

Cooperative learning using CIRC techniques with mind mapping on reading comprehension skills and summarizing skills of local literature for Grade 7 students

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Article Info	Abstract
Received: 05 March 2026 Reviewed: 10 March 2026 – 30 May 2026 Accepted: 20 June 2026 Published: 30 June 2026	Purpose This research aimed to (1) compare students' reading comprehension and summary writing skills before and after participating in Cooperative Learning using the CIRC technique combined with mind mapping, and (2) examine differences in these abilities between students who learned through the CIRC technique with mind mapping and those who received conventional instruction. Methodology The study involved 80 Grade 7 (Mathayom 1) students, split equally into an experimental group (40) and a control group (40). Pre-tests were administered to both groups before the 5-week intervention (15 hours total). The experimental group received CIRC combined with mind mapping on local literature, while the control group received conventional instruction. Post-tests were administered immediately after the intervention to measure skill gains and analyze differences statistically. Results/Findings The results showed that: (1) post-test scores of the experimental group were significantly higher than their pre-test scores ($p < .05$), and (2) students taught using the CIRC technique with mind mapping achieved significantly higher scores than those in the conventional group ($p < .05$). This indicates that CIRC's structured cooperative framework effectively enhances language skills, critical thinking, and main idea identification. Implications Teachers should integrate the CIRC model with mind mapping to systematically improve reading comprehension and summary writing skills. To optimize results, instructors should strictly follow the CIRC procedure while catering to individual differences. Additionally, consistent mind mapping practice, supported by guidance and examples, will enable students to synthesize content and write summaries more proficiently.
Keywords: Cooperative learning using CIRC techniques with mind mapping; reading comprehension skills; summarizing skills; local literature	

1. Introduction

Thai serves as the national language and a foundational medium for communication, learning, and daily life. The Basic Education Core Curriculum B.E. 2551 (Revised Edition B.E. 2560) underscores the development of listening, speaking, reading, and writing skills as essential competencies for academic achievement across all subject areas and for effective communication in broader social contexts (Ministry of Education, 2017; Office of

the Basic Education Commission, 2018).

Local literature occupies a significant place within Thailand's cultural heritage. Through folktales, legends, songs, and proverbs, students encounter local wisdom, traditions, beliefs, and values that are deeply embedded in Thai society. Engaging with local literary texts also offers a meaningful context for developing reading comprehension and summary writing skills, as students must identify key ideas, interpret meanings, and articulate their understanding in written form (Thawat Punnothok, 2019). Despite these potential benefits, classroom observations have revealed that many students struggle to identify main ideas and organize information systematically when reading local literary texts, leaving their summary writing skills at a relatively low level.

This challenge is reflected in international assessments. Thai students' reading performance on the Programmed for International Student Assessment (PISA) declined from 441 points in 2012 to 379 points in 2022, with more than 60% of students failing to reach the minimum proficiency level in reading literacy (OECD, 2019; OECD, 2023; World Bank, 2020). Comparable difficulties were observed among the Grade 7 students who participated in the present study. The two classrooms selected as the research sample recorded average scores of 58.63% and 61.13% on the midterm Thai language examination. Although both cohorts met the minimum passing criterion, a considerable number of students demonstrated limited capacity in reading comprehension and summary writing.

Conventional classroom instruction tends to prioritize teacher-centered explanation and content memorization. While cooperative learning approaches such as Student Teams-Achievement Divisions (STAD) and Jigsaw have been employed to enhance learning outcomes, students may still encounter difficulties in organizing ideas and constructing effective written summaries. There is, therefore, a clear need for an instructional approach that supports both reading comprehension and the systematic organization of ideas.

The Cooperative Integrated Reading and Composition (CIRC) technique is a structured cooperative learning approach in which students work collaboratively in small groups to read, discuss, and write (Slavin, 1995). Complementing this, Mind Mapping enables students to organize ideas visually and to make explicit the relationships among concepts (Buzan, 2006). The integration of CIRC with Mind Mapping may therefore strengthen students' comprehension of reading materials and enhance their ability to produce coherent summaries.

Against this background, the present study examined the effects of cooperative learning using the CIRC technique combined with Mind Mapping on the reading comprehension and summary writing skills of Grade 7 students engaging with local literature. The findings are intended to contribute practical insights for the improvement of Thai language teaching and learning.

