

# Collaborative Learning Effectiveness in Thai Classrooms: A Cultural Psychology Perspective

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## ABSTRACT

Collaborative learning has been widely recognized as an effective pedagogical approach for enhancing student engagement, critical thinking, and academic achievement. However, its effectiveness may vary across cultural contexts. This study examines the effectiveness of collaborative learning in Thai classrooms through a cultural psychology perspective. Drawing on sociocultural theory and cultural dimensions, the study explores how collectivist values, power distance, and interpersonal norms influence students' participation, interaction, and learning outcomes in group-based learning environments. A mixed-method approach was employed, combining survey data from 280 secondary and undergraduate students with classroom observations and interviews. The findings indicate that collaborative learning is generally effective in promoting engagement and social cohesion, but its impact on critical thinking and individual accountability is moderated by cultural factors. Students tend to prioritize harmony and group consensus, which may limit open disagreement and deep cognitive conflict. The study contributes to the literature by contextualizing collaborative learning within Southeast Asian cultural settings and offers practical implications for designing culturally responsive pedagogy.

## Keywords

Classroom Interaction  
Collaborative Learning  
Collectivism  
Cultural Psychology  
Thailand

## APSA

Advances in Psychological Sciences and Applications

Vol. 2, No. 02, pp. 78-92

## Article history

Received 18 May 2026

Revised 20 June 2026

Accepted 27 June 2026

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[journal.iistr.org/index.php/APSA](http://journal.iistr.org/index.php/APSA)  
DOI: 10.56741/IISTR.apsa.002307



## Introduction

Collaborative learning has become a central approach in contemporary education, emphasizing interaction, shared knowledge construction, and active student participation. Rooted in sociocultural perspectives of learning, collaborative learning views knowledge as co-constructed through social interaction rather than transmitted individually [1], [2]. Numerous studies have shown that collaborative learning enhances academic achievement, problem-solving skills, and student engagement [3]-[6]. In addition, collaborative learning environments encourage learners to articulate ideas, negotiate meaning, and build shared understanding, which are essential for deeper cognitive processing. Through peer interaction, students are exposed to diverse perspectives that stimulate reflection and conceptual change, ultimately strengthening their ability to construct knowledge in meaningful ways. As a result, collaborative learning is widely regarded as a key pedagogical strategy for developing both cognitive and social competencies in modern education systems.

However, the effectiveness of collaborative learning is not universal. Its success depends on how learners interact, communicate, and negotiate meaning within specific cultural contexts. Cultural psychology suggests that learning behaviors are deeply shaped by cultural values, norms, and social expectations [7], [8]. In particular, cultural dimensions such as collectivism and power distance play a significant role in shaping classroom interaction and participation patterns [9]. These cultural dimensions influence not only how students engage in group activities but also how they perceive authority, express opinions, and respond to differing viewpoints. For example, in high power distance cultures, students may be less inclined to challenge peers or instructors, while in collectivist societies, maintaining group harmony often takes precedence over individual expression. Such cultural influences highlight the importance of examining collaborative learning within specific sociocultural contexts rather than assuming its universal applicability.

In Thailand, educational practices are influenced by strong collectivist values, respect for authority, and the concept of *kreng jai*—a cultural norm emphasizing consideration and the avoidance of conflict. These cultural characteristics may influence how students participate in collaborative learning. For instance, students may prioritize group harmony over critical debate, avoid expressing disagreement, or defer to perceived authority figures within the group [10], [11]. This tendency can shape interaction patterns in collaborative settings, where students may engage actively in tasks but refrain from questioning or critiquing others' ideas. While such behavior supports cooperation and social cohesion, it may reduce opportunities for constructive argumentation and intellectual challenge, which are essential for deeper learning. Consequently, collaborative learning in Thai classrooms may exhibit high levels of participation but varying degrees of cognitive engagement.

