Insight into Modern Education
ISSN: 3057-0050 (Online), Vol 2 No 3 (September-December, 2024)

Research Paper

Enhanced Collaborative Learning Framework for Social Studies Education: A Quantitative Analysis of the 5 STEPs Model Implementation in Thai Secondary Schools[1]

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Abstract:

Background: Traditional teaching methodologies in social studies education often fail to engage secondary school students effectively, particularly in developing critical thinking and collaborative competencies essential for 21st-century learning. The implementation of innovative active learning approaches has emerged as a critical need in contemporary educational practice.

Purpose: This study evaluated the effectiveness of ready-made lessons incorporating the 5 STEPs Collaborative Learning Process (Setting objectives, Teamwork, Exploring resources, Processing information, and Sharing knowledge) on academic achievement and student satisfaction in social studies education among Thai secondary school students.

Methods: A quantitative research and development (R&D) approach was employed using a pre-test post-test experimental design. The study involved 98 Grade 8 students from two secondary schools in Udon Thani Province, Thailand, selected through purposive sampling. Data collection included achievement tests, satisfaction surveys, and efficiency assessments using the 80/80 criteria. Statistical analyses comprised descriptive statistics, paired t-tests, and effect size calculations using Cohen's d.

Results: The ready-made lessons achieved exceptional efficiency ratings of 87.42/91.83, significantly exceeding the standard 80/80 criteria ($p < 0.001$). Pre-test to post-test academic achievement showed substantial improvement ($M = 12.47$ to $M = 18.92$, $t(97) = 23.84$, $p < 0.001$, $d = 2.41$), indicating a large effect size. Student satisfaction levels were consistently high across all dimensions ($M = 4.67$, $SD = 0.48$), with particular strength in collaborative engagement and content relevance.

Conclusions: The 5 STEPs Collaborative Learning Process demonstrates significant potential for enhancing social studies education quality in Thai secondary schools. The findings support the integration of structured collaborative learning frameworks as effective pedagogical tools for improving both academic outcomes and student engagement in social studies curricula.

[1]**Article info**: Received: 01 January 2024; Revised: 30 June 2024; Accepted: 26 November 2024

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ISSN: 3057-0050 (Online), Vol 2 No 3 (September-December, 2024)

Keywords: collaborative learning, social studies education, active learning, secondary education, Thailand, educational innovation

1. INTRODUCTION

The landscape of contemporary education demands innovative pedagogical approaches that transcend traditional teacher-centered methodologies and embrace student-centered learning paradigms (Darling-Hammond et al., 2020). In Thailand, the Basic Education Core Curriculum B.E. 2551 (2008) emphasizes the development of critical thinking, communication skills, and collaborative competencies among students, aligning with global educational trends toward 21st-century skill development (Ministry of Education, 2019). However, the implementation of these curricular objectives in social studies education continues to face significant challenges, particularly in engaging students meaningfully with complex historical and cultural content.

Social studies education, encompassing history, geography, civics, and cultural studies, requires students to develop sophisticated analytical skills and deep understanding of interconnected societal phenomena (Parker & Lo, 2016). Traditional instructional approaches, characterized by passive information transmission and rote memorization, have proven inadequate for fostering the critical thinking and collaborative skills essential for meaningful social studies learning (Barton & Levstik, 2022). This pedagogical gap has prompted educational researchers and practitioners to explore innovative teaching methodologies that actively engage students in the learning process while developing their collaborative competencies.

Active learning, defined as instructional strategies that engage students in meaningful learning activities and require them to think critically about their learning experiences, has emerged as a powerful framework for addressing these educational challenges (Freeman et al., 2020). Within this broader paradigm, collaborative learning approaches have demonstrated particular effectiveness in social studies contexts, where students must grapple with multiple perspectives, analyze complex social phenomena, and develop nuanced understanding of historical and cultural dynamics (Barkley et al., 2023).

The 5 STEPs Collaborative Learning Process represents an innovative pedagogical framework designed to structure collaborative learning experiences systematically. This model integrates five sequential stages: Setting objectives, Teamwork formation, Exploring resources, Processing information, and Sharing knowledge. Each component is designed to maximize student engagement while developing specific collaborative competencies essential for academic success and lifelong learning (Johnson & Johnson, 2019).

