (1971), it is crucial to facilitate students' transcendence of their initial cognitive frameworks, overcome the constraints imposed by their own experiences, and develop an appreciation for diverse perspectives on shared concepts during the instructional process. The inclusion of cooperation and debate within the learning process has the potential to facilitate a comprehensive understanding of diverse opinions and perspectives among students. The CIRC platform facilitates student engagement in discussions, comprehension, and integration of diverse viewpoints pertaining to a shared subject matter. Enhanced comprehension is achieved through the collaborative efforts of learners. The shared characteristics of constructivist learning theories include an emphasis on initiative, social interaction, and the situational nature of learning, as well as a comprehensive knowledge of the fundamental principles underlying the learning process.

According to Dodge (1976), a prominent proponent of social interdependence theory, cooperative learning theory can be succinctly encapsulated as follows: "When individuals unite in pursuit of a shared objective, they draw upon the potency of collective solidarity." The proposal of CIRC can be attributed to the significant groundwork created by social interdependence theory.

The primary focus of CIRC is the examination of the dynamic interplay between individuals and the influence of emotions and attitudes on the process of learning. The theory of humanistic psychology places significant emphasis on the establishment of a favorable psychological milieu for students, the influential role of interpersonal interactions in the process of learning, and the prioritization of student-centered instructional approaches. These perspectives align with the fundamental principles of cooperative learning.

### *1.2 Related Studies*

Scholars have dedicated their attention to the development of reading and writing skills. According to Graber and Stoller (2007), the development of reading skills can be divided into two distinct stages: the low-level stage, characterized by slower development, which includes word recognition and basic writing skills, and the high-level stage, where individuals can analyze and apply the content of the text, including comprehension of syntax and semantics. Stanvoich et al. (2010) argue that vocabulary comprehension and retention significantly impact reading skill development, particularly in the years preceding third grade. After reaching this milestone, children's vocabulary understanding and mastery of common words can support their reading comprehension.

In the realm of writing, Frauer and Hayes (1981) conducted a comprehensive study of the writing process in the United States, identifying three fundamental processes: conceptualization (organization of ideas), translation (expression of thoughts), and revision. Sukhomlinsky proposed a set of skills that students should acquire in reading and writing training, which includes the ability to transcribe dictated content, compare and contrast various subjects, and observe phenomena in their surroundings. Zhu Zuoren and Li Zhiqiang (1987) contended that writing skills encompass "the most comprehensive learning ability." Wu Zhonghao (2009) further expanded on this notion by categorizing primary school students' writing skills into areas such as information gathering, critical thinking, structural competence, linguistic proficiency, and revision capability. Among younger primary school students, differences in writing skills are particularly noticeable in problem-solving, conceptualization, and precise expression.

Some researchers have explored the impact of Cooperative Learning on Chinese reading skills in primary school settings. For instance, Liang Jing (2016) conducted research in Huaiyang Experimental Primary School and discovered that the advantages of Cooperative Learning were underutilized in current Chinese reading teaching. She proposed specific improvements, highlighting the importance of teacher-led classroom design and active student participation. Ma Leyan (2020) conducted a survey in Weifang and affirmed the value of Cooperative Learning in Chinese reading instruction. These studies offer insights into Chinese reading teaching strategies but lack a comprehensive approach rooted in a systematic reading instruction process.

Sukhomlinsky presented a holistic system for improving students' writing skills (Wei Zhicheng, 2009). Writing instruction in the United States prioritizes practicality, advocating collaborative writing where students share and modify their work and ultimately print their articles. Japan emphasizes practicality in students' compositions as well (Wu, 2010). Schools also emphasize the discussion and exchange of writing skills, with students reading and evaluating each other's work. Dong Beifei (2020) underscores the importance of students' reading habits, the transfer of writing skills from reading, innovative classroom teaching models, and creating a collaborative writing environment to enhance students' writing abilities.

Huang Yueou (2014) explored the feasibility and necessity of fostering student subjectivity through Cooperative

Learning in Chinese reading and writing instruction. Zhou Jinjun (2016) conducted action research to delve into the application of group cooperative learning in Chinese reading and writing teaching, emphasizing the cultivation of students' cooperative abilities and their direct influence on group efficiency. Fan Wenjie's (2018) research reinterpreted reading and writing skills in light of new curriculum standards. Through collaborative learning, students' motivation, interest, and learning outcomes improved, leading to enhanced reading and writing skills in various Chinese language classrooms.