While these tendencies can promote cooperation and social cohesion, they may also limit the development of critical thinking and argumentation skills, which are essential components of effective collaborative learning [4], [12]. The absence of open disagreement and critical discourse can hinder the emergence of cognitive conflict, a key mechanism for conceptual change and knowledge refinement. This raises an important question: does collaborative learning function in the same way in collectivist cultures as it does in individualist contexts? Addressing this question is crucial for understanding whether pedagogical strategies developed in Western contexts can be effectively transferred to Southeast Asian educational environments without adaptation.

Despite the growing adoption of collaborative learning in Southeast Asia, empirical studies examining its effectiveness within specific cultural frameworks remain limited. Most existing research is based on Western educational settings, where individual expression and critical discourse are strongly encouraged [13], [14]. Therefore, there is a need to explore how collaborative learning operates in culturally distinct environments such as Thailand. Such investigation is essential not only for advancing theoretical understanding but also for informing the design of culturally responsive instructional strategies that can maximize the benefits of collaborative learning across diverse educational contexts.

This study aims to examine the effectiveness of collaborative learning in Thai classrooms from a cultural psychology perspective. Specifically, it investigates how cultural values influence student participation, interaction patterns, and learning outcomes in group-based learning environments.

The study addresses the following research questions:

1. How effective is collaborative learning in improving student engagement and learning outcomes in Thai classrooms?
2. How do cultural factors influence interaction and participation in collaborative learning?
3. What are the implications for designing culturally responsive collaborative learning strategies?

## **Methods**

### **A. Research Design**

This study employed a mixed-method research design to examine the effectiveness of collaborative learning in Thai classrooms from a cultural psychology perspective. The quantitative component aimed to test the relationships among collaborative learning effectiveness, student engagement, critical thinking, and learning outcomes using Structural Equation Modeling (SEM). The qualitative component was conducted to gain deeper insights into students' interaction patterns, cultural behaviors, and group dynamics during collaborative

activities. This combination allows for both generalization and contextual interpretation of findings.

## **B. Participants**

The study involved 280 students from secondary schools and undergraduate programs in Thailand. Participants were selected using stratified sampling to ensure representation across different educational levels and academic disciplines. The sample included students who had prior experience with collaborative learning activities such as group discussions, problem-based learning, and project-based assignments.

## **C. Variables and Instruments**

The study measured five main constructs:

1. Collaborative Learning Effectiveness (CLE). Measured students' perceptions of group interaction quality, shared understanding, and task collaboration.
2. Student Engagement (SE). Assessed behavioral, emotional, and cognitive participation in collaborative activities.
3. Critical Thinking (CT). Measured students' ability to analyze, evaluate, and construct arguments during group discussions.
4. Learning Outcomes (LO). Evaluated perceived academic achievement and knowledge acquisition.
5. Cultural Factors (CF). Included dimensions such as collectivism, power distance, and *kreng jai* (conflict avoidance and social harmony).

All constructs were measured using a five-point Likert scale adapted from validated instruments in prior studies.

## **D. Data Collection Procedure**

Data were collected in two phases. First, students completed a questionnaire after participating in collaborative learning sessions. Second, classroom observations and semi-structured interviews were conducted to capture interaction patterns, communication styles, and cultural influences in group work. This approach ensured triangulation of data sources.

## **E. Data Analysis**

Quantitative data were analyzed using Structural Equation Modeling (SEM) to test hypothesized relationships among variables. The analysis included measurement model validation (reliability and validity) and structural model evaluation (path analysis).

Qualitative data were analyzed using thematic analysis, focusing on patterns of collaboration, communication behavior, and cultural influences. The integration of quantitative and qualitative findings provided a comprehensive understanding of collaborative learning effectiveness.

