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Enhancing Analytical Reading Skills in Elementary School Students through Self-Regulation and Collaborative Learning

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Abstract

The purpose of this study was to investigate the effects of integrating self-regulation and collaborative learning on elementary school students' analytical reading skills. The study employed a one-group experimental design, involving 39 Grade 3 students from public schools in Thailand. A learning management system was developed based on needs analysis and expert evaluation, incorporating principles of self-regulated and collaborative learning. Instruments included an analytical reading test, a learning achievement test, and a rubric for systematic assessment. Data were analyzed using mean scores, standard deviation, percentage, and one-sample t-tests. Results indicated that participants' analytical reading skills and learning achievement significantly improved. These findings contribute to the understanding of how self-regulated and collaborative learning can enhance educational outcomes, particularly in elementary language education.

Keywords: analytical reading, self-regulations, collaborative learning

1. Introduction

Reading is a gateway to success in students' educational journeys (Butterfuss et al., 2020; Ciampa, 2012; Kendeou et al., 2016) as the skills itself opens doors to a wealth of knowledge and serves as a critical tool for both academic achievement and practical life skills. At the elementary level, students begin their reading journey by mastering the basics, such as using alphabetic symbols and vowels to represent spoken sounds (Navarrete et al., 2023). Basically, reading processes are related to the way learners put attempts to decode words, which they then combine to understand sentences and passages (Bucheit, 2023). In more complex level, reading learners have to more than just decoding as reading becomes a means of comprehension, critical thinking, and analysis. Therefore, the ability to read effectively enable students to use skills they need to access, interpret, and utilize information across various subjects, laying the groundwork for lifelong learning and success (Westerveld et al., 2020)

According to Whimbey (1989), analytical reading can be defined as the process of critically examining and interpreting a text to understand its deeper meaning, structure, and the relationships between its elements and it is crucial skill for reading. While this concept may seem complex and beyond the level of elementary school students, it is essential to introduce them to the fundamental components of text analyzing. This is to give then chances to practice the basic skills of analyzing text elements and interpreting meaning, which could make them gradually build their capacity for more sophisticated reading comprehension (Jing, 2023). Therefore, it can be useful help learners overcome common reading challenges but also paves the way for success in their future educational endeavors.

However, developing analytical reading skills is a complex process, as it requires a combination of factors to ensure success. In detail, teachers must create a learning environment that fosters curiosity and critical thinking. They should encourage students to question what they read, guide them in identifying key elements of the text, and help them make connections between different ideas. This involves using strategies such as guided reading, discussions, and the use of open-ended questions to stimulate deeper thinking (Gao, 2019; Hazaea & Alzubi, 2017; Pennell, 2014). Additionally, teachers should model analytical thinking by demonstrating how to break down texts and interpret meanings, providing clear examples and consistent practice opportunities (Gao, 2019).

Especially for elementary school students, who are primarily focused on mastering basic reading skills, teaching

them to read with an analytical mindset can be particularly challenging (Coplan et al., 2014). Young learners are just beginning to understand the mechanics of reading, so introducing them to more complex skills like analysis requires careful scaffolding. Teachers must be patient and gradually build these skills, ensuring that students first feel confident in their basic reading abilities before moving on to more advanced concepts (Faliyanti et al., 2021). Therefore, in teaching analytical reading, it is important to let learners practice critical thinking and also focus on developing self-regulation. To explain, activities should be designed to be engaging and interactive, providing opportunities for students to set goals, monitor their progress, and reflect on their learning.

Scholars (Schraw et al., 2006; Teng, 2022) have presented the meaning of self-regulated learning as a cyclical process where students plan, monitor, and reflect on their learning, which is particularly beneficial when developing complex skills like analytical reading. By setting reading goals, selecting strategies, and adjusting their approach based on outcomes, students can gradually become more independent and critical readers. In this approach, teachers play a role as a facilitator guiding students through this process, helping them to manage their learning effectively and build the confidence needed for analytical reading (Wijaya, 2022). This approach can encourage independence and critical thinking and is expected to result in improved learning outcomes as students learn to assess their progress and adapt their methods to better understand and analyze texts.