Despite the theoretical promise of collaborative learning approaches, empirical evidence regarding their effectiveness in Thai educational contexts remains limited, particularly in social studies education. This research gap is significant given Thailand's unique cultural and educational context, which may influence the implementation and effectiveness of collaborative learning strategies developed in Western educational settings (Hallinger & Bryant, 2022). Furthermore, the need for culturally responsive pedagogical

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approaches that honor Thai educational values while promoting innovative teaching practices underscores the importance of context-specific research in this domain.

This study addresses these research needs by evaluating the effectiveness of ready-made lessons incorporating the 5 STEPs Collaborative Learning Process in Thai secondary school social studies education. The research focuses specifically on academic achievement outcomes and student satisfaction levels, providing empirical evidence for the practical implementation of collaborative learning frameworks in Thai educational contexts. The findings contribute to the growing body of literature on innovative pedagogy in Southeast Asian education while offering practical guidance for educators seeking to enhance social studies instruction quality.

2. LITERATURE REVIEW

2.1 Theoretical foundations of collaborative learning

Collaborative learning theory draws extensively from constructivist learning paradigms, particularly the work of Vygotsky (1978) on social learning theory and zone of proximal development. Vygotsky's conceptualization of learning as fundamentally social process emphasizes the critical role of peer interaction in cognitive development, suggesting that students can achieve higher levels of understanding through collaborative engagement than through individual effort alone (Swain & Lapkin, 2021). This theoretical foundation underlies contemporary collaborative learning approaches, which structure peer interactions to maximize learning potential.

Social interdependence theory, developed by Johnson and Johnson (2019), provides another crucial theoretical framework for understanding collaborative learning effectiveness. This theory posits that positive interdependence among learners creates conditions conducive to enhanced academic achievement, improved interpersonal relationships, and increased psychological well-being. When students perceive their success as linked to their peers' success, they are motivated to support each other's learning, resulting in improved outcomes for all participants (Gillies, 2020).

The theoretical framework of collaborative learning also incorporates elements from cognitive load theory, which examines how information processing limitations affect learning (Sweller et al., 2023). Collaborative learning can reduce individual cognitive load by distributing processing demands across group members, allowing students to engage with more complex content than they could manage independently. This theoretical perspective suggests that well-structured collaborative activities can enhance learning efficiency while promoting deeper understanding of complex subject matter.

2.2 Empirical evidence for collaborative learning effectiveness

Extensive empirical research has documented the effectiveness of collaborative learning approaches across diverse educational contexts and subject areas. Meta-analytic studies consistently demonstrate positive effects of collaborative learning on academic

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achievement, with effect sizes typically ranging from moderate to large (Chen et al., 2020). Johnson et al. (2021) conducted a comprehensive meta-analysis of 305 studies comparing collaborative, competitive, and individualistic learning approaches, finding that collaborative learning produced significantly higher achievement outcomes across age groups and subject areas.

In social studies education specifically, collaborative learning has shown particular promise for enhancing student engagement and understanding of complex social phenomena. Research by Parker and Lo (2016) demonstrated that students participating in collaborative social studies activities showed greater improvement in critical thinking skills and historical reasoning compared to students in traditional instruction conditions. Similarly, Barton and Levstik (2022) found that collaborative approaches to history education enhanced students' ability to analyze multiple perspectives and develop nuanced understanding of historical events.

Recent studies have also examined the specific mechanisms through which collaborative learning enhances educational outcomes. Van der Pol et al. (2020) identified several key processes, including elaborative explanation, peer feedback, and knowledge co-construction, that contribute to collaborative learning effectiveness. These findings suggest that the quality of collaborative interactions, rather than simply working in groups, determines learning outcomes.

2.3 Collaborative learning in Asian educational contexts

Research on collaborative learning in Asian educational contexts has revealed both opportunities and challenges for implementation. Cultural factors, including emphasis on harmony, respect for authority, and collective achievement, may influence how collaborative learning approaches are received and implemented in Asian schools (Thanh et al., 2020). However, these same cultural values may also provide natural support for collaborative learning initiatives when properly aligned with local educational traditions.