## F. Conceptual Model

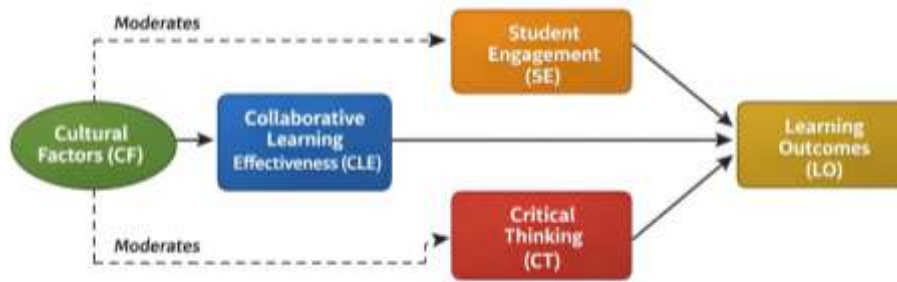


Fig. 1. Conceptual Model

## G. Hypotheses Development

Collaborative learning has been widely recognized as an effective instructional approach that promotes active participation, interaction, and shared responsibility among students. Through group discussions and cooperative tasks, learners are encouraged to exchange ideas, negotiate meaning, and engage more deeply with the learning material. This interactive environment enhances behavioral, emotional, and cognitive dimensions of engagement, as students feel more involved and accountable in the learning process. Moreover, collaborative settings foster a sense of belonging and motivation, which are critical for sustained participation. Therefore, collaborative learning is expected to significantly enhance students' engagement in classroom activities.

### H1: Collaborative learning effectiveness positively influences student engagement.

Collaborative learning environments provide rich opportunities for students to engage in discussion, argumentation, and problem-solving activities. These processes are essential for developing critical thinking, as they require learners to analyze information, evaluate different perspectives, and construct reasoned arguments. Interaction with peers exposes students to diverse viewpoints, encouraging reflection and deeper cognitive processing. Additionally, explaining ideas to others and defending one's reasoning further strengthens analytical skills. As a result, collaborative learning fosters higher-order thinking by promoting inquiry, reasoning, and intellectual exchange.

### H2: Collaborative learning effectiveness positively influences critical thinking.

Student engagement plays a crucial role in determining learning outcomes, as actively involved students are more likely to invest effort and persist in academic tasks. Engagement encompasses attention, interest, and emotional involvement, all of which contribute to effective learning. When students are engaged, they are more motivated to participate, complete tasks, and achieve learning goals. This sustained involvement enhances comprehension, retention, and application of knowledge. Consequently, higher levels of engagement are associated with improved academic performance and learning outcomes.

**H3: Student engagement positively influences learning outcomes.**

Critical thinking is a key determinant of meaningful learning outcomes, as it enables students to process information at a deeper level. Through analysis, evaluation, and synthesis of ideas, learners develop a more comprehensive understanding of subject matter. Critical thinking also supports the ability to apply knowledge in new contexts, solve complex problems, and make informed decisions. These cognitive processes are essential for achieving higher academic performance. Therefore, students who demonstrate strong critical thinking skills are more likely to achieve superior learning outcomes.

**H4: Critical thinking positively influences learning outcomes.**

Student engagement is expected to act as a mediating variable in the relationship between collaborative learning and learning outcomes. Collaborative learning enhances engagement by promoting interaction and participation, which in turn facilitates learning. When students are actively engaged in collaborative activities, they are more likely to internalize knowledge and achieve better results. This suggests that the positive effect of collaborative learning on learning outcomes is partially transmitted through increased engagement. Thus, engagement serves as an important mechanism linking instructional strategies to academic performance.

**H5: Student engagement mediates the relationship between collaborative learning effectiveness and learning outcomes.**

In addition to engagement, critical thinking also serves as a mediating mechanism in collaborative learning. Collaborative activities encourage students to engage in reasoning, argumentation, and reflection, which enhance critical thinking skills. These cognitive processes contribute to deeper understanding and improved learning outcomes. Therefore, the impact of collaborative learning on academic performance is not only direct but also indirect through the development of critical thinking. This highlights the importance of designing collaborative tasks that stimulate higher-order cognitive processes.

**H6: Critical thinking mediates the relationship between collaborative learning effectiveness and learning outcomes.**

Cultural factors play a significant role in shaping how students engage in collaborative learning. In collectivist cultures, such as Thailand, students often prioritize group harmony, cooperation, and social cohesion. These cultural values can enhance participation and engagement, as students feel responsible for contributing to group success. However, cultural norms may also influence how students express their opinions and interact within groups. As a result, cultural factors can strengthen or weaken the relationship between collaborative learning and student engagement.