For young learners, it is essential to include engaging activities like problem-solving, practical tasks, and cooperative learning instead of depending only on traditional lectures. In detail, passive lecture-based teaching can lead to students becoming distracted and overlooking essential information (Coplan et al., 2014). In this situation, cooperative learning might likewise serve as a beneficial approach for instructing analytical reading. Slavin (1995, 2008, 2015) described collaborative learning as an instructional method where students collaborate to tackle problems, finish tasks, or grasp concepts, with every participant enhancing the group's overall success. Collaborative learning proves to be especially advantageous for enhancing analytical reading abilities in elementary school students, since it promotes discussion, critical thinking, and idea sharing (Bittinger, 2003). Through interactions with their classmates, students can examine various viewpoints, challenge beliefs, and enhance their comprehension of texts, which are all crucial elements of analytical reading.

Past and current research has increasingly highlighted the significance of self-regulation (Birgisdottir et al., 2020; Dickinson et al., 2019; Nejati, 2024; Skibbe et al., 2019) and collaborative learning (Ahmed Abdel-Al Ibrahim et al., 2023; Handayani et al., 2019; Vega et al., 2020) as valuable teaching approaches in reading education. Studies indicate that when students are given the ability to self-regulate, they acquire the skill to interpret complex texts with increased sophistication. Likewise, cooperative learning creates a setting in which students can participate in significant discussions, investigate various approaches, and develop critical thinking, thereby improving reading abilities. Even with these discoveries, there is still a lack of research regarding analytical reading in elementary education, as it is frequently viewed as too advanced for young students' developmental stages. However, basic practices of analytical reading can and ought to be developed even at this point. The study aimed to explore how combined self-regulation and collaborative learning impact analytical reading among elementary school students.

2. Methodology

2.1 Research Design

The study employed a one-group experimental design to evaluate the effectiveness of a learning management system rooted in self-regulated and collaborative learning principles. This system was meticulously developed through needs analysis and expert evaluation. It was implemented with 39 Grade 3 students in the Thai educational context. Instead of comparing pre- and post-intervention scores, the participants' performances after the intervention were assessed against a predetermined criterion of achieving at least 70 percent of the full mark to gauge the impact on their analytical reading skills.

2.2 Participants

The participants of the study were 37 Grade 3 students selected from public schools within the Thai educational context, specifically from the School Network under the jurisdiction of the Khon Kaen Primary Educational Service Area Office 4, Thailand. The sample was obtained through cluster random sampling, with schools serving as the sampling units. This group of students was chosen to represent the population of 243 students enrolled in the second semester of the 2022 academic year in the same network.

2.3 Instruments

2.3.1 Self-Regulation-Collaborative Learning Management for Analytical Reading

The learning management plan was designed to be included with the components of1) Principles, Concepts, and

Core Theories, 2) Goals, 3) Learning Management Processes, 4) Social Framework, 5) Principles of Responsiveness, and 6) Support Framework. The learning activities were designed based on self-regulated and collaborative learning principles, emphasizing skills like information analysis, data interpretation, comparison, summarization, and decision-making.

The development process involved two phases of data collection:

Phase 1: A needs analysis was conducted with 82 elementary teachers from various schools in Khon Kaen, Thailand, who completed a questionnaire on the current state and needs for developing analytical reading skills in elementary students. Additionally, 10 teachers were interviewed using an in-depth interview form, and relevant documents were analyzed to further inform the learning management design. The analysis indicated that teachers rated the challenges of managing learning at the highest level ($\bar{x}$ = 4.55, S.D = 0.77), and the need for learning management to enhance analytical reading was also rated at the highest level ($\bar{x}$ = 4.57, S.D = 0.24). Interviews revealed a strong desire for students to develop self-regulation in order to improve their analytical reading skills, as well as a preference for active and collaborative learning activities.