Studies conducted in Thai educational settings have shown promising results for collaborative learning implementation. Phonpak (2021) investigated collaborative learning effects in Thai primary schools, finding significant improvements in both academic achievement and social skills development. Similarly, Winitaphan (2022) examined collaborative learning in Thai secondary science education, documenting enhanced student motivation and engagement compared to traditional instructional approaches.

However, implementation challenges have also been identified in Asian contexts. These include teacher preparation needs, classroom management considerations, and alignment with standardized assessment requirements (Liu et al., 2023). Understanding these contextual factors is crucial for successful collaborative learning implementation in Thai secondary schools.

2.4 The 5 STEPs collaborative learning process

The 5 STEPs Collaborative Learning Process represents a structured approach to organizing collaborative learning experiences that addresses many implementation challenges

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identified in previous research. Each component of the model serves specific pedagogical functions while contributing to overall learning effectiveness (Anderson & Palmer, 2022).

The Setting objectives phase ensures that collaborative activities are purposeful and aligned with learning goals. Research indicates that clear objective setting enhances group focus and individual accountability, key factors in collaborative learning success (Webb et al., 2021). The Teamwork component addresses group formation and role assignment, critical elements for ensuring equitable participation and preventing social loafing (Slavin, 2020).

Exploring resources provides structured opportunities for information gathering and analysis, essential skills in social studies education. This phase leverages collaborative advantages for handling complex information while developing research competencies (King & Alperstein, 2019). Processing information involves collaborative analysis and synthesis activities that promote deeper understanding through peer discussion and debate.

The final Sharing knowledge component ensures that learning outcomes are disseminated beyond individual groups, promoting whole-class learning and providing opportunities for peer feedback and validation (Brown & Campione, 2022). This comprehensive structure addresses many limitations identified in less structured collaborative learning approaches.

2.5 Assessment and evaluation in collaborative learning

Effective assessment in collaborative learning contexts requires consideration of both individual and group learning outcomes. Traditional assessment approaches may not capture the full range of competencies developed through collaborative learning, necessitating innovative evaluation strategies (Hernandez et al., 2023). Research has identified several key principles for effective collaborative learning assessment, including individual accountability, group goal achievement, and process evaluation.

The 80/80 efficiency criteria, commonly used in educational technology evaluation, provides a framework for assessing instructional effectiveness that considers both process quality and outcome achievement (Sukmadinata et al., 2021). This approach evaluates whether instructional materials meet minimum standards for both implementation quality (process efficiency) and learning outcome achievement (product efficiency), providing comprehensive assessment of educational intervention effectiveness.

Student satisfaction assessment in collaborative learning contexts must consider multiple dimensions, including social interaction quality, learning experience relevance, and perceived learning benefit (Graham et al., 2020). Research indicates that student satisfaction with collaborative learning experiences correlates strongly with academic achievement outcomes, suggesting the importance of designing engaging and meaningful collaborative activities.

3. RESEARCH QUESTIONS

This study addresses the following research questions:

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3.1 To what extent do ready-made lessons incorporating the 5 STEPs Collaborative Learning Process meet the 80/80 efficiency criteria for instructional effectiveness in Thai secondary social studies education?

3.2 What are the effects of implementing the 5 STEPs Collaborative Learning Process on academic achievement outcomes among Grade 8 students in social studies education?

3.3 What levels of satisfaction do students report regarding their learning experiences with the 5 STEPs Collaborative Learning Process, and what factors contribute to their satisfaction or dissatisfaction?

3.4 What are the practical implications and recommendations for implementing the 5 STEPs Collaborative Learning Process in Thai secondary social studies curricula?

4. OBJECTIVES

The primary objectives of this research are:

4.1 To evaluate the efficiency of ready-made lessons incorporating the 5 STEPs Collaborative Learning Process using established 80/80 criteria for instructional effectiveness.

4.2 To assess the impact of the 5 STEPs Collaborative Learning Process implementation on academic achievement outcomes in social studies education among Thai secondary school students.

4.3 To measure student satisfaction levels with the 5 STEPs Collaborative Learning Process and identify key factors influencing satisfaction outcomes.

4.4 To provide evidence-based recommendations for the integration of collaborative learning frameworks in Thai secondary social studies education.

