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Cooperative Learning: A Tool for Critical Thinking, Decision Making, and Interpersonal Relationships

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ABSTRACT

Cooperative learning (CL) is a learner-centred pedagogical approach in which students work collaboratively in small groups to achieve shared academic goals. Unlike competitive or individualistic models, CL emphasizes positive interdependence, accountability, and mutual support, thereby fostering both academic achievement and socio-emotional growth. This paper synthesizes empirical research and meta-analyses to examine the cognitive, social, and affective benefits of CL in diverse educational contexts. Findings indicate that CL significantly enhances critical thinking, decision-making, and problem-solving abilities while promoting empathy, interpersonal relationships, and inclusive classroom environments. Evidence also suggests that cooperative tasks improve student motivation, engagement, and reflective learning, preparing learners for the collaborative demands of the 21st century. The analysis highlights not only the effectiveness of CL in strengthening academic outcomes but also its role in nurturing holistic development and critical citizenship. By integrating rigorous content learning with social-emotional development, CL emerges as a transformative pedagogical strategy that aligns with contemporary educational priorities of equity, inclusivity, and lifelong learning.

Keywords: *Cooperative learning, critical thinking, decision making, interpersonal relationships, collaborative learning, socio-emotional learning, 21st-century skills*

Introduction

Cooperative learning (CL) is a multifaceted pedagogy that has gained widespread recognition for its dual capacity to enhance academic achievement and foster essential social skills. Unlike traditional individualistic or competitive learning models, CL organizes students into structured small groups that work collaboratively toward shared academic goals. The hallmark of CL lies in cultivating environments characterized by positive interdependence, individual accountability, and promotive interaction (Johnson & Johnson, 1999; Slavin, 2015). Within such settings, students engage in peer discussions, critical questioning, and the

exchange of diverse perspectives, thereby deepening conceptual understanding and strengthening higher-order cognitive as well as social-emotional skills essential for lifelong success.

The essential components of CL include positive interdependence, where learners perceive their success as tied to the success of their peers; individual accountability, which ensures meaningful contributions from all members; and promotive interaction, which involves face-to-face support and encouragement within the group (Yang, 2023). In addition, the explicit teaching of small-group and interpersonal skills—such as communication, conflict resolution, and decision-making—combined with structured group reflection, fosters a productive and harmonious classroom culture (Cooper, 1995). These organized interactions promote active participation, motivation, and social bonding, leading to enhanced academic and social outcomes (Gillies, 2016).

Research over the past decades consistently highlights CL as central to the development of critical thinking, decision-making, and interpersonal competencies (Gokhale, 1995; Johnson & Johnson, 2009). Critical thinking thrives in cooperative settings as students collectively critique problems, weigh alternative solutions, and construct reasoned arguments with peer feedback. This reflective process cultivates intellectual autonomy and cognitive flexibility, skills essential for navigating today's complex, information-dense world. Decision-making is similarly strengthened when learners negotiate diverse perspectives, balance evidence, and work toward consensus, thereby developing both individual judgment and collaborative problem-solving capacities (Gillies, 2016).

Socially, CL provides an ideal context for nurturing interpersonal relationships. Learning in heterogeneous groups encourages communication, empathy, trust, and conflict resolution skills (Gokhale, 1995). Cooperative social interactions help reduce barriers, foster inclusivity, and develop supportive peer networks that extend beyond the classroom into higher education, workplaces, and civic life. Empirical findings further indicate that schools adopting CL strategies report higher student achievement compared to those relying solely on traditional instruction, with benefits including stronger retention, deeper conceptual understanding, and greater application of knowledge through peer teaching and instant feedback (Johnson, Johnson, & Smith, 2014; Kagan, 2014). Additionally, CL enhances student motivation by fostering a sense of belonging and shared responsibility within groups.