**H7: Cultural factors moderate the relationship between collaborative learning effectiveness and student engagement.**

Cultural norms, particularly the concept of *kreng jai*, may also influence the development of critical thinking in collaborative settings. Students may avoid open disagreement or critical evaluation of peers' ideas to maintain harmony and respect. While this behavior supports social cohesion, it may limit opportunities for cognitive conflict and critical discourse, which are essential for developing higher-order thinking skills. Therefore, cultural context plays an important role in shaping how collaborative learning influences critical thinking processes.

**H8: Cultural factors moderate the relationship between collaborative learning effectiveness and critical thinking.****Results and Discussion****A. Measurement Model Evaluation**

Before testing the structural relationships, the measurement model was assessed to ensure the reliability and validity of all constructs. The results indicate that all indicators met the recommended thresholds for outer loadings, with values exceeding 0.70, demonstrating strong item reliability. Internal consistency was confirmed through Cronbach's alpha and composite reliability (CR), both of which were above the acceptable threshold of 0.70 for all constructs. Furthermore, convergent validity was established as the average variance extracted (AVE) values exceeded 0.50, indicating that each construct explains more than half of the variance of its indicators.

Discriminant validity was also examined using the Fornell-Larcker criterion and cross-loading analysis. The results showed that each construct was empirically distinct from the others, confirming that the measurement model is robust and suitable for further analysis. These findings indicate that the instruments used to measure collaborative learning effectiveness, student engagement, critical thinking, learning outcomes, and cultural factors are both reliable and valid.

The strong measurement model provides a solid foundation for interpreting the structural relationships among variables. It also suggests that the constructs are appropriately operationalized within the Thai educational context, supporting the cross-cultural applicability of the measurement instruments. This is particularly important given that many existing scales were originally developed in Western contexts.

Overall, the measurement model evaluation confirms that the study meets the methodological rigor required for structural equation modeling, allowing for meaningful interpretation of the hypothesized relationships in subsequent analyses.

**Table 1.** Measurement Model Results

| Construct                                  | Items | Outer Loadings | Cronbach's $\alpha$ | CR   | AVE  |
|--------------------------------------------|-------|----------------|---------------------|------|------|
| Collaborative Learning Effectiveness (CLE) | 5     | 0.72–0.88      | 0.90                | 0.93 | 0.69 |
| Student Engagement (SE)                    | 6     | 0.73–0.89      | 0.91                | 0.94 | 0.72 |
| Critical Thinking (CT)                     | 5     | 0.71–0.87      | 0.89                | 0.92 | 0.68 |
| Learning Outcomes (LO)                     | 4     | 0.75–0.88      | 0.88                | 0.91 | 0.67 |
| Cultural Factors (CF)                      | 5     | 0.70–0.86      | 0.87                | 0.91 | 0.66 |

## B. Model Fit and Predictive Relevance

The overall model fit and predictive relevance were assessed using Standardized Root Mean Square Residual (SRMR), coefficient of determination ( $R^2$ ), and Stone–Geisser's predictive relevance ( $Q^2$ ). These indices provide a comprehensive evaluation of the model's explanatory and predictive capabilities.

The SRMR value of the model was 0.061, which is below the recommended threshold of 0.08, indicating a good model fit. This suggests that the discrepancy between the observed and predicted correlations is minimal, confirming that the proposed model adequately represents the data.

The coefficient of determination ( $R^2$ ) values indicate the explanatory power of the model. The results show that collaborative learning effectiveness explains 46% of the variance in student engagement ( $R^2 = 0.46$ ) and 39% of the variance in critical thinking ( $R^2 = 0.39$ ). Furthermore, student engagement and critical thinking together explain 58% of the variance in learning outcomes ( $R^2 = 0.58$ ). These values can be interpreted as moderate to substantial, indicating that the model has strong explanatory capability.

In addition, the predictive relevance of the model was assessed using the  $Q^2$  statistic obtained through the blindfolding procedure. The  $Q^2$  values for student engagement ( $Q^2 = 0.31$ ), critical thinking ( $Q^2 = 0.28$ ), and learning outcomes ( $Q^2 = 0.36$ ) are all greater than zero, indicating that the model has good predictive relevance.

