The Effects of Game-based Learning Combined with Situational Language Teaching on Chinese Character Literacy of Kindergarteners

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Received: October 21, 2025 Accepted: December 2, 2025 Online Published: December 31, 2025

doi:10.5430/jct.v15n1p81 URL: https://doi.org/10.5430/jct.v15n1p81

Abstract

This study investigated the effects of an integrated pedagogical model, combining game-based learning (GBL) with situational language teaching (SLT), on early childhood Chinese language acquisition. The study aimed to 1) compare learning achievement in Chinese character literacy before and after learning through an integrated pedagogical model and 2) assess the learning motivation of kindergarteners. The study involved 20 children (K2) in Chonburi, Thailand, within a one-group pretest-posttest design. Data were collected using an achievement test and a motivation questionnaire and were analyzed using descriptive statistics and a dependent samples t-test. The results showed the learning achievement in Chinese character literacy was improved at a statistically significant level of 0.05, marked by a very large effect size (Cohen's d = 3.72) and a medium learning gain (N-Gain = 0.55). The learning motivation of kindergarteners was at a high level (Mean = 2.66, S.D. = 0.45), suggesting the integrated approach holds potential as a promising strategy for enhancing both literacy and engagement in young learners.

Keywords: game-based learning, situational language teaching, Chinese character literacy

1. Introduction

Considering the longstanding trade and tourism linkages between Thailand and China, Chinese language education in Thailand has expanded significantly in recent years (Gong & Gao, 2020; Xiao & Tian, 2024). This rapid growth has created an urgent need for effective pedagogical strategies, particularly for young learners facing the unique challenges of Chinese character literacy. In response to the emergent demand for trilingual learners at the preschool level, a considerable number of kindergartens have incorporated Chinese language instruction into their curricula (Xiao & Tian, 2024). Nevertheless, the absence of standardized curricula, together with an insufficient supply of qualified preschool Chinese language educators (Gong et al., 2020; Kittachotworakul, 2023), has produced inconsistencies in instructional practice. Accordingly, kindergartens employ disparate timetables, materials, and pedagogical approaches, resulting in the lack of a uniform framework for assessing student achievement (McDonald & Pang, 2021).

The intrinsic complexity of the Chinese language—encompassing its writing system, phonology, and grammar—further complicates early instruction. For novice learners, Pinyin is typically introduced in conjunction with Chinese characters ("Hanzi"). As a Romanized system that represents Chinese pronunciation, Pinyin is indispensable for non-native learners, providing systematic phonetic guidance (Lin et al., 2020; Wang, 2019). Its application significantly mitigates challenges related to tonal pronunciation and facilitates character recognition (Wang, 2019; Zhang et al., 2020). Empirical research has demonstrated that Pinyin not only assists pronunciation but also enhances reading fluency and literacy development (Tong & Zhang, 2022; Yu & Tsuei, 2022). Consequently, within the Thai kindergarten contexts, Pinyin has attained recognition as an essential pedagogical tool (Yang et al., 2024).

Despite its merits, Chinese literacy acquisition among Thai children remains hindered by profound differences between Chinese characters and the alphabetic systems of Thai and English. The logographic nature of Chinese, necessitating memorization of strokes, radicals, and semantic associations, poses a particularly steep learning curve (Ke et al., 2019; Yin & McBride, 2015). Furthermore, the absence of phonetic cues with character compounds

exacerbates these difficulties (Ke et al., 2019; Yin & McBride, 2015). In practice, many preschool instructors have tended to privilege the development of oral skills over literacy (Gong & Gao, 2020).