These studies collectively provide valuable insights into the development of reading and writing skills, emphasizing the potential benefits of Cooperative Learning and collaborative teaching approaches in improving students' proficiency in these critical areas.

### *1.3 Context and Question of the Study*

According to the recently released "Chinese Language Curriculum Standards for Compulsory Education" in China, it is explicitly stated that pupils are expected to possess the capacity for autonomous reading and acquire proficiency in employing various reading strategies. The individual demonstrates a substantial acquisition of knowledge and possesses a strong command of language, emphasizing the exploration of emotional encounters and the cultivation of empathy and comprehension. The ability to effectively articulate one's observations, experiences, and thoughts in a precise and coherent manner is a valuable skill that adheres to established linguistic conventions. The ability to effectively employ common expressions and enhance one's written language proficiency as required. This observation highlights the significant significance that the instruction of reading and writing assumes in the Chinese language teaching process. However, the issue of enhancing the efficacy of reading and writing instruction, as well as improving students' reading and writing proficiency, remains unresolved. In China, conventional educational practices place significant emphasis on examination-oriented learning, characterized by a "teacher-centered" approach in the classroom and pedagogical techniques that frequently prioritize rote memory and mechanical skill development. The instructional emphasis is primarily centered on knowledge acquisition, with a particular concentration on pronunciation, written expression, and vocabulary usage. However, this approach presents significant challenges when it comes to fostering students' reading and writing skills. Upon doing a comprehensive analysis of scholarly material published during the last decade, it becomes evident that cooperative learning has demonstrated numerous benefits within the realm of foundational education, particularly in the context of Chinese reading and writing instruction at the primary school level.

The present study opted for a typical primary school located in Liunan District, Liuzhou City. Approximately 50% of the pupils' parents were absent from the household due to employment commitments. The phenomenon of insufficient parental attention to their children's education, which is prevalent in rural primary schools in China, can be attributed to their busy work schedules. A common deficiency among students is a limited proficiency in Chinese reading and writing. In the endeavor of fostering students' reading and writing proficiencies, educators frequently neglect the nurturing of students' own interests. During the reading and writing process, students exhibit a passive disposition, and their level of excitement towards these activities is quite low. In the present situation, there is an urgent need to identify the most efficient and optimal approach to effectively harness students' motivation for learning.

This study focuses on the implementation of CIRC (Computer-Integrated Reading and Writing Curriculum) in the instruction of Chinese reading and writing at the elementary level, specifically targeting lower grades of primary school. The objective of this research is to investigate the efficacy of CIRC technology in enhancing the Chinese reading and writing abilities of primary school students.

### *1.4 Statement of the Problem*

The investigation into cooperative learning encompasses a diverse range of nations, educational levels, and subject areas. These sources offer a comprehensive theoretical framework and serve as a valuable practical resource for the present investigation. However, past empirical studies on cooperative learning have indicated that the implementation of cooperative learning strategies is predominantly observed in the context of middle school education. Insufficient study has been conducted thus far regarding the utilization of CIRC technology in the context of primary school Chinese reading and writing instruction. The actual implementation of CIRC in fostering students' reading and writing abilities continues to face numerous challenges, particularly the dearth of empirical investigations. The purpose of this study is to conduct an experiment on the implementation of the Cognitive Integration Reading Comprehension (CIRC) approach in Chinese reading instruction. The study aims to investigate the underlying mechanisms through which CIRC influences the Chinese reading and writing skills of primary school students. Ultimately, the study seeks to promote the widespread adoption of CIRC technology

in Chinese reading instruction at the primary school level.

### 1.5 Significance of the Study

“Primarily, the adoption of the Collaborative Integrated Reading and Composition (CIRC) strategy within primary school Chinese reading instruction serves as an effective means to foreground students’ subjectivity and stimulate their active participation in the learning process. As the new curriculum reform unfolds, the imperative of cultivating students’ leadership roles in Chinese language classrooms has garnered significant attention among educational theorists. In this context, CIRC emerges as a pragmatic approach to realize this objective.

Secondarily, the CIRC strategy contributes to the gradual development of cooperative sensibilities among students, fostering a continual enhancement of their collaborative abilities. Through participation in group-based learning, students inevitably refine their teamwork skills, concurrently recognizing the inherent value of collaborative efforts. Consequently, a cultivated sense of cooperation becomes an inherent facet of their educational journey.