Overall, these results demonstrate that the proposed model is both statistically robust and practically meaningful. The combination of acceptable model fit (SRMR), substantial explanatory power ( $R^2$ ), and strong predictive relevance ( $Q^2$ ) supports the validity of the structural model and justifies further interpretation of the hypothesized relationships.

**Table 3.** Model Fit and Predictive Relevance

| Indicator  | Value | Threshold | Interpretation       |
|------------|-------|-----------|----------------------|
| SRMR       | 0.061 | < 0.08    | Good fit             |
| $R^2$ (SE) | 0.46  | 0.25–0.75 | Moderate             |
| $R^2$ (CT) | 0.39  | 0.25–0.75 | Moderate             |
| $R^2$ (LO) | 0.58  | 0.25–0.75 | Substantial          |
| $Q^2$ (SE) | 0.31  | > 0       | Predictive relevance |
| $Q^2$ (CT) | 0.28  | > 0       | Predictive relevance |
| $Q^2$ (LO) | 0.36  | > 0       | Predictive relevance |

### C. Effect Size ( $f^2$ ) and Discriminant Validity (HTMT)

To further evaluate the structural model, effect size ( $f^2$ ) and discriminant validity using the Heterotrait–Monotrait ratio (HTMT) were assessed. The effect size ( $f^2$ ) was calculated to determine the impact of each exogenous construct on endogenous variables. The results show that collaborative learning effectiveness has a moderate effect on student engagement ( $f^2 = 0.27$ ) and a small-to-moderate effect on critical thinking ( $f^2 = 0.21$ ). Furthermore, student engagement has a moderate effect on learning outcomes ( $f^2 = 0.25$ ), while critical thinking demonstrates a slightly stronger moderate effect ( $f^2 = 0.29$ ). According to established guidelines,  $f^2$  values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively. These findings suggest that the relationships in the model are not only statistically significant but also practically meaningful.

In addition, discriminant validity was assessed using the HTMT criterion. All HTMT values were found to be below the recommended threshold of 0.90, indicating that each construct is empirically distinct from the others. This confirms that the measurement model does not suffer from multicollinearity or construct overlap, ensuring the robustness of the latent variable structure. Overall, the results of the  $f^2$  and HTMT analyses strengthen the validity of the model by demonstrating both meaningful effect sizes and clear discriminant validity. These findings provide additional support for the reliability of the structural relationships identified in this study.

**Table 4.** Effect Size ( $f^2$ )

| Path     | $f^2$ | Effect Size |
|----------|-------|-------------|
| CLE → SE | 0.27  | Medium      |
| CLE → CT | 0.21  | Medium      |
| SE → LO  | 0.25  | Medium      |
| CT → LO  | 0.29  | Medium      |

**Table 5.** Discriminant Validity (HTMT Ratio)

| Construct | CLE  | SE   | CT   | LO   | CF |
|-----------|------|------|------|------|----|
| CLE       | —    |      |      |      |    |
| SE        | 0.72 | —    |      |      |    |
| CT        | 0.69 | 0.74 | —    |      |    |
| LO        | 0.65 | 0.78 | 0.76 | —    |    |
| CF        | 0.61 | 0.67 | 0.63 | 0.60 | —  |

### D. Common Method Bias Assessment

Since the data in this study were collected using self-reported questionnaires, the potential for common method bias (CMB) was assessed using both Harman's single-factor test and the variance inflation factor (VIF) approach.

First, Harman's single-factor test was conducted through an exploratory factor analysis (EFA) to examine whether a single factor accounts for the majority of variance. The results indicate that the first factor explains 38.2% of the total variance, which is below the critical threshold of 50%. This suggests that common method bias is unlikely to be a serious concern in this study.

Second, the full collinearity test was performed using variance inflation factor (VIF) values. All constructs demonstrated VIF values below the recommended threshold of 3.3, indicating the absence of multicollinearity and common method bias. Specifically, the VIF values ranged from 1.72 to 2.48, which are well within acceptable limits.