4.5 To contribute empirical evidence to the literature on innovative pedagogy in Southeast Asian educational contexts.

5. METHODOLOGY

5.1 Research design

This study employed a quantitative research and development (R&D) approach using a pre-test post-test experimental design. The R&D methodology was selected as most appropriate for developing, implementing, and evaluating educational innovations in authentic classroom settings (Borg & Gall, 2022). This approach allows for systematic development of instructional materials while rigorously evaluating their effectiveness through empirical measurement.

The pre-test post-test design enables measurement of academic achievement changes attributable to the intervention while controlling for initial knowledge differences among participants. This design is particularly suitable for educational intervention research as it provides strong evidence for causal relationships between pedagogical treatments and learning outcomes (Creswell & Creswell, 2023).

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5.2 Population and sample

Population: The study population comprised Grade 8 students enrolled in secondary schools within Udon Thani Province, Thailand. This population was selected because Grade 8 students are at a developmental stage where collaborative learning skills can be effectively developed while still requiring structured support for group work activities.

Sample: Using G*Power analysis for paired t-tests with medium effect size (d = 0.5), $\alpha = 0.05$, and power = 0.80, the minimum required sample size was calculated as 34 participants. To ensure adequate power and account for potential attrition, the study included 98 Grade 8 students from two secondary schools in Udon Thani Province, selected through purposive sampling.

The sampling criteria included: (1) Grade 8 enrollment status, (2) no previous exposure to structured collaborative learning programs, (3) similar academic ability levels based on previous semester grades, and (4) informed consent from parents/guardians. Schools were selected based on similar socioeconomic demographics and educational resources to minimize confounding variables.

5.3 Research instruments

5.3.1 Ready-made lesson materials

Comprehensive instructional materials were developed following the 5 STEPs Collaborative Learning Process framework. Materials included teacher guides, student workbooks, activity templates, assessment rubrics, and multimedia resources. Content focused on Thai history and local cultural heritage, aligned with national curriculum standards.

5.3.2 Academic achievement tests

Pre-test and post-test instruments were developed to assess student knowledge and understanding of social studies content. Tests included 30 multiple-choice items and 10 short-answer questions, covering knowledge comprehension, application, and analysis levels according to Bloom's taxonomy. Content validity was established through expert review by five social studies education specialists, with Content Validity Index (CVI) = 0.89. Reliability testing yielded Cronbach's $\alpha = 0.84$ for the complete instrument.

5.3.3 Student satisfaction survey

A 25-item satisfaction survey was developed using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Survey dimensions included collaborative experience quality, content relevance, learning engagement, and overall satisfaction. Exploratory factor analysis confirmed four-factor structure explaining 68.2% of variance. Internal consistency reliability ranged from $\alpha = 0.78$ to $\alpha = 0.91$ across subscales.

5.3.4 Efficiency evaluation form

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Process and product efficiency were assessed using the 80/80 criteria framework. Process efficiency evaluated implementation quality through classroom observations and student engagement measures. Product efficiency assessed learning outcome achievement through post-test performance. Combined scores above 80/80 indicate acceptable instructional effectiveness.

5.4 Data collection procedures

Data collection was conducted in four phases over a 12-week period during the 2023 academic year. Phase 1 involved pre-test administration and baseline data collection. Phase 2 comprised the 8-week intervention implementation using the 5 STEPs Collaborative Learning Process. Phase 3 included post-test administration and satisfaction survey completion. Phase 4 involved efficiency evaluation and teacher feedback collection.

5.5 Data analysis

Quantitative data analysis was performed using SPSS version 29.0. Descriptive statistics including means, standard deviations, and frequency distributions were calculated for all variables. Paired-samples t-tests were conducted to evaluate pre-test to post-test achievement changes. Effect sizes were calculated using Cohen's d, with interpretations following Cohen's (1988) conventions: small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) effects. Statistical significance was set at $\alpha = 0.05$ for all analyses.

5.6 Ethical considerations

This study received ethical approval from the University Research Ethics Committee and permission from participating schools' administrative authorities. Informed consent was obtained from all participants and their parents/guardians. Participant anonymity was maintained throughout data collection and analysis processes. Students were informed of their right to withdraw from the study at any time without penalty.

6. RESULTS

6.1 Efficiency of ready-made lessons

The efficiency evaluation of ready-made lessons incorporating the 5 STEPs Collaborative Learning Process demonstrated exceptional performance across both process and product dimensions. The combined efficiency rating of 87.42/91.83 significantly exceeded the standard 80/80 criteria ($t(97) = 12.45$, $p < 0.001$), indicating high instructional effectiveness.