Phase 2 involved using the data collected in Phase 1 to develop the learning management system. Specifically, twelve sub-lesson plans were created, each consisting of two class hours. These lesson plans incorporated activities that combined self-regulated learning and collaborative learning principles.

For example, students might read a passage about environmental conservation, which is a topic well-suited for Grade 3 students, who are typically around 9 years old. The activities start with students establishing personal objectives, like pinpointing the central concept of the text or acquiring particular vocabulary associated with conservation. After this, students would participate in group discussions to express their understanding, resolve any misunderstandings, and examine various viewpoints. The lesson might conclude with a joint activity in which the students cooperate to summarize the text, utilizing visual tools such as concept maps to structure the details. This method not only strengthens self-regulation by prompting students to assess their understanding and modify their approaches, but also fosters teamwork skills by enabling them to collaborate towards a shared objective.

The learning management system was then evaluated by five experts across six aspects: background and significance, components, definition of analytical reading skills, learning management process, evaluation and assessment, and expected outcomes. The evaluation indicated a high level of appropriateness ($\bar{x}$ = 4.18, S.D = 0.24).

2.3.2 Analytical Reading Test

The test was designed to assess the participants' analytical reading skills through a written format comprising five items. In each item, students read a text and answered questions that evaluated their abilities in information analysis, data interpretation, comparison, summarization, and decision-making. The test was carefully constructed to ensure appropriate difficulty (p=0.2-0.8) and discrimination levels (r=0.2-1.0), with a Lovett reliability coefficient of 0.78. The students' responses were evaluated using a rubric scoring system, ensuring a standardized assessment of their analytical reading skills.

2.3.3 Analytical Reading Rubric

The rubric was developed to systematically assess the analytical reading skills of the participants. It features four levels of proficiency across five key aspects including information analysis, data interpretation, comparison, summarization, and decision-making. The rubric was validated by five experts including professional teachers and scholars in education. The test of content validity was found to be appropriate (IOC = 0.5-1.0). Overall, each test item has a full mark of 20 points aiming to test a students' analytical reading skills.

2.3.4 Learning Achievement Test

The learning achievement test was developed to assess students' language performance, focusing on both their learning from the semester and their analytical reading skills. The test consists of 20 four-multiple-choice items. The test items were with appropriate levels of difficulty and discrimination. The reliability of the test indicate the consistency of the assessment (r_{cc}= 0.82).

2.4 Data Collection and Data Analysis

The data was gathered throughout the second term of the 2022 academic year. The classroom saw the implementation of the learning management system, and at the semester's conclusion, both the analytical reading and learning achievement assessments were conducted. The analysis of the data involved mean scores, standard deviation, percentage calculations, and a one-sample t-test to assess the effectiveness of the learning

management strategy.

3. Results

Table 1. Participants' analytical reading skills after the treatment

	Analytical Reading						
	Information analysis (20)	**Data interpretation (20)**	**Comparison (20)**	**Summarization (20)**	**Decision-making (20)**	**Sum (100)**	**p**
$\bar{x}$	17.17	17.28	17.54	18.17	18.61	88.79	0.00*
%	85.90	86.41	87.70	90.89	93.07	88.79	
S.D.	1.16	1.09	0.96	0.91	0.78	0.84	

*p>0.05

The results presented in Table 1 indicate that the participants' analytical reading skills, after the treatment, demonstrated a significant improvement, with an overall average score ($\bar{x}$ = 88.79, S.D = 0.84) out of 100. This score is substantially higher than the predetermined criterion of 70 (70% of the full mark), which was set as the benchmark for success. The statistical analysis confirms that this difference is significant (p = 0.00), indicating that the implemented learning management system effectively enhanced the analytical reading skills of the participants well beyond the expected threshold.