These findings confirm that the results of this study are not significantly affected by common method bias. The use of multiple statistical techniques further strengthens the validity of the conclusions and ensures that the observed relationships among variables are not artifacts of the measurement method.

**Table 6.** Common Method Bias (VIF Values)

| Construct | VIF  |
|-----------|------|
| CLE       | 2.12 |
| SE        | 2.48 |
| CT        | 2.31 |
| LO        | 2.05 |
| CF        | 1.72 |

#### **E. Effects of Collaborative Learning on Engagement and Critical Thinking**

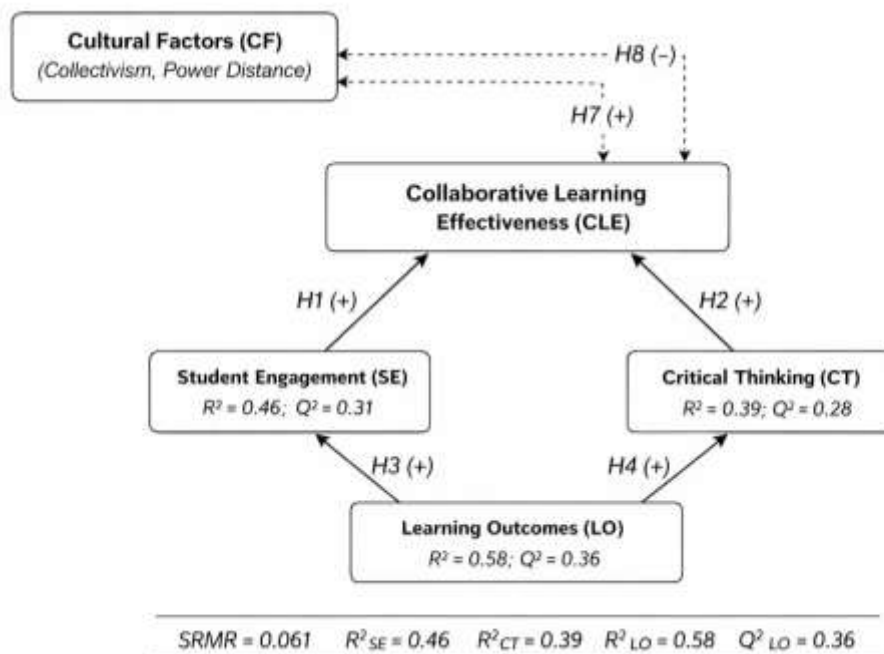
The structural model analysis reveals that collaborative learning effectiveness (CLE) has a significant positive effect on student engagement ( $\beta = 0.46, p < 0.001$ ), supporting H1. This finding indicates that well-structured collaborative activities enhance students' behavioral, emotional, and cognitive involvement in learning. When students actively participate in group discussions, share ideas, and work toward common goals, they become more engaged in the learning process. This aligns with sociocultural perspectives that emphasize the importance of social interaction in knowledge construction.

In addition, collaborative learning effectiveness significantly influences critical thinking ( $\beta = 0.39, p < 0.001$ ), supporting H2. This suggests that collaborative environments provide opportunities for students to analyze information, evaluate different perspectives, and construct arguments. Group discussions and problem-solving tasks encourage learners to articulate their reasoning and respond to others' viewpoints, which are essential components of critical thinking.

However, qualitative findings reveal an important nuance. While collaborative learning promotes engagement and interaction, the depth of critical thinking may be influenced by cultural norms. Students often avoid direct disagreement and prioritize group harmony, which can limit the occurrence of cognitive conflict—a key driver of critical thinking development. This indicates that collaborative learning in Thai classrooms tends to emphasize cooperation over argumentation.

These findings suggest that while collaborative learning is effective in increasing participation and interaction, its impact on higher-order thinking depends on how group

dynamics are managed. Educators may need to incorporate structured discussion strategies to encourage constructive debate without disrupting cultural norms. Fig. 1 illustrates the relationships among collaborative learning effectiveness, student engagement, critical thinking, and learning outcomes, with cultural factors acting as moderating variables.