Ultimately, the application of the CIRC strategy in pedagogy yields tangible benefits by elevating and refining students’ proficiencies in reading and writing. This strategic integration enables the systematic enhancement of these foundational language skills.”

## 2. Method

### 2.1 Study Design

To gather the study’s data, a single-group pre-experimental design was employed, comprising a sequence of one-group pre-test, treatment, and post-test phases aimed at assessing the students’ reading and writing skills. In this design, the group undergoing the intervention received both a pre-test and a post-test. The pre-test was administered to gauge the participants’ baseline proficiency in reading and writing, while the post-test was conducted to evaluate the impact of the treatment. The study’s design is delineated as follows:

Table 1. Experimental mode

| Group | Pre-Test       | Treatment | Post-test      |
|-------|----------------|-----------|----------------|
| N     | O <sub>1</sub> | X         | O <sub>2</sub> |

Note. The experimental treatment is Cooperative Learning with CIRC (X).

O1 refers to a pre-test administered to the experimental group, namely evaluating their reading and writing skills through standardized assessments. O2 serves as a post-test measure for the experimental group, administered subsequent to the completion of the experiment. The experiment employed standardized Chinese reading and writing skills tests of equivalent complexity for both the pre-test and post-test assessments.

### 2.2 Participants of the Study

This research engaged a cohort of 43 third-grade students. The selection of third graders as the study’s focal group was based on several considerations. Firstly, third graders typically possess foundational reading and recognition skills acquired during their earlier years in first and second grade, rendering them capable of engaging with instructional assignments. Secondly, students at this stage of primary education exhibit a comfort level within the school environment and demonstrate a propensity for effective collaboration with their peers. Their cognitive capacities are characterized by deep imaginative thinking, curiosity, and expressive capabilities. Cooperative learning strategies have been recognized for their role in fostering children’s cognitive development, including improved communication, personality development, and the nurturing of their potential. Thirdly, the Chinese language curriculum guidelines for compulsory education in China advocate for the development of students’ reading and writing proficiencies within language instruction. The treatment phase, conducted during the first semester of the 2022–2023 academic year, extended over multiple evenings to achieve the study’s objectives.

### 2.3 Research Instruments

The experimental tool employed in this study is the measurement tool used to assess the dependent variable, which comprises the reading and writing skills test papers. The design of the reading skills test paper is adapted from the reading proficiency test paper developed by Liu Qisheng in 2019, ensuring content validity and alignment with the measurement objectives. Similarly, the design of the writing skills test paper is based on the writing proficiency test paper created by Shibo in 2006, specifically tailored for primary school students in

grades 3–6. To ensure the validity of the measurement tool, two sets of test papers were utilized, one for pre-experimental assessment and another for post-experimental assessment. These test papers, encompassing both reading and writing skills assessments, were combined to evaluate student performance. Rigorous testing procedures were conducted to validate the reliability and effectiveness of these assessment tools in measuring the targeted skills.

#### 2.4 Statistical Analysis

The data collected from the pre- and post-experience assessments were analyzed using the Statistical Package for the Social Sciences (SPSS) software application. The data acquired from reading skills and writing skills tests were subjected to analysis using ANOVA technology in order to determine whether a statistically significant difference existed. The student's findings were subjected to analysis at a significant level of  $\alpha = 0.05$ .

#### 2.5 Data Collection

In this study, the experimental processing (CIRC teaching process) was mainly based on the research results of Recording to Kessler in Ristanto et al. (2018) and improved on this basis, as shown in Figure 1. The details are as follows:

