



The Effect of Using Collaborative Strategic Reading Integrated with Gamification on Learners' Reading Comprehension Ability and Learning Motivation

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Abstract

This research aimed to: 1) investigate the differences in learners' reading comprehension ability before and after using Collaborative Strategic Reading (CSR) integrated with gamification, and 2) investigate the differences in learners' learning motivation before and after using CSR integrated with gamification. The sample consisted of 22 Grade 10 learners at Tanangnaewwittayayon School, Waeng Noi District, Khon Kaen Province, selected through cluster random sampling. The study employed a pre-experimental one-group pretest–posttest design. Quantitative data were collected using six lesson plans based on CSR principles, integrated with gamification elements; a reading comprehension test measuring two dimensions (interpretation and expansion); and a learning motivation questionnaire assessing intrinsic and extrinsic motivation. The findings indicated that overall reading comprehension and learning motivation both improved significantly after the instructional intervention, with large-to-very-large effect sizes across all dimensions. These results confirm that CSR, integrated with gamification, effectively enhanced both reading comprehension and motivation to learn among Grade 10 EFL learners.

Keywords: Collaborative Strategic Reading (CSR), Gamification, Reading Comprehension, Learning Motivation, EFL Learners

Introduction

Background / Importance of the Issue / Research Variable (Main Idea)

Reading comprehension is a fundamental skill in English as a Foreign Language (EFL) learning, especially at the secondary level, where learners are required to process complex texts and construct meaning beyond literal understanding. Reading comprehension involves strategic and cognitive processes that enable learners to interpret information and expand ideas through inference and integration with prior knowledge (Grabe & Stoller, 2011). However, EFL learners in Thai secondary schools often demonstrate limited reading comprehension due to insufficient use of reading strategies, low engagement in reading activities, and inadequate exposure to authentic texts (Nation, 2019; Phakiti, 2003). At Tanangnaewwittayayon School, classroom observations and diagnostic results revealed that Grade 10 learners consistently struggled with both interpreting text meaning and extending ideas beyond the text, suggesting a need for structured, motivationally engaging reading instruction.

Research has increasingly emphasized that effective reading instruction should address both cognitive processes and motivational factors to promote meaningful learning and sustained engagement (Wigfield et al., 2016). Reading comprehension ability is a multidimensional construct encompassing interpretation and expansion. Interpretation refers to understanding explicit and implicit meanings within a text, whereas expansion involves extending ideas through inference and connection with prior knowledge (Grabe & Stoller, 2011). Collaborative Strategic Reading (CSR), developed by Klingner and Vaughn (1998), has been widely recognized as an effective approach for enhancing reading comprehension by integrating

explicit reading strategies with cooperative learning processes. CSR supports learners in actively constructing meaning through structured strategy use, resulting in improved comprehension outcomes in EFL contexts (Klingner et al., 2015).

Learning motivation is a key determinant of learners' engagement and achievement in language learning. Motivation is commonly classified into intrinsic motivation, driven by internal interest, and extrinsic motivation, influenced by external rewards (Dörnyei, 2001; Ryan & Deci, 2017). Studies have shown that motivated learners are more likely to engage in reading activities and achieve higher comprehension levels (Wigfield & Guthrie, 1997). Gamification has emerged as an instructional approach that enhances motivation by incorporating game elements into learning activities, thereby increasing learners' engagement and persistence (Deterding et al., 2011; Kapp, 2012). Recent studies have further confirmed that gamified instruction can improve both motivation and academic achievement in EFL classrooms (Hamari et al., 2016; Sailer et al., 2017).

Despite growing evidence supporting both CSR and gamification independently, limited empirical studies have examined their combined effects within a unified instructional framework. Most prior studies have investigated these approaches separately, leaving unresolved whether their integration produces synergistic benefits for both cognitive and motivational outcomes. This gap is particularly notable in secondary-level EFL contexts where both reading strategy instruction and motivational support are critically needed. The present study therefore aimed to address this gap by integrating CSR with gamification and investigating their combined effects on learners' reading comprehension ability and learning motivation. The connection between the cognitive-strategic foundation of CSR, the motivational scaffolding provided by gamification, and the self-determination framework underpinning both approaches forms the theoretical rationale for this intervention.