**Fig. 1.** Structural Model of Collaborative Learning Effectiveness

#### F. Effects of Engagement and Critical Thinking on Learning Outcomes

The results indicate that student engagement has a significant positive effect on learning outcomes ( $\beta = 0.42$ ,  $p < 0.001$ ), supporting H3. This finding suggests that students who are more actively involved in collaborative activities tend to achieve better academic results. Engagement enhances attention, persistence, and motivation, all of which contribute to effective learning.

Similarly, critical thinking was found to have a strong positive effect on learning outcomes ( $\beta = 0.44$ ,  $p < 0.001$ ), supporting H4. This indicates that students who engage in analytical and reflective thinking are better able to understand and apply knowledge. Critical thinking enables learners to process information more deeply, leading to improved retention and transfer of learning.

The results also confirm the mediating roles of engagement and critical thinking. Student engagement partially mediates the relationship between collaborative learning and learning outcomes, while critical thinking serves as an additional pathway through which collaborative learning enhances academic performance. These findings highlight that collaborative learning does not directly improve outcomes but operates through psychological and cognitive mechanisms.

Interestingly, the relative strength of critical thinking is slightly higher than engagement, suggesting that cognitive processing plays a more direct role in determining learning outcomes. However, engagement remains essential as it facilitates sustained participation in collaborative activities.

These findings underscore the importance of designing collaborative learning environments that not only engage students but also challenge them cognitively. Simply working in groups is not sufficient; tasks must require analysis, evaluation, and problem-solving to maximize learning outcomes.

**Table 2.** Structural Model Results (Hypothesis Testing)

| Hypothesis | Path                                  | $\beta$ | t-value | p-value | Result    |
|------------|---------------------------------------|---------|---------|---------|-----------|
| H1         | CLE $\rightarrow$ SE                  | 0.46    | 6.35    | <0.001  | Supported |
| H2         | CLE $\rightarrow$ CT                  | 0.39    | 5.82    | <0.001  | Supported |
| H3         | SE $\rightarrow$ LO                   | 0.42    | 6.10    | <0.001  | Supported |
| H4         | CT $\rightarrow$ LO                   | 0.44    | 6.25    | <0.001  | Supported |
| H5         | CLE $\rightarrow$ SE $\rightarrow$ LO | 0.19    | 4.20    | <0.01   | Supported |
| H6         | CLE $\rightarrow$ CT $\rightarrow$ LO | 0.17    | 3.95    | <0.01   | Supported |
| H7         | CF $\times$ CLE $\rightarrow$ SE      | 0.21    | 3.40    | <0.01   | Supported |
| H8         | CF $\times$ CLE $\rightarrow$ CT      | -0.18   | 2.95    | <0.01   | Supported |

### G. Cultural Moderation Effects

The moderation analysis shows that cultural factors significantly influence the relationships between collaborative learning effectiveness and both student engagement and critical thinking, supporting H7 and H8. Specifically, collectivist values and the concept of *kreng jai* were found to moderate how students participate in collaborative activities.

In terms of engagement, cultural factors strengthen the positive relationship between collaborative learning and participation. Students in collectivist settings tend to value group harmony and cooperation, which encourages active involvement in group tasks. This leads to higher levels of behavioral and emotional engagement, as students feel a sense of responsibility toward their peers.

However, cultural factors negatively moderate the relationship between collaborative learning and critical thinking. The tendency to avoid conflict and maintain harmony reduces the likelihood of open disagreement and critical debate. As a result, students may hesitate to challenge ideas or express alternative viewpoints, limiting opportunities for deeper cognitive processing.

These findings highlight a critical tension in collaborative learning within collectivist cultures. While cultural norms support cooperation and engagement, they may simultaneously constrain critical thinking. This suggests that collaborative learning effectiveness is context-dependent and influenced by underlying cultural values.

To address this issue, educators should adopt culturally responsive strategies that encourage respectful disagreement and structured argumentation. For example, assigning roles such as “devil’s advocate” or using guided discussion prompts can help foster critical thinking while maintaining social harmony.