The scholarly consensus, however, underscores the critical importance of early literacy for holistic child development. Foundational theories emphasized that early literacy fosters cognitive, social, emotional, and linguistic growth (Erikson, 1963; Gardner, 1983; Piaget, 1952). Within multilingual environments, literacy also functions as a medium of cultural and linguistic transfer. Despite such insights, instruction in many Thai kindergartens remains dominated by rote memorization and repetitive writing methods that frequently fail to capture learner interest and yield suboptimal outcomes (Yu & Tsuei, 2022). Among the principal obstacles for Thai learners are difficulties in tonal accuracy, the arduous process of character memorization, and diminished motivation (Gong et al.,2020). Memorization of logographic characters devoid of phonetic cues presents a significant impediment (Ke et al., 2019). Moreover, the dominance of conventional pedagogy often contributes to motivation decline. Foundational motivational frameworks emphasize the necessity of intrinsic motivation and culturally grounded engagement (Deci & Ryan, 1985; Dörnyei, 2001; Gardner, 1983; Krashen, 1982). In response, contemporary scholarship has advocated for innovative methodologies, notably game-based learning (GBL) (Gee, 2003; Shen et al., 2024) and situational language teaching (SLT) (Richards & Rodgers, 2014), as viable pedagogical alternatives.

Although extant research has underscored the value of innovative pedagogies, empirical investigation within the Thai preschool context remains limited. Previous studies have predominantly emphasized oral proficiency, while the systematic application of integrated methodologies to advance character literacy has been largely overlooked (Hussein et al., 2022). Therefore, the purpose of this study was to 1) evaluate the learning achievement in Chinese character literacy and 2) investigate the learning motivation of kindergarteners following an integrated GBL and SLT intervention.

2. Literature Review

2.1 Game-Based Learning (GBL)

Game-based learning (GBL) is an instructional approach that integrates the mechanics and elements of games, such as rules, challenges, tasks, and rewards, into the learning process to enhance motivation and learner engagement. Rooted in the principles of constructivism and active learning, GBL emphasizes learning through hands-on practice, problem-solving, and decision-making in contexts that closely resemble real-life situations, thereby fostering analytical thinking and sustainable learning outcomes (Gee, 2003; Hamari et al., 2016; Prensky, 2003). Furthermore, the incremental structure of challenges within games aligns with psychological learning theories that highlight reinforcement and intrinsic motivation, enabling learners to experience enjoyment, persistence, and continuous engagement in their learning (Koh & Kim, 2024).

In practice, GBL positions learners at the center of the learning process, while instructors act as facilitators and designers rather than mere transmitters of knowledge. Learners are granted opportunities to determine strategies and make decisions independently, thereby cultivating critical thinking and accountability for their own learning. A substantial body of research confirms that GBL enhances academic achievement, problem-solving skills, and motivation to learn. Particularly in foreign language education, GBL has proven effective in simulating authentic communication scenarios, encouraging learners to use the target language more confidently and naturally (Steinkuehler & Duncan, 2008; Shen et al., 2024).

In conclusion, Game-Based Learning (GBL) represents an instructional approach that enriches the learning process by integrating enjoyment, challenge, and active learner participation with educational objectives. This concept not only fosters motivation but also supports the development of critical thinking, problem-solving abilities, and learner responsibility. Ultimately, it contributes to high-quality and sustainable educational outcomes, making it highly suitable for application in learner-centered instructional contexts.

2.2 Situational Language Teaching (SLT)

Situational Language Teaching (SLT) is grounded in the principles of structuralism and behaviorism, emphasizing that learners can acquire a language more effectively when it is presented through authentic contexts or real-life situations (Richards & Rodgers, 2014). This approach prioritizes language practice in everyday scenarios such as greetings, transactions, and classroom conversations, enabling learners to connect linguistic structures with meaningful communication in a natural manner. SLT is therefore recognized as a systematic and realistic method for enhancing the four core skills of listening, speaking, reading, and writing by situating learning in meaningful contexts (Haryanto, 2022; Vidović, 2024).