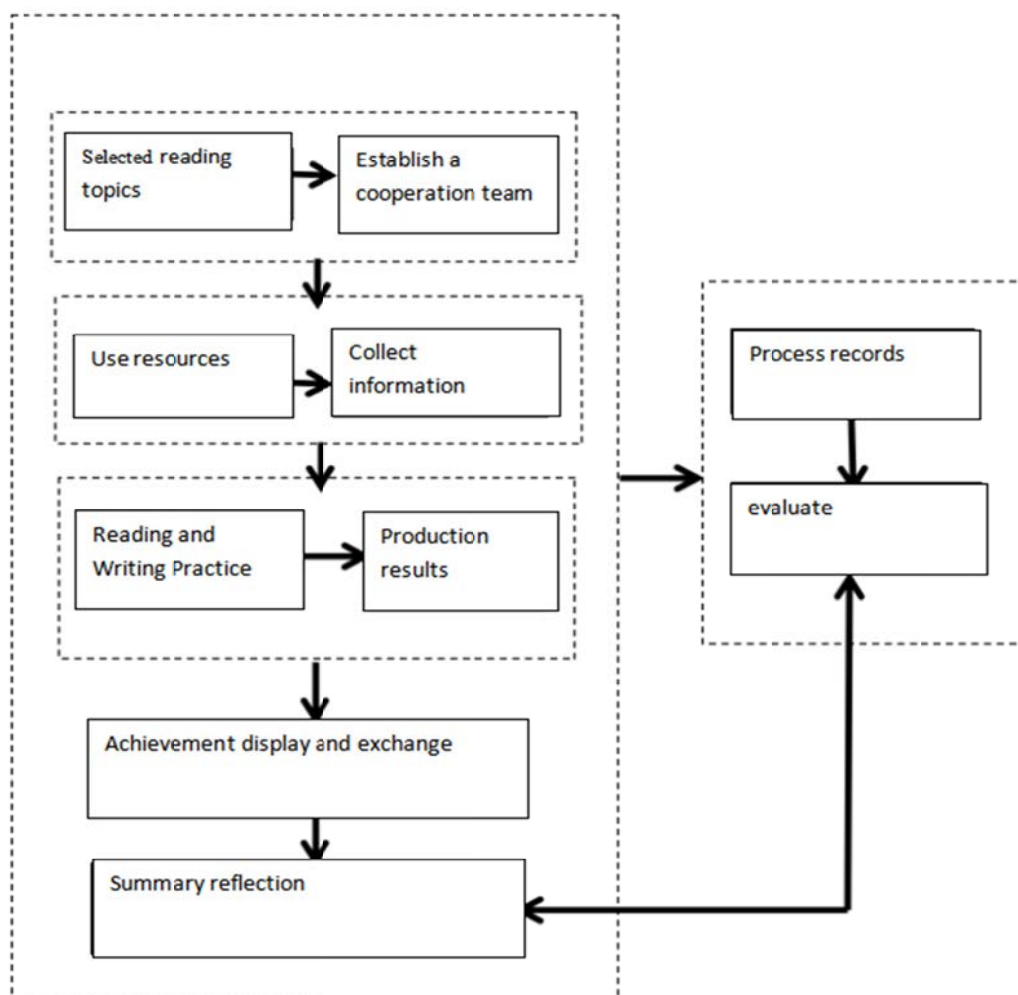


Figure 1. Design flow chart of Cooperative Learning with CIRC

The initial stage of the CIRC start-up process. During the initial week of the trial, the instructor implemented the Collaborative Interactive Reading Comprehension (CIRC) exercise within the context of the Chinese reading lesson. The instructor initially employed movies as a means to disseminate information about CIRC learning to

the students in the experimental class. Subsequently, the designation of group leaders was made in accordance with the pre-established group divisions, with the primary responsibility of facilitating diverse cooperative learning tasks during the reading activity. Subsequently, it is vital to elucidate the allocation of tasks within the collective and effectively harness the fervor of team constituents to actively engage in the acquisition of knowledge pertaining to CIRC. Role rotation can be employed by educators as a means to elucidate the allocation of tasks within a group. To promote group cohesion, educators facilitate team activities, facilitate the creation of group names, slogans, and development objectives, and foster a sense of belonging among group members.