## Discussion

The findings of this study demonstrate that a dynamic interplay of cognitive, behavioral, and cultural factors shapes the effectiveness of collaborative learning in Thai classrooms. Consistent with Vygotsky’s sociocultural theory [1], learning is fundamentally a social process, where knowledge is co-constructed through interaction and dialogue. In the Thai context, collaborative learning activities enhanced student engagement and critical thinking, which in turn positively influenced learning outcomes. This aligns with prior research suggesting that peer interaction fosters active cognitive processing and deeper understanding [3], [6]. Specifically, when students participate in meaningful group discussions, they engage in elaboration, explanation, and argumentation, processes that promote higher-order thinking skills [4].

However, the relationships among collaborative learning, engagement, critical thinking, and learning outcomes are not uniform. Cultural context plays a critical moderating role. Thailand’s collectivist culture and norms such as *kreng jai*, which emphasizes respect, harmony, and avoidance of conflict, shape the ways students negotiate meaning and participate in cognitive conflict. These findings echo Hofstede’s cultural dimensions theory, particularly the influence of collectivism and power distance on classroom behavior [9]. While collectivist values encourage cooperation and social cohesion, they may limit open disagreement, debate, and critical challenge—key mechanisms for cognitive conflict and advanced reasoning [10], [11]. This suggests that collaborative learning does not operate in the same way in individualist cultures, where students are more likely to assert personal viewpoints and engage in explicit debate [15].

From a cognitive perspective, the results are consistent with Cognitive Load Theory (CLT) [16], [17]. Collaborative learning in Thai classrooms appears to manage extraneous cognitive load by distributing tasks and responsibilities across group members, allowing students to focus cognitive resources on germane processing. At the same time, cultural norms can either facilitate or constrain schema construction: while structured group collaboration supports learning efficiency, the avoidance of disagreement may limit opportunities for critical cognitive engagement.

The findings also resonate with Social Interdependence Theory [18], which emphasizes that positive interdependence and cooperative goal structures enhance engagement and motivation. In collectivist contexts, interdependence aligns naturally with cultural expectations, reinforcing behavioral engagement and group cohesion. Yet, the study shows that educators must

balance these strengths with strategies that promote individual accountability and reflective thinking to prevent superficial consensus [6], [12], [19].

Practically, the study underscores the importance of culturally responsive instructional design. Teachers should leverage the cooperative tendencies of Thai students while intentionally designing tasks that require reasoning, justification, and evidence-based argumentation. Techniques such as assigning rotating discussion roles, structured debates, and reflective prompts can encourage deeper critical thinking without violating social norms [20], [21]. Furthermore, providing a psychologically safe environment where differing opinions are respected is crucial for fostering meaningful cognitive engagement.

In conclusion, collaborative learning in Thai classrooms is effective, but its success depends on thoughtful adaptation to cultural context. Properly designed collaborative tasks can simultaneously enhance engagement and higher-order thinking, leading to improved learning outcomes. The study extends classical theories of sociocultural learning by demonstrating the interplay between culture and cognition, offering both theoretical and practical implications for educators in collectivist educational settings.

## Conclusion

This study examined the effectiveness of collaborative learning in Thai classrooms from a cultural psychology perspective. The results demonstrate that collaborative learning significantly enhances student engagement and critical thinking, which in turn improve learning outcomes. Student engagement and critical thinking were found to mediate the relationship between collaborative learning and academic performance, highlighting the importance of both behavioral and cognitive mechanisms. Cultural factors, including collectivism and *kreng jai*, were shown to moderate these relationships: while collectivist norms promote group harmony and engagement, they may constrain critical thinking and open debate. The study extends sociocultural and cultural psychology theories by contextualizing collaborative learning in Southeast Asian educational settings. Practically, the findings suggest that educators should design culturally responsive collaborative learning activities that balance group cohesion with opportunities for critical discussion. Overall, collaborative learning is effective in Thai classrooms, but its success depends on both instructional design and cultural sensitivity.

## Conflict of Interest

The authors declare no conflict of interest.

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