2. Literature review

Thai serves as the national language and a foundational medium for communication, learning, and daily life. The Basic Education Core Curriculum B.E. 2008 (Revised Edition B.E. 2017) underscores the development of listening, speaking, reading, and writing skills as essential competencies for academic achievement across all subject areas and for effective communication in broader social contexts (Ministry of Education, 2017; Office of the Basic Education Commission, 2018). Local literature occupies a significant place within Thailand's cultural heritage. Through folktales, legends, songs, and proverbs, students encounter local wisdom, traditions, beliefs, and values that are deeply embedded in Thai society. Engaging with local literary texts also provides a meaningful context for developing reading comprehension and summary writing skills, as students must identify key ideas, interpret meanings, and articulate their understanding in written form (Thawat Punnothok, 2019). Despite these potential benefits, classroom observations have revealed that many students struggle to identify main ideas and organize information systematically when reading local literary texts, resulting in relatively low summary writing skills. This challenge is reflected in international assessments. Thai students' reading performance on the Programme for International Student Assessment (PISA) declined from 441 points in 2012 to 379 points in 2022, with more than 60% of students failing to reach the minimum proficiency level in reading literacy (OECD, 2019; OECD, 2023; World Bank, 2022). Comparable difficulties were observed among the Grade 7 students who participated in the present study: the two classrooms selected as the research sample recorded average scores of 58.63% and 61.13% on the midterm Thai language examination. Although both cohorts met the minimum passing criterion, a considerable number of students demonstrated limited capacity in reading comprehension and summary writing.

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collaboratively in small groups to read, discuss, and write (Slavin, 1995). Complementing this, Mind Mapping enables students to organize ideas visually and to make explicit the relationships among concepts (Buzan, 2006). The integration of CIRC with Mind Mapping may therefore strengthen students' comprehension of reading materials and enhance their ability to produce coherent summaries. Against this background, the present study examined the effects of cooperative learning using the CIRC technique combined with Mind Mapping on the reading comprehension and summary writing skills of Grade 7 students engaging with local literature. The findings are intended to contribute practical insights for the improvement of Thai language teaching and learning.

3. Research method

3.1. Research design

This study employed a quasi-experimental design with a pre-test–post-test control group structure. Data were collected through the following procedures.

Prior to instruction, pre-tests assessing reading comprehension and summary writing skills were administered to both groups. The sample consisted of 80 Grade 7 students, divided equally into an experimental group and a control group of 40 students each.

The experimental group received 15 instructional sessions employing a cooperative learning approach that integrated the CIRC technique with Mind Mapping, using local literature as the content focus, while the control group received 15 sessions of conventional classroom instruction. Both groups followed an identical schedule of one hour per day, three days per week, over five consecutive weeks, and all instructional sessions were planned and delivered by the researcher. Upon completion of the instructional period, the same reading comprehension and summary writing assessments administered at the pre-test stage were re-administered to both groups as post-tests.

3.2. Research participants

3.2.1. Population

The population consisted of 636 Grade 7 students from 17 classrooms at a school in Mueang District, MahaSarakhm Province, during the second semester of the 2025 academic year.

3.2.2. Sample

The sample consisted of 80 Grade 7 students from two classrooms at the same school, obtained through cluster random sampling. The experimental group comprised 40 students from Classroom 1/6, who received instruction using the cooperative learning approach integrating the CIRC technique with Mind Mapping, while the control group comprised 40 students from Classroom 1/7, who received conventional instruction.

3.3. Research instruments

3.3.1 Instructional instruments

Lesson Plans. A total of eight lesson plans were developed for the Basic Thai Language course (TH 21102) under the Thai Language Learning Area, designed for Grade 7 (Mathayom 1) students. The plans integrated the Cooperative Integrated Reading and Composition (CIRC) technique with Mind Mapping and ranged from one to two hours in duration, amounting to a total of 15 instructional hours.

3.3.2 Data collection instruments

Reading Comprehension Test. A multiple-choice test with four options per item, designed to assess students' reading comprehension skills.

Summary Writing Ability Test. An open-ended test assessing summary writing skills, evaluated using an analytic scoring rubric.

3.4. Procedures of data collection

Prior to instruction, a reading comprehension test and a summary writing ability test were administered to both groups of Grade 7 students, two groups of 40 students each, totaling 80 students.