Questions

1. Is there a difference between the learners' reading comprehension ability before and after using the intervention?
2. Is there a difference between the learners' learning motivation before and after using the intervention?

Objectives

1. To investigate a difference between the learners' reading comprehension ability before and after using the intervention.
2. To investigate a difference between the learners' learning motivation before and after using the intervention.

Literature Reviews

Theoretical Foundations of the Study

This study is theoretically grounded in Social Constructivism Theory (Vygotsky, 1978), Cooperative Learning Theory (Johnson & Johnson, 1991), and Self-Determination Theory (Ryan & Deci, 2017), which collectively explain how instructional design can influence both cognitive and motivational learning outcomes. These three theories are interconnected in that they each address a distinct but complementary dimension of the instructional framework employed in this study. Social Constructivism Theory posits that learning occurs through social interaction and the co-construction of meaning within a sociocultural context. Accordingly,



reading comprehension is not viewed solely as an individual cognitive activity but as a socially mediated process in which learners negotiate meaning, clarify understanding, and extend interpretation through interaction. This theoretical perspective directly supports the use of CSR, which structures collaborative reading activities to promote shared sense-making.

Cooperative Learning Theory extends this perspective by emphasizing structured collaboration as a key mechanism for enhancing academic achievement and engagement. Johnson and Johnson (1991) identify positive interdependence, individual accountability, and promotive interaction as essential conditions for effective cooperative learning. These principles provide a strong theoretical foundation for CSR, which assigns defined roles to learners and requires them to work collaboratively to process texts, exchange ideas, and jointly construct understanding. This structured approach distinguishes CSR from unstructured group work and is central to its effectiveness.

Self-Determination Theory explains how instructional environments influence learners' motivation by supporting the basic psychological needs of autonomy, competence, and relatedness (Ryan & Deci, 2017). When these needs are satisfied, learners are more likely to develop intrinsic motivation, which is closely associated with sustained engagement and deeper learning. Gamification, when aligned with pedagogical objectives, can address all three psychological needs: it fosters a sense of competence through immediate feedback and progressive challenges, supports autonomy through meaningful task choices, and promotes relatedness through collaborative and competitive game elements. Together, these three theoretical frameworks form an integrated conceptual basis for examining how the combination of CSR and gamification can simultaneously enhance reading comprehension ability and learning motivation.

Collaborative Strategic Reading and Reading Comprehension

CSR is an instructional approach developed by Klingner and Vaughn (1998) that improves learners' reading comprehension through structured strategy use and peer collaboration. CSR aligns closely with social constructivist and cooperative learning principles by engaging learners in group-based reading activities emphasizing prediction, clarification, summarization, and questioning through four core strategies: preview, click and clunk, get the gist, and wrap up. Through these processes, learners actively construct meaning rather than passively receiving information.

In this study, reading comprehension is conceptualized as a multidimensional construct comprising interpretation and expansion. Interpretation refers to learners' ability to understand explicit and implicit meanings within a text, whereas expansion involves extending ideas beyond the text through inference, connection, and critical reflection. The collaborative nature of CSR supports both dimensions by allowing learners to articulate interpretations, negotiate meaning, and elaborate ideas through peer discussion. Prior research has consistently indicated that strategy-based collaborative reading approaches enhance comprehension by promoting deeper cognitive processing and metacognitive awareness (Klingner et al., 2015; Vaughn et al., 2011; Okkinga et al., 2018).

Gamification and Learning Motivation

Gamification refers to the integration of game elements—such as points, feedback, challenges, and rewards—into non-game learning contexts to enhance learners' engagement and motivation (Deterding et al., 2011; Kapp, 2012). From a Self-Determination Theory perspective, gamification is particularly effective when it supports learners' autonomy, competence, and relatedness. Well-designed gamified learning activities can enhance learners'

sense of competence through immediate feedback, promote autonomy through meaningful choices, and foster relatedness through collaborative challenges.