Most importantly, CL aligns with the demands of 21st-century education, which emphasizes critical thinking, teamwork, communication, and creativity (Silva et al., 2022; Nguyen, 2025). By shifting from rote memorization to active knowledge construction through dialogue and inquiry, CL promotes self-regulation and metacognition, enabling learners to adapt to evolving academic and professional challenges.

However, the effectiveness of CL depends on deliberate instructional design and sustained teacher facilitation. Challenges such as uneven participation, social loafing, and group conflict may arise if roles and expectations are not clearly defined or if collaborative skills are underdeveloped. Effective strategies include assigning specific group roles, directly teaching cooperative skills, and monitoring group dynamics to ensure accountability and equity (Cooper, 1995; Gillies, 2016).

In sum, cooperative learning is a powerful pedagogical approach that unifies cognitive development with

social-emotional growth. By enhancing critical thinking, strengthening decision-making, and fostering interpersonal relationships, it prepares students to become reflective, autonomous, and socially capable individuals. This paper explores how CL functions as an innovative tool of contemporary pedagogy, drawing on recent research findings and practical recommendations for educators seeking to design interactive, efficient, and inclusive classrooms.

Objectives

This study aims to:

- Synthesize empirical research on the impact of cooperative learning on **critical thinking skills**.
- Examine evidence on how Cooperative learning (CL) enhances **decision-making abilities** in collaborative learning environments.
- Analyze studies on the effect of Cooperative learning (CL) on **interpersonal relationships and socio-emotional development**.
- Identify patterns, mechanisms, and best practices in Cooperative learning (CL) implementation.
- Highlight challenges and recommendations for effective adoption of Cooperative learning (CL) in educational settings.

Methodology

This study adopts a systematic literature review approach, integrating both quantitative and qualitative findings. Key steps include:

- **Identification of Literature:** Peer-reviewed empirical studies, meta-analyses, and case studies on cooperative learning were identified from journals, conference proceedings, and credible online sources.
- **Inclusion Criteria:** Studies included:
    - Examined CL interventions.
    - Reported outcomes on critical thinking, decision-making, or interpersonal/social skills.

Were conducted in formal educational contexts.

- **Exclusion Criteria:** Studies without measurable outcomes or focusing on non-CL methods were excluded.
- **Data Extraction:** Information such as study design, sample characteristics, intervention type, outcomes, and effect sizes were recorded.
- **Synthesis:** Quantitative results (e.g., pretest-posttest gains, effect sizes) were summarized in tables, while qualitative results were thematically analyzed to identify mechanisms and trends.

Population

The population considered in this review includes students across multiple educational levels, from preschool children to higher education learners, who participated in CL interventions in the included studies.

Sample

The sample refers to participants reported in the reviewed studies:

- **Critical Thinking Studies:** Middle and secondary school students (e.g., 60 seventh graders in a pretest-posttest design).
- **Decision-Making Studies:** Higher education students (e.g., 136 accounting students in cooperative groups).
- **Interpersonal Skills Studies:** Preschool children (n = 48) and middle school students (n ≈ 1,890).
- **Meta-Analysis:** ~4,000 participants across 40 studies in physical education settings.

Cooperative Learning and Critical Thinking

Cooperative learning (CL) is a powerful pedagogical strategy for fostering critical thinking—the ability to analyze, evaluate, and synthesize information to make well-reasoned judgments. CL actively engages students in reflective group discussions, problem-solving activities, and reciprocal questioning, providing rich opportunities for deep cognitive involvement (Johnson & Johnson, 2009). Among the various cooperative learning models, **Jigsaw** and **Think-Pair-Share** have proven highly effective in promoting active participation and enhancing critical thinking skills (Payri, 2015).

Research indicates that CL environments strengthen understanding through peer debate and mutual questioning, both of which are fundamental to cultivating critical thinking (Johnson & Johnson, 2009). Multiple studies have reported that students working in cooperative groups outperform those in conventional instructional settings, as collaborative dialogue encourages consideration of diverse perspectives and challenges assumptions (Gillies, 2016). For

example, a qualitative analysis by Harianto (2024) demonstrated that students participating in CL activities significantly improved their critical thinking through inter-group interactions, task-oriented learning, and collective problem-solving experiences, thereby enhancing overall learning outcomes.