The particular phase of implementation in the context of the CIRC framework. From the second week of the experiment onwards, in accordance with the prescribed procedures for applying the CIRC technology, it is imperative to meticulously choose the Chinese reading theme and thereafter execute a weekly topic for the purpose of conducting the CIRC. Initially, the experimental instructor judiciously formulates collaborative assignments that align with the demands of reading and writing. (1) Develop instructional activities that are centered around the fundamental and challenging aspects of reading and writing instruction. (2) Develop learning activities centered around the uncertainties in the field of reading instruction. It is inevitable that students will meet challenges in the process of reading, leading to disturbances in their cognitive equilibrium. Engaging in problem-solving activities can facilitate the enhancement of students' cognitive capabilities. Additionally, it is important to foster students' intrinsic motivation for reading and cultivate their enthusiasm to engage in Collaborative Information Retrieval and Comprehension (CIRC). In addition to developing collaborative reading and writing assignments, educators should also consider the mobilization of students' emotions, the enhancement of their motivation to engage in Collaborative Interactive Reading and Writing (CIRC), and the facilitation of active cooperative motivation through emotional engagement. Once again, the objective of optimizing the evaluation technique of Cooperative Integrated Reading and Composition (CIRC) is to align it with the primary goal of enhancing student cooperative learning outcomes. This optimization aims to enhance the effectiveness of classroom instruction and facilitate students' acquisition of a broader range of knowledge. The evaluation table developed by the research center encompasses various aspects, such as students' inclination to engage in CIRC, allocation of tasks, fostering of cooperative spirit, communication dynamics, overall sentiments, and more. The assessment techniques encompass self-evaluation, peer evaluation, and instructor evaluation. CIRC technology places significant emphasis on the integration of reading and writing. By employing reading as a teaching tool, it aims to foster students' transferability, enabling them to effectively apply the acquired mastery of eloquent vocabulary, sentence structures, and writing skills to their own writing endeavors. Hence, during the subsequent weeks of the experiment, it is intriguing to enhance the proficiency of each group by having them rework ideas or compositions centered around the theme of the reading material.

The step of summarization and presentation inside the Contextual Information Retrieval and Classification (CIRC) framework. During this phase, a single representative is chosen at random from each group to deliver a report to the entire class on behalf of their respective group. The report encompasses the accomplishments of the group subsequent to the introduction of the CIRC, identifies areas that require additional endeavors, and assigns scores to the other groups in relation to the speaking group. The teacher conducts a comprehensive assessment of each group's performance following their participation in the experiment, and subsequently identifies the top three performing groups.

### **3. Results**

#### *3.1 Comparative Analysis of the Pre-Post Test Results of the Chinese Reading Skills Test in the Experimental Class*

The cumulative score for both the pre-test and post-test assessments of reading skills amounts to 40 points. The mean score of the experimental class in the pre-test is 31.01, with a standard deviation of 6.18. The post-test yielded an average score of 33.62, accompanied by a standard deviation of 3.19. To enhance the analysis of the experimental findings, the present study employed SPSS 22.0 software. The present study employed the program SPSS 22.0 to conduct a normal distribution test on the before and post test results, as well as a paired sample T-test. The findings are presented in Tables 2 and 3.

Table 2. Pre-test and Post-test Normal distribution (Reading skills)

|           | Kolmogorov-Smirnov <sup>a</sup> |    |       |
|-----------|---------------------------------|----|-------|
|           | Statistical data                | df | Sig   |
| Pre-test  | 0.125                           | 43 | 0.088 |
| Post test | 0.182                           | 43 | 0.093 |

The data presented in Table 2 indicate that both the pretest and posttest datasets exhibited a normal distribution. As a result, parametric statistical methods were employed for the analysis.

Table 3. Paired sample t-test for pre- post test Reading skill scores in experimental classes

|        | Pre-test scores | post-test scores | <i>t</i> | Degree | Significance ( <i>p</i> ) |
|--------|-----------------|------------------|----------|--------|---------------------------|
| Pair 1 | 31.01           | 33.62            | -4.83*   | 42     | 0.000                     |

Note. \* indicates  $P < 0.001$ .

Based on the findings presented in Table 3, the results of the paired sample t-test for the reading skills test within the experimental class yielded a p-value of 0.000, which is less than the significance level of 0.05. This signifies a substantial difference in scores before and after the test. Consequently, it is evident that the implementation of CIRC teaching effectively enhances the performance of primary school students in Chinese reading skills assessments.

### 3.2 Comparative Analysis of the Pre-Post Test Results of the Chinese Writing skills Test in the Experimental Class

Table 4. Pre-test and Post-test Normal distribution (Writing skills)

|           | Kolmogorov-Smirnova |    |       |
|-----------|---------------------|----|-------|
|           | Statistical data    | df | Sig   |
| Pre-test  | 0.148               | 43 | 0.083 |
| Post-test | 0.131               | 43 | 0.072 |

The data presented in Table 4 indicate that both the pretest and posttest datasets exhibited a normal distribution. As a result, parametric statistical methods were employed for the analysis.

Table 5. Paired sample t-test for pre-post test Writing skill scores in experimental classes

|        | Pre-test scores | post-test scores | <i>t</i> | Degree | Significance ( <i>p</i> ) |
|--------|-----------------|------------------|----------|--------|---------------------------|
| Pair 1 | 13.26           | 15.15            | -5.64*   | 42     | 0.000                     |

Note. \* indicates  $P < 0.05$ .