Learning motivation in this study consists of intrinsic motivation and extrinsic motivation. Intrinsic motivation reflects learners' internal interest and enjoyment in learning activities, whereas extrinsic motivation is driven by external incentives or recognition. Existing studies suggest that gamification, when aligned with pedagogical goals, can enhance both forms of motivation, with especially strong effects on intrinsic motivation when learners perceive learning tasks as enjoyable, meaningful, and socially connected (Hamari et al., 2016; Sailer et al., 2017; Landers, 2014).

Synthesis of Literature and Conceptual Framework

The reviewed literature demonstrates that collaborative learning strategies grounded in social constructivism are effective in enhancing reading comprehension, while gamification informed by Self-Determination Theory plays a significant role in strengthening learning motivation. Rather than describing these theories independently, the present study synthesizes them into a unified conceptual framework in which CSR serves as the cognitive-strategic instructional mechanism and gamification serves as the motivational design mechanism. The integration of CSR and gamification addresses both dimensions simultaneously, with CSR developing learners' strategic reading capacities and gamification sustaining their engagement and motivation throughout the learning process.

However, much of the existing research has examined CSR and gamification as separate instructional approaches. There remains a need for empirical studies that integrate both within a unified instructional framework and investigate their combined effects on cognitive outcomes (interpretation and expansion) and motivational outcomes (intrinsic and extrinsic motivation) among secondary EFL learners. Addressing this gap, the present study synthesizes these theoretical perspectives into a conceptual framework in which CSR integrated with gamification functions as the independent variable influencing learners' reading comprehension ability and learning motivation.

Methodology

Research Design and Participants

This study employed a pre-experimental one-group pretest–posttest design. The population comprised Grade 10 learners at Tanangnaewwittayayon School, Waeng Noi District, Khon Kaen Province, during the second semester of the 2024 academic year. The sample consisted of 22 Grade 10 learners from one intact classroom, selected through cluster random sampling. This sampling method was chosen because the school organizes learners into fixed classroom groups that cannot be randomly reassigned, making cluster sampling the most appropriate approach for maintaining ecological validity while allowing for practical implementation of the instructional intervention.

It is acknowledged that the one-group pretest–posttest design does not include a control group, which limits causal inference regarding the observed effects. Confounding variables such as history, maturation, and testing effects cannot be fully controlled. These limitations are noted and discussed in the recommendations for future research. The study assumed that the dependent samples t-test assumptions—including normality of difference scores and the paired nature of the data—were appropriate for the sample size of 22, consistent with recommendations in applied educational research (Pallant, 2020).

Research Variables

The research instruments included: (1) six lesson plans designed based on CSR principles integrated with gamification elements, (2) a reading comprehension test measuring

interpretation and expansion skills, and (3) a learning motivation questionnaire assessing intrinsic and extrinsic motivation.

Research Instruments and Instrument Quality

The research instruments included: (1) six lesson plans designed based on CSR principles integrated with gamification elements, (2) a reading comprehension test measuring interpretation and expansion skills, and (3) a learning motivation questionnaire assessing intrinsic and extrinsic motivation.

The six lesson plans were developed following the four stages of CSR (preview, click and clunk, get the gist, and wrap up) and incorporated gamification elements such as points systems, interactive challenges, and immediate feedback mechanisms. Each lesson plan was reviewed by three experts in EFL instruction and educational technology for content validity, and revisions were made based on their feedback before implementation.

The reading comprehension test comprised 20 items: 10 items measuring the interpretation dimension (understanding explicit and implicit text meanings) and 10 items measuring the expansion dimension (inference, connection, and critical reflection). The test was developed based on the reading comprehension framework of Grabe and Stoller (2011) and validated by three content experts (Index of Item Objective Congruence, $IOC \geq 0.67$). Item analysis was conducted using the difficulty index and discrimination index to ensure appropriate item quality. The test was pilot-tested with a group of 30 Grade 10 learners at a comparable school, yielding a reliability coefficient of $r = .82$ (KR-20), indicating high reliability.

The learning motivation questionnaire consisted of 20 items using a five-point Likert scale: 10 items measuring intrinsic motivation and 10 items measuring extrinsic motivation. Items were adapted from Dörnyei's (2001) motivational framework and validated by three experts ($IOC \geq 0.67$). Pilot testing with the same 30 learners yielded a Cronbach's alpha reliability coefficient of $\alpha = .86$, indicating high internal consistency.