Furthermore, empirical evidence highlights that structured CL methods, such as Think-Pair-Share, foster positive interdependence and accountability within pairs or groups, supporting mastery of complex cognitive skills such as argumentation, analysis, and interpretation (Silva et al., 2022). Beyond cognitive gains, cooperative learning also develops social and communication skills essential for critical thinking, including attentive listening, respectful verbal expression, and effective regulation of group interactions (Suprijono, Abbas, & Riyadi, 2025).

In conclusion, cooperative learning is an effective instructional approach for advancing critical thinking by leveraging peer interaction, structured collaboration, and reflective discussion. By engaging students in these dynamic learning processes, CL not only enhances academic performance but also prepares learners to navigate complex problem-solving challenges in real-world contexts.

Empirical Findings on Critical Thinking Enhancement

Cooperative learning (CL) has been empirically demonstrated to be an effective approach for developing critical thinking skills. A qualitative review of the literature by Harianto (2024) synthesized findings from multiple studies and concluded that CL environments foster critical thinking by providing learners with opportunities for collaborative analysis, evaluation, and synthesis of information. In these settings, students actively engage in peer debate, problem-solving, and reflective questioning, promoting the deep cognitive processing essential for sound critical thinking.

Supporting this conclusion, a quasi-experimental study examined the effects of cooperative learning interventions combined with reflective thinking activities on seventh-grade students' critical thinking abilities. The study employed a pretest-posttest control group design with 60 participants, randomly assigned in equal numbers to treatment and control groups. The treatment group received CL-based instruction guided by structured reflective discussions, whereas the control group was taught using traditional teacher-led methods. The pre-test and post-test results of this study, summarized in Table 1, illustrate the significant improvement in critical thinking skills among students in the cooperative learning group compared to the control group.

Table 1: Pretest and posttest scores of treatment and control groups for critical thinking

skills (scale: 0–100).
The treatment group showed a statistically significant greater gain in critical thinking skills compared to the control group ($p < 0.01$).

Group	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Gain	t-value	Significance (p)
Treatment	30	62.1	8.5	78.3	7.2	16.2	6.89	< 0.01
Control	30	61.5	9.2	65.7	8.8	4.2	2.03	> 0.05

Analysis

The mean gain of 16.2 points in critical thinking among the treatment group was significantly greater than the 4.2 points gained by the control group. The results of t-tests showed this to be statistically significant ($t = 6.89$, $p < 0.01$), thus establishing that cooperative learning with reflective elements significantly enhances critical thinking. Moreover, qualitative participant feedback from the treatment group identified greater engagement, greater understanding, and better capacity to defend opinion in group discussions.

Mechanisms of Improvement

Cooperative learning fosters critical thinking through the following mechanisms:

- **Dynamic Engagement:** Students actively debate multiple perspectives, inquire critically, and collaboratively construct knowledge.
- **Reflective Discussion:** Structured reflective questioning encourages learners to evaluate their assumptions and reasoning.
- **Social Accountability:** Individual responsibility within groups motivates learners to prepare, articulate, and justify arguments (Zhang, Qi, Xia, Sun, & Chen, 2025).
- **Cognitive Disagreement:** Exposure to diverse viewpoints creates cognitive disequilibrium, promoting critical appraisal and higher-order reasoning.

Together, these mechanisms create a learning environment conducive to developing analysis, synthesis, and evaluation skills. Consequently, cooperative learning transforms passive learners into active critical thinkers capable of tackling complex intellectual challenges (Khan, 2025).

Cooperative Learning and Decision Making

Cooperative learning (CL) settings foster shared accountability and collaborative decision-making, which are essential skills for teamwork and real-life problem-solving. Empirical research indicates that engaging in group problem-solving within CL environments enhances individuals' ability to make sound decisions by balancing multiple perspectives, promoting negotiation, and facilitating consensus-building. While challenges such as social loafing—where some members contribute less effort can reduce group efficiency, well-structured cooperative groups tend to demonstrate higher individual investment in decisions

compared to learners working alone (Garcha & Kumar, 2015).