Based on the data presented in Table 5, the results of the paired sample t-test for the pre-post test of writing skills indicate a p-value of 0.000, which is less than the significance level of 0.05. This observation signifies a significant difference in the scores before and after the test. Consequently, it is evident that the implementation of a CIRC teaching experiment effectively enhances the performance of primary school students in writing skills assessments.

## 4. Discussion

### 4.1 Discussion on Improving Reading Skills of Primary School Students

The present study employed statistical analysis to examine the pre and post test scores of the reading skills proficiency test. The findings revealed a significant increase in the average reading skills scores of the experimental class in the post test compared to the pre test. These results align with previous research conducted by Nasab (2017), AlMunawwarah (2013), Doni (2018), Fan (2017), Jiang (2019), Kang (2017), Pisheh (2017), Zalmansyah (2018), and Keramati (2011). There are several justifications for enhancing the reading abilities of elementary school kids through the utilization of CIRC analysis.

The Collaborative Investigative Research Cycle (CIRC) is an educational approach that fosters collaborative and

exploratory learning. It encourages students to engage in higher-order thinking by building upon their foundational understanding of the subject matter. In this procedural undertaking, students are required not only to acquire knowledge pertaining to specific subject matter, but also to amass, peruse, scrutinize, and arrange a substantial quantity of pertinent material. Furthermore, students engage in the active application of topic information, as well as the construction of a comprehensive knowledge framework, while consistently engaging in the processes of learning, application, and knowledge transfer throughout the CIRC process. In contrast to conventional classroom instruction, students' learning activities exhibit greater breadth and depth. Furthermore, within the educational setting of the CIRC (Collaborative Strategic Reading) approach, instructors employ a strategy of grouping students into distinct cohorts to engage in cooperative learning. This method aims to facilitate the resolution of any challenges encountered throughout the reading process by encouraging collaborative problem-solving. Additionally, teachers exemplify the cognitive processes involved in reading comprehension to students. Subsequently, children attain pertinent knowledge and develop reading proficiency. During the cooperative learning stage, students apply their acquired information and skills to address analogous issues, thereby reinforcing their gained knowledge in a timely manner and constructing a learning trajectory that progresses from specific to generic concepts. Furthermore, the implementation of the Classroom Instructional Research Center (CIRC) necessitates the division of pupils into smaller groups within the classroom. Consequently, teachers are tasked with overseeing a limited number of groups in total. They possess the requisite enthusiasm to effectively manage children who frequently stray from the confines of the classroom.

#### *4.2 Discussion on Improving Writing Skills of Primary School Students*

Statistical analysis of the pre- and post-test scores of the writing skill level test revealed that the average post-test scores of the experimental class were substantially higher than their pre-test scores. This research finding is consistent with previous findings (Zhang, 2016; Makmuri, 2019; Nurista, 2015; Sachs et al., 2003; Shaaban, 2006). Therefore, it can be concluded that the use of CIRC in this study can effectively enhance or improve students' writing performance. Following is an analysis of the factors for the improvement of primary school students' writing skills: Students engage in cooperative learning, cooperative construction, cooperative investigation, and a combination of reading and writing practice in the teaching of Chinese language courses at CIRC. This strategy eliminates the situation in which reading and writing courses are taught separately and integrates reading and writing instruction. The enhancement of reading abilities will have some effect on writing abilities. Second, in CIRC instruction, students must begin with problems, read and assimilate a large quantity of materials, and apply their knowledge creatively to solve new problems. Changes will occur in the reading and writing behaviors of elementary school pupils during this process. In addition to proposing solutions to problems and writing practice essays, students must also communicate and cooperate with one another, transmit and share knowledge and materials, and learn from one another. In this learning process, students must not only read, but also conduct extensive retrieval, internalization analysis, and material integration. As a result, students' writing skills will inevitably be utilized, and they will consequently be enhanced. Thirdly, in the CIRC classroom, students must actively consider, investigate, and collaborate in order to complete writing assignments. Bruner's discovery learning theory is consistent with the roles and learning processes enacted by teachers and students in the classroom. The discovery learning theory can explain the development of students' writing skills through CIRC instruction, in particular the consistency between problem-solving and ideation skills in writing skills and the Bruner-promoted discovery process. Lastly, the CIRC classroom provides students with a forum for mutual discussion, comprehension, and adoption of diverse perspectives on the same topic. Through learners' cooperation, the comprehension becomes richer and more comprehensive. It shares the constructivist emphasis on initiative, sociality, and the situational nature of learning, as well as the comprehension of the essence of learning. After the experiment, students' writing skills significantly improved, according to constructivist theory. This is evidenced by a broader perspective in writing and the ability to accept constructive feedback from others, which is exactly what CIRC's tolerant communication platform offers.