Data Collection Procedures

Data were collected in three phases. In the pre-intervention phase, the reading comprehension test and motivation questionnaire were administered as pretests. During the intervention phase, six lesson plans based on CSR integrated with gamification were implemented over six weeks (one lesson per week, approximately 50 minutes per session). Each lesson followed a consistent four-stage CSR structure, with gamification elements embedded throughout: learners earned points for correct responses and collaborative contributions, received immediate feedback through digital tools, and participated in team challenges aligned with the reading tasks. In the post-intervention phase, the same instruments were re-administered as posttests.

Data Analysis

Descriptive statistics, including mean (M) and standard deviation (SD), were used to describe learners' reading comprehension ability and learning motivation levels. Inferential statistics were employed using a dependent samples t-test to examine differences between pretest and posttest scores. Statistical significance was determined at the $\alpha = .05$ level. Prior to the t-test, the normality of difference scores was examined using the Shapiro-Wilk test, and results supported the appropriateness of the parametric test. In addition, effect size (Cohen's d) was calculated to determine the magnitude of the instructional effects, accompanied by 95% confidence intervals, providing a comprehensive interpretation of practical significance.

Result

The results are presented in accordance with the two research questions to clearly demonstrate the effects of CSR integrated with gamification on learners' reading comprehension ability and learning motivation.

Research Question 1: Reading Comprehension Ability

The findings revealed a statistically significant improvement in learners' overall reading comprehension ability after the implementation of CSR integrated with gamification. The dependent samples t-test indicated that the posttest mean score was significantly higher than the pretest mean score at the .05 level, demonstrating the effectiveness of the instructional intervention.

When examined by dimension, both interpretation and expansion showed significant increases from pretest to posttest. Effect size analysis revealed a large effect for interpretation ($d = 0.93$) and a medium effect for expansion ($d = 0.64$), while overall reading comprehension showed a large effect ($d = 1.17$). Detailed statistical results are presented in Table 1.

Table 1 Comparison of Reading Comprehension Ability Before and After the Intervention (n = 22)

Reading Comprehension	Test	Mean	SD	t	p*	Cohen's d** (95% CI)
Interpretation	Pretest	5.27	2.71	-4.360	< .001	0.93 [0.42, 1.43]
	Posttest	7.82	2.46			
Expansion	Pretest	6.28	3.22	-3.010	.007	0.64 [0.18, 1.10]
	Posttest	8.41	2.92			
Overall Reading	Pretest	11.55	4.65	-5.467	< .001	1.17 [0.61, 1.70]
	Posttest	16.23	4.84			

Note. * Statistical significance set at $p < .05$. ** All Cohen's d values reported as positive; CIs reflect absolute magnitude.

Research Question 2: Learning Motivation

The findings also revealed that learners' learning motivation significantly increased after the implementation of CSR integrated with gamification. Both intrinsic and extrinsic motivation levels improved significantly, with intrinsic motivation showing a very large effect size. Detailed results are presented in Table 2.

Table 2 Comparison of Learning Motivation Before and After Using CSR Integrated with Gamification (n = 22)

Motivation	Test	Mean	SD	t	p	Cohen's d (95% CI)
Intrinsic	Pretest	3.34	0.43	-10.453	< .001	2.23 [1.43, 3.01]
	Posttest	4.01	0.24			
Extrinsic	Pretest	3.54	0.59	-4.712	< .001	1.01 [0.48, 1.51]
	Posttest	4.05	0.24			
Overall Reading	Pretest	3.44	0.48	-7.779	< .001	1.66 [1.00, 2.30]
	Posttest	4.03	0.22			

Note. Statistical significance set at $p < .05$.

Discussion

This study aimed to investigate the effects of CSR integrated with gamification on Grade 10 EFL learners' reading comprehension ability and learning motivation. The discussion is organized according to the two research objectives.

Objective 1: Reading comprehension ability

The findings demonstrated that learners' reading comprehension ability significantly improved after participating in learning activities based on CSR integrated with gamification at the .05 level. This improvement can be explained by the structured and strategic nature of CSR, which guides learners through systematic reading processes before, during, and after reading. The use of strategies such as preview, click and clunk, get the gist, and wrap up encouraged learners to actively engage with texts, monitor their understanding, and synthesize key information collaboratively. These processes promoted deeper comprehension rather than surface-level reading, consistent with findings reported by Klingner and Vaughn (1998) and Okkinga et al. (2018).