Empirical Study Overview: Decision-Making through Cooperative Learning

Hawthorne and Hawthorne (1932) conducted a classic study on decision-making with 136 accounting students divided into 29 cooperative groups (3–7 members each). Groups assessed publicly traded companies and collectively determined investment potential. Individual contributions were peer-evaluated, and students completed an unexpected final exam task to measure decision-making performance (Sharma, 2025).

Key Findings:

- Cooperative groups made more rational investment decisions than naïve investors using a simple equal allocation heuristic (1/n). The mean investment by informed students was $29,191, higher than the naïve benchmark of $25,000 ($t(122) = 3.69$, $p < .001$) (Luberger, 2023).
- Individual effort varied, classified as low, equal, or high effort, highlighting the importance of monitoring group interactions (Zhang, Xu, & Ma, 2025). Table 2 illustrates how individual effort influenced investment decisions, revealing that high-effort participants contributed more confidently to group consensus, whereas low-effort members tended to follow the majority without active engagement.

Table 2: Investment Decisions by Effort Level

Effort Level	n	Mean Investment ($)	Interpretation
Low Effort	42	30,810	Social loafing; followed group decision
Equal Effort	25	20,800	Less supportive of group consensus
High Effort	56	31,723	Confident and supportive of group consensus

Analysis:

- ANOVA showed significant differences among effort groups in mean investments ($F(2, 120) = 5.271$, $p = .006$), demonstrating that individual effort impacts alignment with group decisions.
- Group size had no significant effect ($F(4, 118) = 1.445$, $p = .224$), but smaller groups had fewer low-effort participants (below 10%) compared to larger groups (28–40%), suggesting group composition affects participation dynamics (Luberger, 2023).

Discussion:

These findings indicate that cooperative learning enhances well-informed decision-making. While social loafing occurs in larger groups, it is reduced in smaller groups, confirming the optimal group size of three members. High-effort individuals generally support and invest more in group decisions, whereas equal-effort members contribute less, reflecting partial disengagement. These results underscore the importance of structured groups and peer

accountability for maximizing decision-making outcomes in cooperative learning environments (Akbar & Akhtar, 2021).

Interpersonal Relationships through Cooperative Learning

Cooperative learning (CL) heavily promotes critical social skills like active listening, empathy, good communication, and conflict [1]resolution, all of which are the building blocks of successful interpersonal relationships. Aside from academic gains, CL promotes healthy peer interactions that curb negative behaviors such as bullying by increasing affective empathy—students' ability to feel others' emotions—and fostering prosocial norms in the classroom setting.

Empirical Evidence from a Cluster Randomized Trial

A 1,890 middle school student cluster randomized trial in 15 schools examined the effects of CL on peer relationships, empathy, and bullying (Van Ryzin & Roseth, 2019). The research applied the Johnsons' cooperative learning strategy with features of systematic group work, positive interdependence, individual accountability, and direct coaching in joint social skills. (The Education Hub. (2020, March 10). An introduction to cooperative learning. The Education Hub).

The sample was demographically representative: about 47% female, 75% White, with some representation from Hispanic/Latino and multi-racial groups. Data collection involved surveys completed over four waves, assessing bullying behaviors, peer relatedness (feelings of acceptance by peers), cognitive empathy (understanding others' feelings), and affective empathy (emotional sharing with others). (Han, S. I., & Son, H. S. (2020). Effects of cooperative learning on the improvement of interpersonal competence among students in classroom environments. International Online Journal of Education and Teaching (IOJET), 7(1), 17–28.)

Key Findings

• Cooperative learning resulted in overall decreases in bullying behavior relative to controls.

• These decreases were brokered by increases in affective empathy but not cognitive empathy.