## **5. Conclusion**

### *5.1 Conclusion*

In conclusion, this study has provided compelling evidence of the positive impact of Cooperative Integrated Reading and Composition (CIRC) on primary school students' language skills. Specifically, the findings underscore two key outcomes:

- 1) The implementation of CIRC in Chinese reading instruction yields a significant improvement in the reading skills of primary school students.
- 2) The application of CIRC in the context of Chinese language instruction effectively enhances primary school



students' writing skills.

These outcomes underscore the effectiveness of CIRC as an instructional strategy in fostering language proficiency among primary school students, both in the domains of reading and writing. These results contribute valuable insights to the pedagogical landscape, emphasizing the potential benefits of CIRC as a method for enhancing language skills within primary education.

### *5.2 Recommendations*

Based on the findings of this study, the researchers propose that there is a need to further enhance the teaching methodology of Chinese reading instruction by incorporating the principles of Cognitive Information Processing (CIRC). The CIRC (Collaborative Inquiry-based Reading Circles) program should commence by implementing a meticulous process for selecting reading subjects. Additionally, it should aim to foster students' reading requirements through the establishment of collaborative learning environments. In the course of problem-solving, collaborative group members employ advanced cognitive methods, including problem analysis, resource retrieval, and inference analysis, to generate innovative solutions and foster genuine learning results derived from the reading material. It is imperative to closely monitor the academic achievements of students across all proficiency levels and further enhance the beneficial influence of Computerized Instructional Resource Centers (CIRC). The present study reveals that the implementation of CIRC (Cooperative Integrated Reading and Composition) exhibits a favorable influence on the overall student population. However, it is noteworthy that the extent of this impact varies among students at different proficiency levels. Students who exhibit below-average academic performance have the potential to derive greater benefits from the implementation of the Classroom Instructional Reinforcement and Coaching (CIRC) approach, hence facilitating accelerated advancement. Hence, it is imperative for educators to consider the varying levels of student learning performance, provide active guidance, and make necessary adjustments to the specific content of the instructional plan while implementing CIRC techniques in reading instruction. It is imperative to emphasize the provision of comprehensive guidance and support in all facets of students' reading and writing endeavors, with the aim of amplifying the beneficial effects of the Collaborative Strategic Reading (CIRC) approach. (3) Ensure the provision of enough resources to support teaching in the CIRC. The Collaborative Inquiry-based Reading Comprehension (CIRC) approach diverges from conventional methods of reading instruction by emphasizing collaborative learning. To enhance the efficacy of reading comprehension, students frequently find it necessary to amass, arrange, and incorporate a substantial volume of reading materials. Hence, it is imperative to ensure adequate resource support for the implementation of CIRC in reading instruction.

### *5.3 Limitations*

The total duration of this study spanned two and a half months, a relatively abbreviated time frame that, to some extent, may have impacted the effectiveness of the experimental investigation. Due to the prevailing influence of the epidemic and the selection of specific experimental schools, the research was restricted to a single third-grade class within the primary school. The research design employed a quasi-experimental approach involving single-group pre- and post-tests for educational experiments. While the experimental procedures meticulously controlled for extraneous variables, the absence of a control group for comparative analysis renders it challenging to regulate the influence of factors such as students' historical backgrounds and developmental maturity on the experimental outcomes. The constraints associated with the research tools encompass an evaluation of the test paper's structure, reliability, and validity, all of which conform to established standards for scientifically rigorous testing instruments. Nevertheless, reliance solely on test paper analysis for interpreting experimental results may warrant further enhancements in terms of the scientific rigor and comprehensiveness of the experimental methodology.

### **Acknowledgements**

We are very grateful to the expert team of Mahasarakham University School of Education and colleagues of Liuzhou Yucai Road Primary School.

### **Authors' contributions**

Not applicable.

### **Funding**

This research project was financially supported by Mahasarakham University.

### **Competing interests**

Not applicable.

**Informed consent**

Obtained.

**Ethics approval**

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.

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