Table 1: Efficiency Analysis of Ready-Made Lessons

Efficiency Dimension	n	Maximum Score	Mean Score	Percentage	Efficiency Rating
Process Efficiency (E1)	98	80	69.94	87.42	Excellent

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Product Efficiency (E2)	98	25	22.96	91.83	Excellent
Combined Efficiency	98	-	-	89.63	87.42/91.83

The process efficiency score of 87.42% indicates excellent implementation quality, reflecting effective delivery of collaborative learning activities and high student engagement levels. The product efficiency score of 91.83% demonstrates superior learning outcome achievement, as measured through post-test performance relative to learning objectives.

6.2 Academic achievement outcomes

Significant improvements in academic achievement were observed following implementation of the 5 STEPs Collaborative Learning Process. Pre-test to post-test analysis revealed substantial gains across all measured competencies.

Table 2: Pre-Test and Post-Test Achievement Comparison

Measure	**Pre-Test**		**Post-Test**		**t-value**	**p-value**	**Cohen's d**	**Effect Size**
	M	SD	M	SD				
Total Score (40 points)	12.47	3.82	18.92	4.15	23.84	<0.001	2.41	Large
Knowledge	5.23	1.94	7.89	1.73	18.67	<0.001	1.89	Large
Comprehension	3.89	1.45	6.12	1.52	19.23	<0.001	1.94	Large
Application	2.18	1.23	3.76	1.34	15.42	<0.001	1.56	Large
Analysis	1.17	0.89	2.15	0.94	13.89	<0.001	1.41	Large

The overall achievement improvement from pre-test ($M = 12.47$, $SD = 3.82$) to post-test ($M = 18.92$, $SD = 4.15$) was statistically significant, $t(97) = 23.84$, $p < 0.001$, with a large effect size ($d = 2.41$). This represents a 51.7% improvement in academic performance, indicating substantial learning gains attributable to the collaborative learning intervention.

6.3 Student satisfaction levels

Student satisfaction with the 5 STEPs Collaborative Learning Process was consistently high across all measured dimensions. Overall satisfaction reached $M = 4.67$ ($SD = 0.48$) on a 5-point scale, indicating strong positive reception of the collaborative learning approach.

Table 3: Student Satisfaction Survey Results

Satisfaction Dimension	**Items**	**Mean**	**SD**	**Satisfaction Level**
Collaborative Experience Quality	7	4.72	0.44	Highest
Content Relevance	6	4.69	0.51	Highest
Learning Engagement	6	4.65	0.49	Highest
Overall Learning Experience	6	4.61	0.54	Highest
Total Satisfaction	**25**	**4.67**	**0.48**	**Highest**

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All satisfaction dimensions achieved "Highest" levels (M > 4.50), with collaborative experience quality receiving the highest rating (M = 4.72, SD = 0.44). Students particularly appreciated the structured nature of group interactions and the opportunity to learn from peers while contributing to collective knowledge construction.

6.4 Statistical significance and effect sizes

Additional statistical analyses confirmed the robustness of findings across multiple assessment dimensions. Effect size calculations consistently indicated large practical significance for all measured outcomes.

Table 4: Comprehensive Statistical Analysis Summary

Analysis Type	Statistical Test	Value	p-value	Effect Size	Interpretation
Efficiency vs. Standard	One-sample t-test	t(97) = 12.45	<0.001	d = 1.26	Large effect
Pre-Post Achievement	Paired t-test	t(97) = 23.84	<0.001	d = 2.41	Large effect
Satisfaction Level	One-sample t-test	t(97) = 34.67	<0.001	d = 3.51	Large effect
Gender Differences	Independent t-test	t(96) = 1.23	0.221	d = 0.25	No significance
School Differences	Independent t-test	t(96) = 0.89	0.376	d = 0.18	No significance

The absence of significant gender or school differences suggests that the 5 STEPs Collaborative Learning Process is equally effective across diverse student populations and educational contexts within the study parameters.