• Cooperative learning also enhanced peer relatedness, which in turn further increased both cognitive and affective empathy.

• Positive peer relations, in turn, were independently related to reductions in bullying.

Table 3: Effects of cooperative learning on bullying, empathy, and peer relatedness.

Variable	Intervention Group Mean (Waves 1-4)	Control Group Mean (Waves 1-4)	Effect Size (β)	Significance (p)
Bullying (Slope)	Decreased	Stable	-0.30	<0.001
Affective Empathy (Slope)	Increased	Slight Increase	+0.26	0.045
Cognitive Empathy (Slope)	Increased	Slight Increase	+0.45	0.001
Peer Relatedness	Increased	No Change	+0.18	<0.001

Table 3 presents the impact of cooperative learning (CL) interventions on bullying, affective and cognitive empathy, and peer relatedness over four measurement waves. The results indicate that students in the intervention group experienced a decrease in bullying ($\beta = -0.30$, $p < 0.001$), increases in affective empathy ($\beta = +0.26$, $p = 0.045$), cognitive empathy ($\beta = +0.45$, $p = 0.001$), and peer relatedness ($\beta = +0.18$, $p < 0.001$), compared to the control group, which showed stable or minimal changes.

Analysis and Mechanisms Linking CL to Interpersonal Development:

- Cooperative learning (CL) facilitates structured group interactions that promote social bonding through face-to-face engagement and shared goals, reducing status differences and fostering supportive peer relations (Akbar & Akhtar, 2021).
- Teacher reinforcement of positive social behaviours and reflective group processing further strengthens friendships and empathy.
- Improvements in affective empathy allow students to experience classmates' emotions vicariously, lowering aggressive behaviours such as bullying. Enhanced peer relatedness fosters a positive social school climate, which independently discourages bullying and promotes prosocial behaviour (Loeser, 2024).
- Empirical evidence confirms that CL enhances emotional intelligence, peer connectedness, and inclusive classroom communities, representing a holistic approach to student development that integrates cognitive, social, and emotional growth (Birt, 2025; Rowe & Turner, 2020; The Education Hub, 2020).

Statistical Evidence of Interpersonal Skill Improvement

Cooperative learning (CL) has a significant positive impact on the development of interpersonal and social skills, particularly among young learners. Empirical evidence indicates that CL interventions enhance communication, collaboration, and empathy, thereby fostering stronger peer relationships and social competence (Mendo-Lázaro, 2022). In a study with 48 preschool children in Kenya, participants were randomly assigned to a treatment group ($n = 24$) and a control group ($n = 24$) to examine the effects of CL on interpersonal and social skills. The treatment group engaged in structured CL activities designed to promote interaction, communication, empathy, and collaboration, while the control group received conventional teacher-led instruction without peer collaboration (Loeser, 2024; Mendo-Lázaro, 2022). Results showed that children in the treatment group

exhibited statistically significant improvements in interpersonal and social skills compared to the control group, demonstrating higher levels of social engagement, positive peer interactions, collaborative problem-solving, and empathy (Nguyen, 2025). These findings suggest that early exposure to cooperative learning effectively cultivates essential social competencies and prepares young learners for future academic and social challenges.

Table 4: Interpersonal and Social Skills Scores in Cooperative Learning

Group	N	Mean	Std. Deviation	Std. Error Mean
Treatment	24	18.5	1.59	0.32
Control	24	14.5	1.59	0.32

The mean score of the treatment group was 18.5 (SD = 1.59), which was significantly higher than the control group's mean of 14.5 (SD = 1.59). An independent samples t-test indicated a t-value of 8.726 with 46 degrees of freedom ($p < 0.001$). The effect size, calculated using Cohen's d, was 1.588, indicating a large practical effect of cooperative learning on the development of interpersonal skills (The Manthan School, 2021).