Furthermore, SLT fosters learners' confidence and motivation by providing opportunities for interaction and communication in contexts that mirror real-life usage. This facilitates the development of pragmatic competence and sociolinguistic competence, which are essential for effective communication in multicultural societies (Steinkuehler & Duncan, 2008). As a result, SLT not only strengthens learners' theoretical understanding of language structures but also equips them with the ability to apply language appropriately in authentic situations, thereby ensuring meaningful and sustainable language learning (Widiarini, 2022).

In conclusion, Situational Language Teaching (SLT) is a language instruction approach that emphasizes the use of authentic contexts and real-life situations as central tools for teaching and learning. This method enables learners to connect linguistic structures with meaningful communication in a natural manner. It not only enhances the four fundamental skills of listening, speaking, reading, and writing but also fosters learners' confidence and motivation in language learning. Moreover, SLT contributes to the development of pragmatic competence and communicative abilities within multicultural settings. Thus, SLT represents a significant pedagogical approach that advances the quality of language education while ensuring practical applicability and sustainable learning outcomes.

2.3 Learning Achievement in Chinese Character Literacy

Learning achievement in Chinese character literacy refers to learners' ability to accurately recognize, pronounce, write, and interpret Chinese characters with efficient performance. Chinese is a logographic writing system, fundamentally different from alphabetic systems such as Thai and English. Thus, effective learning requires an understanding of the structure of characters, stroke order, radicals, and semantic components (Kanabsak et al., 2023; Ke et al., 2019). Achievements in this domain reflect systematic development of reading and writing skills in Chinese, which serves as a critical foundation that enables learners to progress toward other language skills in a stable and comprehensive manner.

In addition, achievement in Chinese character literacy is directly related to analytical thinking skills and memory capacity, as learners must connect sounds, character forms, and meanings in a complex cognitive process. Research has shown that integrating Pinyin with Chinese characters enhances learners' ability to link phonetic representations with written symbols, thereby improving pronunciation, confidence, and deeper learning outcomes (Wang, 2019). Consequently, fostering learning achievement in Chinese character literacy is vital for establishing a solid and sustainable foundation for Chinese language acquisition.

In conclusion, learning achievement in Chinese character literacy is a crucial indicator of learners' ability to recognize, pronounce, write, and comprehend Chinese characters accurately. Unlike alphabetic languages, Chinese requires structural memorization and the integration of sounds with written forms, making the learning process more complex. Developing achievement in this area not only provides a solid foundation for acquiring additional language skills but also strengthens analytical thinking, confidence, and sustainable competence in the Chinese language.

2.4 Learning Motivation

Learning motivation is an internal force that stimulates, sustains, and reinforces learners' learning behaviors. It can be classified into intrinsic motivation, which arises from learners' interests, satisfaction, and curiosity, and extrinsic motivation, which is driven by external factors such as scores, grades, or rewards (Deci & Ryan, 1985; Gardner, 1985). In the context of foreign language education, motivation is a decisive factor influencing learners' perseverance and consistency in overcoming challenges in the target language. Numerous studies have revealed that learners with higher levels of motivation are more likely to achieve academic success (Fadli et al., 2024). Therefore, the design of learning activities that foster motivation is regarded as a core principle of effective instruction.

Moreover, motivation plays a vital role in fostering engagement and self-regulated learning, which are essential skills in the 21st century. Wen and Yang (2020) demonstrated that higher levels of motivation are positively correlated with the use of deep learning strategies and effective time management, leading to continuous academic progress and goal attainment. Thus, instructional practices that address both intrinsic and extrinsic dimensions of motivation are crucial for ensuring meaningful and sustainable learning outcomes.

In conclusion, learning motivation is a pivotal factor shaping the direction and success of the learning process. It encompasses both intrinsic motivations, arising from learners' curiosity and personal interest, and extrinsic motivation, driven by rewards or external stimuli. Strong motivation enables learners to sustain effort, overcome challenges, and achieve academic goals, while also fostering positive engagement and self-regulated learning. Therefore, cultivating environments and activities that promote both intrinsic and extrinsic motivation is central to ensuring effective and sustainable learning outcomes. According to the literature reviewed above, it can be concluded that game-based learning (GBL), situational language teaching (SLT), learning achievement in Chinese character

literacy, and learning motivation are intrinsically interrelated within the framework of effective language pedagogy.