The collaborative learning component of CSR allowed learners to exchange ideas, clarify misunderstandings, and co-construct meaning within small groups. This finding is consistent with social constructivist theory (Vygotsky, 1978), which emphasizes that learning occurs through social interaction and scaffolding. The integration of gamification further enhanced reading comprehension by increasing learners' engagement and sustained attention during reading activities. Gamified elements such as points, interactive questions, and immediate feedback motivated learners to participate actively throughout the reading process, contributing to their improved reading comprehension.

Objective 2: Learning motivation

The findings revealed that learners' learning motivation significantly increased after the implementation of CSR integrated with gamification. Both intrinsic and extrinsic motivation levels improved, with overall motivation reaching a high level after the intervention. The increase in extrinsic motivation can be attributed to gamification elements such as points, rewards, and group competition, which provided immediate reinforcement and recognition (Deterding et al., 2011). The strong increase in intrinsic motivation is consistent with Self-Determination Theory (Ryan & Deci, 2017), which suggests that intrinsic motivation is enhanced when learners' needs for autonomy, competence, and relatedness are fulfilled. CSR integrated with gamification effectively addressed these needs by promoting cooperative interaction, strategic success experiences, and active learning. The positive and supportive classroom atmosphere further reduced learners' anxiety toward English reading, leading to sustained motivation.

Overall Discussion Summary

In summary, the findings indicate that CSR integrated with gamification effectively improved both learners' reading comprehension ability and learning motivation. The structured use of reading strategies and collaborative learning processes contributed to deeper comprehension, while gamified elements enhanced engagement and motivation. These results support the integration of strategic reading instruction and gamification as an effective approach for English reading at the secondary EFL level.

Originality

This study contributes new empirical knowledge by clarifying the integrated mechanism through which CSR and gamification operate together in secondary EFL reading instruction. Rather than proposing a new theoretical model, the study provides an evidence-based explanation of how motivational reinforcement and structured strategy use function in tandem to improve both reading comprehension and learning motivation.

The findings indicate that significant gains in reading comprehension occurred alongside substantial increases in intrinsic and extrinsic motivation. This parallel development suggests that motivation did not merely improve as a secondary outcome but functioned as an

enabling condition that sustained the repeated application of reading strategies. Gamified elements appeared to stabilize engagement across instructional stages, allowing learners to consistently implement CSR strategies such as previewing, monitoring comprehension, identifying key ideas, and summarizing. Sustained engagement, in turn, supported structured peer interaction, where learners clarified misunderstandings and negotiated textual meaning through defined collaborative roles.

Empirically, the data suggest that reading improvement emerged from the cumulative interaction of three interdependent processes: sustained engagement, repeated strategic processing, and structured peer mediation. These processes collectively facilitated deeper meaning construction rather than surface-level decoding. Furthermore, successful strategy use appeared to reinforce learners' perceived competence, which corresponded with the observed strengthening of intrinsic motivation. This indicates a reciprocal relationship in which motivational reinforcement enabled strategy use, and successful strategy use, in turn, strengthened internalized engagement.

Importantly, the study refines existing understanding by specifying the operational conditions under which gamification supports cognitive development. The findings suggest that gamification contributes to learning not as an isolated reward mechanism, but as a regulatory structure that maintains persistence during cognitively demanding tasks. When aligned with meaningful strategic activities, gamified reinforcement can support longer-term motivational development rather than short-term participation alone.

At the societal and educational levels, the study offers context-specific empirical insights into how secondary EFL instruction can address persistent challenges in reading literacy and learner disengagement. The integrated mechanism identified in this study demonstrates that balanced attention to cognitive scaffolding and motivational stabilization may enhance instructional effectiveness for learners with diverse proficiency levels. These insights inform classroom practice, teacher professional development, and instructional design to strengthen literacy outcomes in knowledge-based educational systems.