The researcher planned and organized the instructional activities and personally conducted all teaching sessions. The experimental group received instruction based on the CIRC cooperative learning plan integrated with Mind Mapping, using local literature as the instructional content, over 15 sessions of one hour each, three sessions per week, for five weeks. The control group received instruction using conventional lesson plans, following the same schedule of 15 sessions of one hour each, three sessions per week, for five weeks.

Following the instructional period, the same reading comprehension test and summary writing ability test used in the pre-test were re-administered to both groups as post-tests.

3.5. Technique of data analysis

The researcher analyzed the data using computer software, following the sequence of steps below:

- Basic descriptive statistics, including percentage, mean, and standard deviation, were calculated.
- The reading comprehension and summary writing skill scores were compared as follows: 2.1) pre-test and post-test scores on reading comprehension and summary writing skills, obtained from the cooperative learning activities using the CIRC technique combined with Mind Mapping, were compared using a dependent samples t-test. 2.2) Post-test scores on reading comprehension and summary writing skills between the group receiving cooperative learning management with CIRC and Mind Mapping and the group receiving conventional instruction were compared using an independent samples t-test.

4. Results

4.1. Part 1: Comparison of pre-test and post-test scores in reading comprehension and summary writing skills following cooperative learning using the CIRC technique combined with mind mapping

Research Objective 1 was to compare reading comprehension and summary writing skill scores before and after participation in cooperative learning activities using the CIRC technique combined with Mind Mapping. To this end, the researcher proceeded as follows.

The sample group—an experimental classroom of 40 students obtained through cluster random sampling—completed the same set of reading comprehension and summary writing skill tests both before and after instruction. The reading comprehension test was a four-option multiple-choice test consisting of 30 items, each with a single correct answer, yielding a full score of 30 points. The summary writing skill test was an open-ended test evaluated using an analytic rubric, consisting of five items worth four points each, for a total full score of 20 points. A total of 60 minutes was allotted for completing both tests. The results of the comparison of reading comprehension scores before and after instruction are presented in Table.

Table 1: The comparison of reading comprehension scores

Testing	df	Full Score	$\bar{x}$	S.D.	t-test	p-value
reading comprehension skills (pre-test)	39	30	14.28	2.57	18.16	< .001
reading comprehension (post-test)		30	22.83	3.70		

As shown in the table, the comparison of pre-test and post-test reading comprehension scores among students who participated in the cooperative learning activities using the CIRC technique combined with Mind Mapping revealed that the mean post-test score ($M = 22.83$, $SD = 3.70$) was higher than the mean pre-test score ($M = 14.28$, $SD = 2.57$). A dependent samples t-test indicated a statistically significant difference, $t(39) = 18.16$, $p < .001$, demonstrating that students' post-test reading comprehension skills were significantly higher than their pre-test skills at the .05 level of significance.

Comparison of Pre-test and Post-test Summary Writing Skill Scores of the Sample Group (Experimental Classroom) Following Cooperative Learning Activities Using the CIRC Technique Combined with Mind Mapping.

Table 2: The comparison of writing skill scores

Testing	df	Full Score	$\bar{x}$	S.D.	t-test	p-value
summarizing skills (pre-test)	39	20	5.98	1.40	40.17	< .001
summarizing skills (post-test)		20	13.15	1.87		

As shown in the table, the comparison of pre-test and post-test summary writing scores among students who participated in the cooperative learning activities using the CIRC technique combined with Mind Mapping revealed that the mean post-test score ($M = 13.15$, $SD = 1.87$) was higher than the mean pre-test score ($M = 5.98$, $SD = 1.40$). A dependent samples t-test indicated a statistically significant difference, $t(39) = 40.17$, $p < .001$, demonstrating that students' post-test summary writing skills were significantly higher than their pre-test skills at the .05 level of significance.

These findings indicate that students' reading comprehension and summary writing skills following instruction through the cooperative learning activities using the CIRC technique combined with Mind Mapping were significantly higher than before instruction, thereby confirming Research Hypothesis 1.

4.2. Part 2: Comparison of reading comprehension and summary writing skills between students receiving cooperative learning activities using the CIRC technique combined with mind mapping and students receiving conventional instruction

To address Research Objective 2, the researcher compared the post-test scores on reading comprehension and summary writing skills between the experimental group, which received the cooperative learning activities using the CIRC technique combined with Mind Mapping, and the control group, which received conventional instruction. The results of the comparison of reading comprehension scores between the experimental and control groups are presented in Table.