GBL functions as an instructional paradigm that creates an engaging, participatory learning environment, stimulates motivation, and promotes knowledge acquisition through challenges and problem-solving activities (Gee, 2003; Hamari et al., 2016; Prensky, 2003). In parallel, SLT plays a complementary role by emphasizing language practice within authentic and meaningful contexts (Erikson, 1963; Richards & Rodgers, 2014). Collectively, these two approaches act as mutually reinforcing mechanisms that foster both the affective and cognitive dimensions of learning. Within this conceptual framework, Chinese character literacy represents a critical learning outcome, encapsulating learners' ability to systematically recognize, pronounce, write, and interpret Chinese characters (Wang, 2019; Ke et al., 2019). The integration of Pinyin with character learning further strengthens comprehension and learner confidence, while its effectiveness is amplified when supported by robust motivational factors. Learners with higher levels of both intrinsic and extrinsic motivation are demonstrably more capable of confronting and overcoming the inherent complexities of the logographic system (Deci & Ryan, 1985; Tong & Zhang, 2022; Yu & Tsuei, 2024). Thus, motivation serves as a driving force that sustains perseverance and enables long-term academic success (Dörnyei, 2001; Krashen, 1982). Consequently, GBL and SLT emerge as innovative pedagogical approaches that not only invigorate learner motivation but also provide meaningful communicative contexts, directly contributing to the enhancement of Chinese character literacy achievement. Motivation functions as the essential catalyst that sustains learners' engagement, whereas literacy acquisition constitutes the tangible outcome of integrating these pedagogical strategies. The dynamic interrelationship among these four elements underscores the critical importance of harmonizing instructional innovation, learner engagement, and motivational reinforcement to ensure sustainable and high-quality outcomes in foreign language education.

In summary, game-based learning (GBL), situational language teaching (SLT), learning achievement in Chinese character literacy, and learning motivation are closely interrelated within the domain of effective language pedagogy. GBL and SLT provide innovative frameworks that enrich the learning experience and foster both cognitive and affective growth, while learning motivation serves as the driving force that sustains learner engagement. Together, these elements converge to support the systematic development of Chinese character literacy, ensuring meaningful, practical, and sustainable outcomes in language education.

3. Method

3.1 Population and Sample

The population of this study comprised two classrooms with 40 kindergarten grade 2 (K2) children enrolled in a kindergarten in Chonburi, Thailand, during the 2024–2025 academic year. The sample was drawn using a cluster random sampling technique and consisted of one classroom with 20 children. These participants were selected to represent the target group to assess the effectiveness of the developed instructional intervention.

3.2 Research Instruments

The research instruments were divided into four categories: instructional materials, technology integration, GEGLD instructional model, and assessment tools.

3.2.1 Instructional Materials

The instructional plan explicitly integrated Pinyin as a foundational tool for pronunciation before introducing the characters. Each session began with the teacher introducing the Pinyin sounds and tones for the target characters, ensuring students could accurately pronounce the words before engaging with the logographic forms in the game-based and situational activities. This approach aligns with the pedagogical rationale outlined in the introduction, using Pinyin as a bridge to facilitate character recognition for non-native learners.

The learning management plan was developed by integrating game-based learning (GBL) with situational language Teaching (SLT). The plan consisted of 10 academic hours covering two foundational topics: body parts and animals. These topics were strategically selected because many of their corresponding Chinese characters are pictographs (e.g., 目 for eye, 鱼 for fish), allowing young learners to more easily associate the character's form with its meaning. The specific vocabulary covered was as follows:

Body parts: words such as 头 (head), 手 (hand), 目 (eye), 口 (mouth), 耳朵 (ear); characters including 手, 头, 足, 目, 口, 耳.