Interpretation

The large effect size provides strong evidence that cooperative learning (CL) interventions yield substantial improvements in interpersonal skills among preschool children. Structured group interaction in CL promotes active listening, empathy, cooperation, and conflict resolution. These results underscore the effectiveness of cooperative learning as an instructional model that enhances social and emotional development alongside cognitive growth, contributing to holistic childhood development (Loeser, 2024). Graphical representations, such as bar charts, can be used to visually communicate these findings.

Meta-Analysis of Cooperative Learning in Physical Education

A meta-analysis integrating findings from 40 empirical studies with approximately 4,000 participants examined the effectiveness of cooperative learning (CL) in physical education settings. The analysis revealed positive, moderate-to-strong effects across multiple domains:

- **Affective domain (ES = 0.304):** Improvements in attitudes, motivation, and emotional engagement.
- **Physical domain (ES = 0.471):** Enhanced motor skills, physical fitness, and performance.
- **Cognitive domain (ES = 0.589):** Gains in knowledge acquisition, strategic thinking, and critical reflection applicable to physical activities.
- **Social domain (ES = 0.612):** Strong development in teamwork, communication,

leadership, and peer relationships.

These findings highlight the comprehensive impact of cooperative learning, fostering cognitive, social, emotional, and physical development simultaneously. Notably, the largest effects were observed in social and cognitive domains, emphasizing the pivotal role of collaboration and higher-order thinking within cooperative learning arrangements (Harianto, 2024; Mendo-Lázaro, 2022).

Challenges and Recommendations

Effectively implementing cooperative learning (CL) in classrooms involves addressing several recurring challenges reported in educational research (Mesghina, 2024):

- **Managing Group Dynamics:** Ensuring equitable contribution from all group members and resolving conflicts productively can be difficult.
- **Fair Share of Work:** Preventing social loafing or dominance by certain individuals is crucial to maintain accountability.
- **Teacher Facilitation:** Active teacher involvement is essential to guide collaboration, clarify roles, and monitor progress.

To overcome these challenges, educators are advised to follow evidence-based best practices (Akbar & Akhtar, 2021):

- **Construct Organized Activities:** Assign clear group roles (e.g., facilitator, recorder) and define explicit tasks to ensure each student's accountability.
- **Teach Collaborative Skills:** Provide instruction in conflict resolution, effective communication, and group decision-making to equip students with essential social competencies.
- **Continuous Monitoring:** Use formative assessments and observe group interactions to provide timely feedback and address emerging issues.
- **Develop an Inclusive Climate:** Foster a classroom environment that values diversity, promotes respect, and encourages collaboration among all students.

Through the integration of these strategies, cooperative learning can achieve its full potential, fostering holistic learners who are academically competent and socially and emotionally adept (Penn State Learning, 2017).

Conclusion

Cooperative learning (CL) is a highly adaptive pedagogical approach that strengthens critical thinking, enhances decision-making skills, and promotes positive interpersonal relationships among students. Empirical research consistently demonstrates CL's impact on both cognitive and social-emotional

development, validating its value beyond traditional academic outcomes (Cesa-Bianchi, Cesari, & Della Vecchia, 2022). The studies integrated in this paper highlight that CL improves critical thinking through active discussion, collaborative problem-solving, and reflective questioning. Decision-making abilities are enhanced by promoting collective responsibility and exposure to diverse perspectives. Furthermore, CL positively affects interpersonal development, fostering empathy, improving peer relations, reducing bullying, and establishing constructive social norms. While challenges such as uneven participation and group dynamics remain, these can be mitigated through careful instructional planning, direct teaching of teamwork skills, and sensitive teacher facilitation. As modern education increasingly demands the preparation of students capable of addressing complex real-world problems, cooperative learning offers comprehensive development by integrating cognitive, affective, and social learning (Erdogan, 2019).

In conclusion, cooperative learning is not only a powerful tool for academic achievement but also an essential pedagogical methodology for the 21st century. Its effective implementation equips learners to become reflective thinkers, confident decision-makers, and socially competent individuals capable of thriving in dynamic environments.

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