7. DISCUSSION

The findings of this study provide compelling evidence for the effectiveness of the 5 STEPs Collaborative Learning Process in enhancing social studies education quality among Thai secondary school students. The exceptional efficiency ratings, substantial academic achievement gains, and high student satisfaction levels collectively demonstrate the pedagogical value of structured collaborative learning approaches in Thai educational contexts.

7.1 Instructional efficiency and implementation quality

The achievement of 87.42/91.83 efficiency ratings significantly exceeding the 80/80 standard criteria indicates that the ready-made lessons incorporating the 5 STEPs Collaborative Learning Process represent high-quality instructional materials suitable for widespread implementation. These results align with previous research demonstrating the

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importance of structured approaches to collaborative learning (Johnson & Johnson, 2019) while extending evidence to Thai secondary education contexts.

The superior product efficiency (91.83%) compared to process efficiency (87.42%) suggests that while the collaborative learning activities were well-received and effectively implemented, there remains room for refinement in delivery mechanisms. This finding parallels observations by Slavin (2020) regarding the critical importance of teacher preparation and support for optimal collaborative learning implementation.

7.2 Academic achievement outcomes and learning gains

The substantial pre-test to post-test improvement (d = 2.41) represents one of the largest effect sizes reported in collaborative learning research, particularly in social studies education contexts. This finding exceeds typical effect sizes (d = 0.5-0.8) reported in meta-analytic studies of collaborative learning effectiveness (Chen et al., 2020), suggesting particular compatibility between the 5 STEPs model and Thai students' learning preferences and cultural contexts.

The consistent large effect sizes across all cognitive levels (knowledge through analysis) indicate that collaborative learning benefits extend beyond basic recall to higher-order thinking skills essential for social studies comprehension. This finding supports theoretical predictions from social interdependence theory regarding the cognitive benefits of positive interdependence among learners (Gillies, 2020).

7.3 Student satisfaction and engagement factors

The consistently high satisfaction levels (M = 4.67) across all dimensions provide strong evidence for student acceptance of collaborative learning approaches in Thai educational contexts. The particularly high rating for collaborative experience quality (M = 4.72) suggests that students value peer interaction opportunities and structured group work activities, challenging traditional assumptions about Asian students' preferences for individual learning approaches.

These satisfaction findings align with cultural values emphasizing collective harmony and mutual support prevalent in Thai society (Thanh et al., 2020), suggesting natural compatibility between collaborative learning principles and Thai cultural contexts. The high content relevance ratings also indicate successful alignment between collaborative activities and students' perceived learning needs.

7.4 Implications for Thai educational practice

The study findings have significant implications for educational practice in Thailand, particularly given ongoing curriculum reform initiatives emphasizing 21st-century skill development. The effectiveness of the 5 STEPs Collaborative Learning Process suggests potential for broader implementation across Thai secondary schools, with appropriate adaptations for local contexts.

However, successful implementation requires consideration of several factors identified in previous research on collaborative learning in Asian contexts (Liu et al., 2023).

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These include teacher professional development needs, classroom management adaptations, and alignment with existing assessment systems. The study's demonstration of effectiveness without significant school differences suggests that implementation may be feasible across diverse educational settings within Thailand.

7.5 Limitations and future research directions

Several limitations should be acknowledged in interpreting these findings. The study's focus on two schools in Udon Thani Province limits generalizability to other regions of Thailand with different cultural or educational characteristics. Additionally, the 12-week implementation period, while sufficient for demonstrating short-term effectiveness, does not address long-term retention or sustained implementation challenges.

Future research should investigate several important questions emerging from these findings. Longitudinal studies examining sustained effects of collaborative learning implementation would strengthen evidence for educational policy recommendations. Comparative studies across different regions of Thailand would enhance understanding of cultural and contextual factors influencing collaborative learning effectiveness.

Research examining teacher preparation and professional development needs for effective 5 STEPs implementation would provide practical guidance for educational administrators. Additionally, studies investigating adaptations of the 5 STEPs model for other subject areas would expand understanding of its pedagogical versatility.

8. CONCLUSION

This study provides robust empirical evidence for the effectiveness of the 5 STEPs Collaborative Learning Process in enhancing social studies education quality among Thai secondary school students. The exceptional efficiency ratings (87.42/91.83), substantial academic achievement gains ($d = 2.41$), and consistently high student satisfaction levels ($M = 4.67$) collectively demonstrate the pedagogical value of structured collaborative learning approaches in Thai educational contexts.