Table 2: The comparison of reading comprehension scores

Testing	Sample Group	df	Full Score	$\bar{x}$	S.D.	t-test	p-value
reading comprehension (post-test)	Control Group	78	30	18.27	2.35	6.56	< .001
	Experimental Group		30	22.83	3.70		

As shown in the table, the comparison of post-test reading comprehension scores between the experimental and control groups revealed that the experimental group had a higher mean score ($M = 22.83$, $SD = 3.70$) than the control group ($M = 18.27$, $SD = 2.35$). An independent samples t-test indicated a statistically significant difference, $t(78) = 6.56$, $p < .001$, demonstrating that the experimental group's reading comprehension skills were significantly higher than those of the control group at the .05 level of significance.

The results of the comparison of summary writing skill scores between the experimental and control groups are presented in Table.

Table 3: The comparison of writing skill scores

Testing	Sample Group	df	Full Score	$\bar{x}$	S.D.	t-test	p-value
summary writing skill (post-test)	Control Group	78	20	9.68	1.37	9.74	< .001
	Experimental Group		20	13.15	1.87		

As shown in the table, the comparison of post-test summary writing scores between the experimental and control groups revealed that the experimental group had a higher mean score ($M = 13.15$, $SD = 1.87$) than the control group ($M = 9.68$, $SD = 1.37$). An independent samples t-test indicated a statistically significant difference, $t(78) = 9.74$, $p < .001$, demonstrating that the experimental group's summary writing skills were significantly higher than those of the control group at the .05 level of significance.

Overall, students' mean scores on both reading comprehension and summary writing skills after instruction were significantly higher than before instruction at the .001 level for both skills. These findings demonstrate that students who received cooperative learning management using the CIRC technique combined with Mind Mapping achieved higher reading comprehension and summary writing skills than students who received conventional instruction, thereby confirming Research Hypothesis 2.

5. Discussions

5.1. Comparison of skills before and after the intervention

Students who received instruction through the CIRC technique combined with Mind Mapping demonstrated significantly higher post-test scores in both reading comprehension and summary writing than their pre-test scores, at the .05 level of significance. This improvement may be attributed to the structured nature of the CIRC technique, which systematically develops language skills through a sequence of activities encompassing oral reading, vocabulary comprehension, and identification of main ideas, thereby encouraging deeper analytical engagement among students. This finding is consistent with Kaewwan (2021), who reported that students taught using CIRC combined with Mind Mapping achieved higher learning outcomes, and with Maethawadee Chapchu (2022), who noted that instructional activities providing opportunities for discussion and collaborative summarization effectively enhance students' communication skills.

In the present study, Mind Mapping was integrated into the summarization stage of instruction. As a cognitive organizational tool, Mind Mapping enabled students to structure their thoughts and visualize relationships among key concepts, thereby supporting the production of systematic written summaries. This finding is corroborated by Pinman (2024), who found that combining Mind Mapping with language teaching techniques improves both information processing and written expression. Taken together, these findings suggest that the integration of CIRC and Mind Mapping meaningfully enhances students' reading comprehension and summary writing achievement.

5.2. Comparison between the experimental and control groups

The experimental group, which received instruction through the CIRC technique combined with Mind Mapping, outperformed the control group, which received conventional instruction, at the .05 level of significance. This difference may be explained by the limitations inherent in conventional instruction, which tends to emphasize teacher-led lectures and individual exercises, thereby restricting opportunities for student interaction and collaborative knowledge construction. By contrast, the CIRC technique is structured around a group process in which students work collaboratively to address reading and writing challenges, fostering greater engagement and learning motivation. This is consistent with Nurainun and Nasution (2024), who found that CIRC produced significantly greater gains in reading and writing skills compared with conventional instructional methods.

6. Conclusions and suggestions

6.1. Conclusions

The research entitled "Cooperative Integrated Reading and Composition (CIRC) Technique with Mind Mapping on Reading Comprehension and Summary Writing Skills of Local Literature for Grade 7 Students" yielded the following key findings, presented in sequential order.