Animals: words such as 鱼 (fish), 兔 (rabbit), 龟 (turtle), 马 (horse), 牛 (cow/ox), 羊 (sheep/goat); characters including 鱼, 牛, 马, 兔, 羊, 龟.

The instructional framework was validated by five experts: two Chinese language experts, two curriculum and instruction experts, and one educational measurement expert. The index of item-objective congruence (IOC) ranged between 0.80 and 1.00, indicating strong content validity.

3.2.2 Technology Integration

A key component of the multi-sensory approach involved the use of digital animated videos specifically designed for each target character. These short animations served two primary functions: 1) they visually demonstrated the correct stroke order dynamically and engagingly, and 2) they transformed the abstract character into a memorable, animated story (e.g., showing the character for "fish" (鱼) swimming). This technological element was primarily utilized during Step 2 (Explanation and Situation Simulation) of the GEGLD Model to enhance comprehension before gameplay.

3.2.3 The GEGLD Instructional Model

The synthesis of game-based learning (GBL) and situational language teaching (SLT) created an interactive and immersive language learning experience designed to be more engaging and effective. This integration operated the five-step GEGLD Model, which combines the strengths of both approaches.

Figure 1. The Integrated GBL and SLT Instructional Model (GEGLD Model)

The five steps of the model are defined as follows:

Step 1: Getting engaging and Lead-in: capture students' attention with thought-provoking questions, discussions, or real-life scenarios related to the lesson topic.

Step 2: Explanation and Situation Simulation: explain key language concepts and create a situational context through role-playing, dialogues, or simulations of real-life interactions.

Step 3: Game Implementation and Controlled Practice: introduce games that reinforce language learning within a structured framework, allowing students to practice language skills in a guided and controlled setting.

Step 4: Learning Process Monitoring, Questions and Clarification: observe students' progress, provide necessary clarifications, and address misconceptions by explaining language structures and meanings in depth.

Step 5: Discussion, Evaluation, and Freer Practice: allow students to apply their language skills more freely through discussions, reflections, and real-life applications, while providing constructive feedback for further improvement.

3.2.4 Assessment Tools

A Chinese character literacy achievement test for kindergarten grade 2 students was designed in the form of multiple-choice questions, each with three options. The quality of the test items was assessed in terms of difficulty (0.20–0.80) and discrimination (0.20–1.00). Reliability was confirmed using Cronbach's alpha coefficient, with values above 0.70, thus meeting acceptable standards. A motivation questionnaire was designed to assess the level of motivation among students after the intervention. This questionnaire included items assessing intrinsic motivation, interest in learning, and the perceived enjoyment of the process. Items were rated on the 3-point Likert scale, where 1 indicated a low level, 2 indicated a medium level, and 3 indicated a high level of agreement. Therefore, a mean score of more than 3.0 was interpreted as a high level of motivation. The reliability of the motivation questionnaire was

also confirmed with a Cronbach's alpha coefficient above 0.70, ensuring it was a consistent and valid tool for measuring student motivation.

3.3 Data Collection Methods

The data collection was conducted in three phases: 1 Preparation Phase: The researchers obtained permission from the faculty of technical education, Rajamangala University of Technology Thanyaburi, and coordinated with the director of a kindergarten school in Chonburi to facilitate data collection. 2 Implementation Phase: a pre-test of Chinese character literacy was administered to the sample group, followed by the implementation of the developed learning management plan that integrated GBL with SLT. Upon completion, a post-test was conducted using the same achievement test. Lastly, 3 Follow-up Phase: The collected data were reviewed for completeness, and feedback from teachers and observers was documented to ensure reliability of the intervention process.

3.4 Data Analysis

The data analysis was conducted systematically to evaluate the effectiveness of the intervention. The following procedures were employed in the research instrument quality analysis. Index of item objective congruence (IOC) validated content consistency of the instruments, with an acceptable threshold of ≥0.50. Cronbach's alpha coefficient was calculated to determine reliability, with values ≥0.70 indicating sufficient internal consistency.