The findings contribute significantly to the literature on innovative pedagogy in Southeast Asian education while providing practical evidence for educational policy and practice decisions. The 5 STEPs Collaborative Learning Process emerges as a culturally appropriate and educationally effective framework for enhancing social studies instruction quality in Thai secondary schools.

Key implications for educational practice include the potential for widespread implementation of collaborative learning frameworks, with appropriate support for teacher professional development and institutional capacity building. The study's demonstration of effectiveness across diverse student populations suggests broad applicability within Thai educational contexts.

The research also highlights the importance of structured approaches to collaborative learning implementation, supporting theoretical perspectives emphasizing the critical role of positive interdependence and individual accountability in group learning effectiveness. These

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findings extend collaborative learning theory by demonstrating its effectiveness in non-Western educational contexts with distinct cultural characteristics.

For educational practitioners, this study provides evidence-based guidance for implementing innovative pedagogical approaches that honor Thai cultural values while promoting 21st-century skill development. The ready-made lesson materials and implementation framework offer practical tools for educators seeking to enhance social studies instruction quality through collaborative learning strategies.

Future research should continue investigating optimal approaches for collaborative learning implementation in Thai educational contexts, with particular attention to long-term sustainability, teacher preparation needs, and adaptation strategies for diverse educational settings. The foundation established by this study provides a strong basis for continued exploration of innovative pedagogy in Thai secondary education.

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APPENDICES

Appendix A: Research Instrument - Academic Achievement Test

Pre-Test/Post-Test for Social Studies Education Grade 8 - Thai History and Local Culture Total Points: 40 (30 Multiple Choice + 10 Short Answer)

Instructions: Choose the best answer for multiple-choice questions (1-30) and provide complete responses for short-answer questions (31-40).

Multiple Choice Section (30 points)

1. The Sukhothai Kingdom is considered the first Thai kingdom because: a) It was the largest kingdom in Southeast Asia b) It established the Thai writing system c) It was the first to use the name "Thai" d) All of the above
2. Local cultural heritage in Udon Thani Province includes: a) Ban Chiang archaeological site b) Traditional silk weaving c) Local temple architecture d) All of the above

[Items 3-30 continue with similar format covering Thai history, local culture, geography, and civic knowledge]

Short Answer Section (10 points)

31. Explain the significance of the Ban Chiang archaeological site for understanding prehistoric Thailand. (2 points)
32. Describe two traditional cultural practices in your local community and explain their historical origins. (2 points)

[Items 33-40 continue with analytical questions requiring extended responses]

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Appendix B: Student Satisfaction Survey

Student Satisfaction with 5 STEPs Collaborative Learning Process Rating Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Collaborative Experience Quality (7 items)

1. Working in groups helped me understand the material better
2. My group members contributed fairly to our shared work
3. I felt comfortable expressing my ideas in group discussions
4. Group activities were well-organized and purposeful
5. I learned valuable teamwork skills through group work
6. Group discussions helped clarify confusing concepts
7. I enjoyed the collaborative learning experience

Content Relevance (6 items) 8. The lesson content was relevant to my daily life 9. I could connect the historical material to current events 10. The local culture topics were interesting and meaningful 11. The lessons helped me appreciate my cultural heritage 12. The content was appropriate for my grade level 13. I found the subject matter engaging and worthwhile

Learning Engagement (6 items) 14. I was actively involved in all learning activities 15. The 5 STEPs process kept me focused throughout lessons 16. I looked forward to social studies classes 17. The activities challenged me to think critically 18. I felt motivated to participate in discussions 19. The learning process was enjoyable and fun

Overall Learning Experience (6 items) 20. I learned more through collaborative activities than traditional lectures 21. The 5 STEPs process helped me organize my learning 22. I would recommend this teaching method to other students 23. I feel more confident about social studies after these lessons 24. The teaching approach matched my learning style 25. Overall, I am satisfied with this learning experience

Appendix C: Efficiency Evaluation Criteria

80/80 Efficiency Assessment Framework

Process Efficiency (E1) - Maximum 80 points

Implementation Quality (40 points)

- Lesson structure clarity (10 points)
- Teacher facilitation effectiveness (10 points)
- Student engagement levels (10 points)
- Resource utilization quality (10 points)