First, Grade 7 students taught using the CIRC technique combined with Mind Mapping demonstrated significantly higher post-test scores in reading comprehension and summary writing than their pre-test scores, at the .05 level of significance ($p < .05$). This improvement may be attributed to the structured process underlying the CIRC model, which promotes systematic language skill development through a sequence of activities—ranging from oral reading and vocabulary acquisition to main idea extraction—thereby fostering deeper analytical engagement during reading. This finding is consistent with Kaewwan (2021), who reported that students instructed through the CIRC model integrated with Mind Mapping achieved significantly higher post-test learning outcomes, and with Chapchu (2022), who found that instructional activities promoting collaborative discussion and content synthesis effectively enhance students' communication skills.

In the present study, the integration of Mind Mapping during the synthesis stage served as a cognitive tool that enabled students to organize their thinking and visually represent key relationships within the narrative, thereby supporting the systematic translation of ideas into written summaries. This finding supports the work of Pinman (2024), who reported that combining Mind Mapping with language teaching techniques enhances both information processing and written expression. Taken together, these results indicate that the integration of the CIRC technique with Mind Mapping substantially improved students' reading comprehension and writing performance following the intervention.

Second, the comparison between the experimental and control groups revealed that the experimental group—instructed through CIRC combined with Mind Mapping—achieved significantly higher mean scores in reading comprehension and summary writing than the control group, which received conventional instruction ($p < .05$). This difference may be attributed to the limitations of conventional instruction, which relies heavily on lecture-based delivery and individual exercises, thereby restricting opportunities for interaction and collaborative learning. By contrast, the CIRC technique is grounded in a collaborative group process in which peers support one another in overcoming reading and writing difficulties, thereby fostering greater learning motivation. This finding is consistent with international research by Nurainun and Nasution (2024), who found that the CIRC technique yielded superior reading comprehension and writing outcomes compared with conventional methods.

Furthermore, the implementation of Mind Mapping reduced the cognitive load associated with processing complex information, enabling the experimental group to achieve deeper content comprehension and produce more effective summaries than the control group. This finding aligns with Fathoni (2022) and Arweb and Haq (2021), who similarly reported that cooperative learning supported by graphic organizers enhances students' language skills more rapidly and effectively than conventional approaches, resulting in superior reading comprehension and summary writing outcomes among students in the experimental group.

6.2. Recommendations

6.2.1 Recommendations for practical application

- Implementation in Instruction. Language teachers should apply the CIRC technique combined with Mind Mapping to systematically enhance students' reading comprehension and summary writing skills.
- Fidelity to Instructional Procedures. Learning activities should strictly adhere to the stages of the CIRC model while accounting for individual student differences, in order to ensure equitable participation and active engagement among all learners.

- Continuous Practice with Mind Mapping. Educators should consistently promote the use of Mind Mapping, accompanied by appropriate guidance and modeling, to enable students to summarize content efficiently and construct well-organized written summaries.

6.2.2. Recommendations for future research

- Expanding Scope and Sample Diversity. Future studies should examine the CIRC model combined with Mind Mapping across more diverse student populations, including different grade levels and school contexts, in order to enhance the generalizability of the findings.
- Investigating Additional Competencies. Future research should explore the effects of this instructional model on other key competencies, such as analytical thinking, communication skills, and various genres of writing, in order to generate more comprehensive empirical evidence.

7. Ethics statements

The studies involving human participants were reviewed and approved by the Institutional Review Board of Masarakham University, Thailand (Approval No. 044-912/2026). The participants provided their written informed consent to participants in this study prior to data collection.

Declaration of conflicting interest

The authors declare that there is no conflict of interest in this work

Funding acknowledgment

This research constitutes part of a master's thesis entitled "Cooperative Learning Using the CIRC Technique Combined with Mind Mapping on Reading Comprehension and Summary Writing Skills of Local Literature for Grade 7 Students," conducted by Ms. Araya Saenboran under the guidance and supervision of Associate Professor Dr. Jiraporn Chano. This research was supported by the Faculty of Education, Maha Sarakham University. The researcher wishes to express sincere gratitude to Sarakhampittayakom School and all participating students for their invaluable cooperation throughout the data collection process. It should be noted that while the core content and original ideas were entirely developed and authored by the researcher, artificial intelligence (AI) was employed to refine the language in accordance with international academic standards.

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