4. Results

4.1 Effects of the GEGLD Model on Chinese Character Literacy Achievement

The comparison results on learning achievement in Chinese character literacy before and after learning through the GEGLD instructional model, the integrated approach combining game-based learning (GBL) and situational language teaching (SLT). The results showed that the learning achievement in Chinese character literacy was improved at a statistically significant level of 0.05, as shown in Table 1.

Table 1. Comparison Results of the Learning Achievement in Chinese Character Literacy of Kindergarteners before and after the Implementation of Learning Management Through Game-Based Learning Combined with Situational Language Teaching

Test	n	Mean	S.D.	*t*	(df)	*p*	Cohen's D	N Gain(g)
before	20	3.40	1.405					
after	20	7.05	1.638	16.653*	19	0.000	3.72	0.55

*p<.05

From Table 1, the comparison of learning achievement in Chinese character literacy revealed a marked improvement after learning through the GEGLD instructional model, the integrated approach combining game-based learning (GBL) and situational language teaching (SLT). The mean score increased significantly from a pre-test of 3.40 (S.D.=1.405) to a post-test of 7.05 (S.D.=1.638), with 85% of kindergarteners scoring above the passing criterion after learning. A paired-samples t-test confirmed this improvement was statistically significant, t (19) =16.653, p<.001. To further quantify the magnitude of this enhancement, the effect size was calculated, yielding a Cohen's d of 3.72, which indicates a very large effect. From a pedagogical standpoint, the normalized gain (N-Gain) score was 0.55, representing a medium gain in learning. These results collectively suggest that the integrated instructional approach had a substantial and practically significant impact on enhancing kindergarteners' Chinese character literacy.

4.2 Learning Motivation of Kindergarteners

Learning motivation of kindergarteners after learning through the GEGLD instructional model. The results showed that kindergarteners' learning motivations toward learning Chinese characters through games were overall at a high level, as shown in Table 2.

Table 2. The Learning Motivation of K2 Kindergartens after the Implementation of Learning Management Through Game-Based Learning, Combined with Situational Language Teaching

Item	Mean	S.D.	Meaning
1. Do you like Chinese class?	2.75	0.44	High
2. Do you like playing Chinese character games?	2.75	0.44	High
3. Do you feel happy when learning Chinese characters?	2.65	0.49	High
4. Do you listen carefully when the teacher teaches new characters?	2.70	0.47	High
5. Do you try to finish the game tasks?	2.65	0.49	High
6. If you don't know how to do it, will you try again?	2.80	0.41	High
7. Do you think you can learn many Chinese characters?	2.80	0.41	High
8. Do you want to tell your parents what Chinese characters you learned today?	2.60	0.60	High
9. Do you want to play Chinese character games again next time?	2.70	0.57	High
Total	**2.66**	**0.45**	**High**

From Table 2. The results showed that kindergarteners' learning motivations toward learning Chinese characters through games were overall at a high level (mean 2.66, S.D. = 0.45). The highest mean scores were found in the item of effort when facing difficulties and confidence in learning many characters (mean 2.80, S.D. = 0.41), followed by enjoyment of Chinese class and playing character games (mean 2.75, S.D. = 0.44). The lowest mean score was in the willingness to tell parents about the characters learned (mean 2.60, S.D. = 0.60), which was still interpreted as high. Overall, the findings indicated that the game-based learning approach fostered students' enjoyment, motivation, and active engagement in learning Chinese characters.

5. Discussion

5.1 Comparing the Learning Achievement in Chinese Character Literacy of Kindergartens (K2) before and after the Implementation of Learning Management Through Game-Based Learning Combined with Situational Language Teaching.