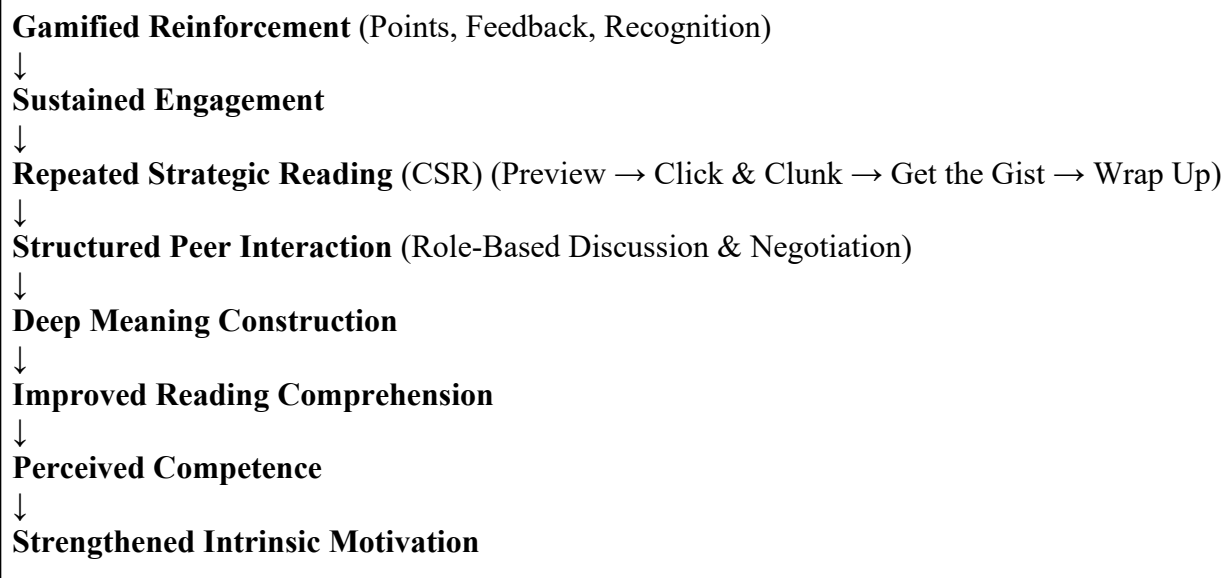


Figure 1 Integrated Cognitive–Motivational Mechanism in CSR–Gamified Reading Instruction

Acknowledgments

This study generates new empirical knowledge concerning the instructional integration of CSR and gamification in secondary-level EFL contexts. Rather than proposing a new theoretical framework, the study provides evidence-based clarification of how specific instructional mechanisms operate in authentic classroom settings and how they simultaneously influence cognitive and motivational processes.

Recommendations for Applying the Research Findings

Based on the findings of this study, several recommendations are proposed for applying the research results in educational practice.

- English teachers should integrate CSR strategies systematically into reading instruction to guide students through pre-reading, while-reading, and post-reading processes, ensuring consistent strategy use and meaningful comprehension development.
- Gamification elements should be carefully designed and aligned with instructional objectives to promote sustained engagement without distracting from learning goals.
- Collaborative learning activities should be structured with clearly defined roles to support peer interaction and effective meaning construction, particularly in classrooms with mixed-ability learners.
- Teachers should receive professional development on integrating strategic reading instruction and gamification to enhance both cognitive and motivational aspects of learning.
- Educational institutions may consider adopting CSR integrated with gamification as an instructional approach for improving reading comprehension and learner engagement in English language programs.

Recommendations for Future Research

To extend the findings of this study, the following recommendations are proposed for future research.

- Future studies may investigate the long-term effects of CSR integrated with gamification on reading comprehension and motivation to examine the sustainability of learning outcomes.
- Further research could explore the effectiveness of this instructional approach across different educational levels, subject areas, or learner proficiency groups.
- Qualitative research methods, such as classroom observations or learner interviews, could be employed to gain deeper insights into students' cognitive and motivational processes during CSR activities.
- Comparative studies may be conducted to examine differences between CSR integrated with gamification and other instructional approaches in English reading instruction.
- Future research could also investigate the impact of specific gamification elements on learners' motivation and strategy use to refine instructional design.

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