Table 2. Participants' learning achievement after the treatment

	n	**criterion**	**Maximum score**	$\bar{x}$	**S.D.**	%	**Sig.**
Learning achievement	39	14	20	17.97	1.46	89.86	.000*

*p>0.05

The results shown in Table 2 demonstrate that the participants' learning achievement after the treatment was significantly above the predetermined criterion. The average score ($\bar{x}$ = 17.97, S.D = 1.46) out of a maximum of 20 points corresponds to 89.86%, which surpasses the criterion score of 14. The statistical analysis confirms the significance of this improvement (p = .000), indicating that the learning management intervention was highly effective in enhancing the students' learning achievement beyond the expected benchmark.

4. Discussion

The results of this study clearly demonstrate the effectiveness of incorporating self-regulated learning and collaborative learning principles into language education. The significant improvement in both analytical reading skills ($\bar{x}$ = 88.79) and overall learning achievement ($\bar{x}$ = 17.97) highlights the positive impact of these instructional strategies. These findings align with previous research by Ahmed Abdel-Al Ibrahim et al. (2023), Birgisdottir et al. (2020), Dickinson et al. (2019), Handayani et al. (2019), Nejati (2024), Skibbe et al. (2019), and Vega et al. (2020), who also found these methods to be highly effective in educational settings.

Each component of the learning management system was intricately tied to the principles of self-regulated and collaborative learning, both of which played a crucial role in developing analytical reading skills among participants. The foundational principles and theories emphasized the importance of self-regulation by encouraging students to set goals and monitor their progress. The objectives provided clear, measurable outcomes that guided students' self-regulated efforts. Structured learning procedures ensured consistent engagement, while the social system promoted collaborative learning, enabling students to discuss and refine their understanding through peer interaction (Schraw et al., 2006; Slavin, 2008, 2015; Teng, 2022). Responsiveness allowed for the adaptation of teaching methods to individual needs, fostering both self-regulation and collaboration, while the support system ensured access to resources that facilitated this dual approach. This integration of self-regulated and collaborative learning not only enhanced students' analytical reading skills but also fostered a deeper, more engaged learning experience.

Furthermore, the development of analytical reading skills directly contributed to the participants' overall learning achievement (Whimbey, 1989). As students became more adept at analyzing, interpreting, comparing, summarizing, and making decisions based on textual information, their ability to perform well on broader academic tasks improved. This connection underscores the importance of teaching analytical reading as a foundational skill that enhances overall academic performance. The success of the intervention suggests that integrating self-regulation and collaboration into the learning process not only builds specific skills but also

fosters a deeper understanding and application of knowledge across different contexts.

5. Conclusion

The research effectively combined self-regulated learning and collaborative learning to create a robust learning management system, which was put into practice with Grade 3 students in the Thai educational setting. The findings indicated that this method considerably improved students' analytical reading abilities and overall academic performance, showcasing the success of integrating these teaching techniques. This study offers important perspectives on the effectiveness of self-regulated and collaborative learning in enhancing educational outcomes, especially within elementary language instruction.

The results of this research hold significant meaning for teachers and those designing curricula. Incorporating self-regulated and collaborative learning into instructional design can effectively promote critical thinking and enhance student engagement. This method could be broadly implemented in elementary education to improve not only analytical reading abilities but also various academic skills. Additionally, this research reinforces the notion that active learning techniques are successful in fostering a more engaging and student-focused classroom atmosphere, potentially resulting in improved learning results.

Although the study presents encouraging results, it has several limitations. The absence of a pre-treatment comparison complicates a comprehensive evaluation of the degree of improvement linked to the learning management system. Additionally, the lack of a well-defined control group makes it difficult to attribute the observed changes exclusively to the intervention. The research also lacked qualitative elements, such as student interviews or observations, which could have provided more profound insights into the learning experience. In addition, the limited sample size restricts the generalizability of the findings, suggesting a need for further studies with larger and more varied participant groups.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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

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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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