The research findings, which revealed a statistically significant improvement with a very large effect size, suggest that the integrated pedagogical model is a promising strategy for enhancing Chinese character literacy among kindergarteners. This improvement appears to be primarily attributed to the GEGLD Model's deep alignments with the cognitive characteristics of children in Piaget's Preoperational Stage (ages 2-7). At this stage, children are highly egocentric, engage in symbolic thought, and learn best through play and hands-on interaction. The GEGLD Model appears to leverage these developmental traits effectively.

The model's initial steps, Step 1 (Getting engaging and Lead-in) and Step 2 (Explanation and Situation Simulation), directly cater to the symbolic function characteristic of this stage. By using stories and role-playing, the model transforms abstract Chinese characters into concrete, meaningful symbols. This process turns learning from rote memorization into imaginative play, the primary mode of learning for preoperational children. This finding appears to align with research indicating that task-based SLT instruction can significantly enhance students' contextual understanding and communication skills (Krashen, 1982). Step 3 (Game Implementation and Controlled Practice) capitalizes on the child's natural inclination to learn through structured play. The clear rules of the games provide a framework that helps children overcome the tendency to focus on only one aspect of a problem. Interactive activities, such as puzzles and group competitions, likely stimulated key cognitive processes crucial for retaining complex information like Chinese characters (Shen et al., 2024). This is reinforced by research demonstrating that digital game-based learning helps preschoolers develop literacy skills through repeated practice and immediate feedback (Koh & Kim, 2024; Prensky, 2003; Steinkuehler & Duncan, 2008). Furthermore, Step 4 (Learning Process Monitoring, questions and Clarification) serves as a critical scaffolding mechanism. The teacher's role in providing clarifications helps bridge the gap between a child's intuitive understanding and more structured knowledge.

Finally, Step 5 (Discussion evaluation and Freer Practice) encourages children to apply their new knowledge in creative and collaborative contexts, which may help mitigate egocentrism by allowing them to share experiences. Moreover, the social and collaborative nature of the Situational Language Teaching (SLT) component plays a pivotal role in cognitive development, specifically in addressing the egocentrism characteristic of the Preoperational Stage.

Piaget posited that children in this stage often struggle to view situations from perspectives other than their own. The GEGLD Model directly addresses this cognitive challenge through structured role-playing and communicative scenarios inherent in SLT. By assuming specific roles—such as acting as a shopkeeper or a customer in a simulated market—and engaging in goal-oriented dialogues with peers, learners are compelled to step outside their own immediate experience to anticipate and respond to the actions of others. This requirement for social reciprocity acts as a powerful cognitive catalyst, encouraging children to 'decenter' and practice perspective-taking. Thus, the inclusion of SLT does not merely provide a linguistic context; it serves as a mechanism for social scaffolding that helps bridge the gap between egocentric speech and socialized communication, thereby deepening the meaningful internalization of the target Chinese characters. Using situational teaching methods in preschool that are consistent with children's cognitive development may help them gain authentic experiences, thereby increasing their enthusiasm for learning and making it easier to consolidate the characters they have learned (Huang, 2023).

Specifically, qualitative observations indicated that distinct components of the intervention targeted different aspects of literacy. The digitally animated videos, which visualized stroke order through dynamic storytelling, were instrumental in aiding character recognition and stroke memorization. Conversely, the SLT-based role-playing activities were critical for establishing semantic meaning and retention. This suggests that while GBL mechanics drove engagement, the situational context provided the necessary cognitive anchor for understanding.

5.2 The Motivation of K2 Kindergarteners after the Implementation of Learning Management Through Game-Based Learning Combined with Situational Language Teaching

The results also indicate that after receiving learning management through the blended approach, the learning motivation of kindergarteners increased, especially in learning and memorizing Chinese characters. This is likely a result of the student-centered and interactive nature of this approach. Game-based learning attracts children's natural preference for play and challenge. By making lessons enjoyable and engaging—with clear objectives, instant feedback, and a sense of achievement—it aligns with the concept that digital-native learners are often motivated by tasks that combine game logic and challenge (Prensky, 2003). These principles are supported by findings that game-based learning methods help stimulate the minds of preschool children by effectively combining play and learning goals (Wen & Yang, 2020). For the context of Chinese character learning, it has been reported that kindergarten students taught with game-based methods displayed increased enthusiasm and participation, which may lead to better retention of academic content (Kanabsak et al., 2023).