Student Participation (40 points)

- Active involvement in Setting objectives (8 points)
- Effective Teamwork collaboration (8 points)
- Productive Exploring resources (8 points)
- Meaningful Processing information (8 points)
- Quality Sharing knowledge (8 points)

Product Efficiency (E2) - Maximum 25 points

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- Post-test achievement scores
- Minimum 80% of students must achieve 80% of learning objectives
- Calculated as: (Number of students achieving ≥80% × 25) ÷ Total students

Combined Efficiency Calculation:

- E1/E2 format (e.g., 87.42/91.83)
- Both scores must exceed 80 for acceptable efficiency
- Scores 80-84.99 = Good, 85-89.99 = Very Good, 90+ = Excellent

Appendix D: Statistical Analysis Tables

Table D1: Descriptive Statistics by Demographic Variables

Variable	Category	n	Pre-Test M(SD)	Post-Test M(SD)	Gain Score M(SD)
Gender	Male	49	12.31(3.94)	18.76(4.22)	6.45(2.87)
	Female	49	12.63(3.71)	19.08(4.09)	6.45(2.63)
School	School A	48	12.58(3.85)	19.12(4.18)	6.54(2.81)
	School B	50	12.36(3.80)	18.74(4.13)	6.38(2.69)
Age	13 years	52	12.21(3.77)	18.65(4.07)	6.44(2.72)
	14 years	46	12.76(3.88)	19.22(4.24)	6.46(2.80)

Table D2: Reliability Analysis for Research Instruments

Instrument	Subscale	Items	Cronbach's α	Item-Total Correlation Range
Achievement Test	Total Scale	40	0.84	0.34-0.67
	Knowledge	15	0.79	0.42-0.64
	Comprehension	12	0.81	0.38-0.71
	Application	8	0.76	0.41-0.69
	Analysis	5	0.73	0.45-0.68
Satisfaction Survey	Collaborative Quality	7	0.91	0.56-0.78
	Content Relevance	6	0.87	0.52-0.74
	Learning Engagement	6	0.89	0.58-0.76
	Overall Experience	6	0.85	0.49-0.72

Table D3: Correlation Matrix for Main Study Variables

Variable	1	2	3	4	5	6
1. Pre-test Score	-					
2. Post-test Score	.67**	-				
3. Gain Score	.23*	.78**	-			
4. Process Efficiency	.18	.45**	.34**	-		
5. Product Efficiency	.19	.89**	.84**	.41**	-	

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6. Satisfaction Total	.12	.56**	.52**	.67**	.58**	-

*p < .05, **p < .01

Table D4: ANOVA Results for Group Differences

Source	df	SS	MS	F	p	η²
Gender Effects on Gain Scores						
Between Groups	1	0.001	0.001	0.000	.995	.000
Within Groups	96	729.98	7.60			
Total	97	729.98				
School Effects on Gain Scores						
Between Groups	1	1.25	1.25	0.164	.686	.002
Within Groups	96	728.73	7.59			
Total	97	729.98				
Age Effects on Gain Scores						
Between Groups	1	0.02	0.02	0.003	.957	.000
Within Groups	96	729.96	7.60			
Total	97	729.98				

Table D5: Effect Size Benchmarks and Practical Significance

Outcome Measure	Cohen's d	95% CI	Interpretation	Practical Significance
Overall Achievement	2.41	[1.98, 2.84]	Very Large	Highly Significant
Knowledge Level	1.89	[1.51, 2.27]	Large	Significant
Comprehension Level	1.94	[1.55, 2.33]	Large	Significant
Application Level	1.56	[1.23, 1.89]	Large	Significant
Analysis Level	1.41	[1.10, 1.72]	Large	Significant
Efficiency vs. Standard	1.26	[0.98, 1.54]	Large	Significant
Satisfaction Level	3.51	[2.93, 4.09]	Very Large	Highly Significant

Acknowledgements

The author acknowledges the support and cooperation of participating schools, students, and teachers who made this research possible. Special appreciation is extended to the academic experts who validated research instruments and provided valuable feedback

Insight into Modern Education
ISSN: 3057-0050 (Online), Vol 2 No 3 (September-December, 2024)

throughout the study. This research was conducted independently without external funding support.

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