At the same time, the situational language teaching creates authentic and meaningful contexts, which may help children understand the importance of the language they are learning. This method could help students participate, reduce anxiety, and increase confidence in interacting with teachers and peers. This possibility aligns with research that found that mobile-based situational games may help develop the listening and speaking skills of young learners while maintaining motivation (Fadli et al., 2024). Additionally, it has been emphasized that situational teaching helps promote enjoyment and active participation in preschool children (Steinkuehler & Duncan, 2008). From classroom observation, it was found that the children paid attention and actively participated in activities. This is a clear indication of increased motivation. Overall, the combination of game-based learning and situational language teaching seems to create a lively and inspiring learning environment, which may promote the language development and personal growth of children.

6. Limitation

This study should be interpreted considering several key limitations. Firstly, the reliance on a one-group pretest-posttest design without a control group prevents the establishment of a definitive causal relationship between the intervention and the observed improvements. Secondly, the sample size was small (N=20) and drawn from a single kindergarten, which limits the generalizability of the findings to broader demographics. Thirdly, this study focused on immediate learning outcomes; the lack of longitudinal data means that the long-term retention of Chinese character literacy and the sustainability of student motivation remain unverified. Finally, it is important to note that the remarkably high effect size reported (Cohen's d = 3.72) should be interpreted with caution. In studies involving novice learners, such high values can be inflated by the low baseline proficiency (floor effect) and uncontrolled confounding variables. Therefore, these results should be viewed as preliminary indicators of potential efficacy rather than conclusive proof.

7. Conclusion

The findings from this study suggest that combining game-based learning (GBL) with situational language teaching

(SLT) holds significant potential as a promising strategy for enhancing Chinese character literacy, demonstrating a practically significant impact and a medium learning gain for K2 kindergarteners. The findings highlight that GBL fosters engagement, persistence, and enjoyment through play-based challenges, while SLT provides authentic contexts that deepen comprehension and promote the meaningful application of language. Moreover, these methods create a dynamic, learner-centered environment that supports cognitive development, emotional involvement, and sustained motivation.

In addition, the study demonstrates that a carefully structured integration of innovative instructional strategies not only improves immediate academic performance but also nurtures positive attitudes toward language learning at an early stage. By stimulating curiosity, reducing anxiety, and fostering confidence, the combined use of GBL and SLT offers sustainable benefits that extend beyond literacy achievement. This integrated approach may serve as a viable model for other contexts in early childhood education, contributing to the development of effective, inclusive, and engaging language learning practices.

However, as a pilot study with a one-group pretest-posttest design, the results should be interpreted as preliminary indicators of efficacy rather than definitive proof of causality. To validate these promising findings and establish a clearer, replicable causal relationship, future research must employ a more robust methodological design, specifically a quasi-experimental design with a control group. Furthermore, longitudinal studies are strongly recommended to assess the long-term retention of character literacy beyond the immediate intervention period. Finally, future investigations should explore the scalability of the GEGLD Model by applying it to broader demographics, potentially extending to primary school levels, to determine its versatility across different developmental stages.

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Acknowledgments

The authors wish to express their sincere gratitude to Pongsathorn Kittachotworakul (D.A.), an expert in early childhood Chinese language curriculum, for his invaluable insights and guidance regarding the instructional design. We are also deeply indebted to the professors and the academic community of the Master of Education program in Curriculum and Learning Management Innovation at Rajamangala University of Technology Thanyaburi. This research would not have been possible without the scholarly environment fostered within the program, which encouraged rigorous inquiry and intellectual growth."

Authors contributions

Not applicable.

Funding

Not applicable.

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 Sciedu Press.

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.