



From movement skills to social inclusion: a systematic review of cooperative learning across activity-based learning

De las habilidades motrices a la inclusión social: una revisión sistemática del aprendizaje cooperativo en el aprendizaje basado en la actividad

Authors

Muhammad Wahyu Setiyadi ¹
Putu Budi Adnyana ²
I Wayan Suastra ³
Desak Made Citrawathi ⁴

¹⁻⁴ Ganesha University of Education
(Singaraja-Indonesia)

Corresponding author:
Muhammad Wahyu Setiyadi
wahyusetiyadi074@gmail.com

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Abstract

Introduction: Cooperative learning has increasingly been applied in physical education and other activity-based learning contexts to connect movement development with motivation, peer interaction, responsibility, and inclusion. However, the evidence had remained fragmented across educational levels, activity types, intervention designs, and outcome domains.

Methodology: Scopus was searched on 13 July 2026 using a predefined Boolean strategy and eligibility criteria. Of 1,177 records initially identified, 36 unique studies published from 2017 to 2026 were included after publication-year and database restrictions, scope assessment, and eligibility screening. Because participants, activities, interventions, designs, and measures were heterogeneous, findings were synthesized narratively across four domains. Methodological quality was assessed using RoB 2, ROBINS-I, and design-specific MMAT criteria.

Results: Cooperative learning was associated with favorable outcomes in motor skills, academic learning time, motivation, responsibility, peer relationships, empathy, and prosocial behavior. Social-affective benefits did not consistently coincide with superior physical performance, and physical-activity outcomes varied with intervention duration, task design, habituation, and teacher support. Methodological appraisal revealed frequent concerns, especially in nonrandomized studies.

Discussion: Positive interdependence, individual accountability, meaningful roles, feedback, and sustained teacher scaffolding appeared important for productive cooperation, whereas poorly structured group work could reproduce dominance, inactivity, or unequal participation. **Conclusions:** Cooperative learning should not be assumed to be inclusive by default; its educational value appears to depend on equitable task access, meaningful contribution, sufficient movement opportunities, explicit peer-feedback structures, and sustained implementation.

Keywords

Cooperative learning; movement competence; physical activity; physical education; social inclusion.

Resumen

Introducción: El aprendizaje cooperativo se había aplicado cada vez más en la educación física y en otros contextos de aprendizaje basados en la actividad para relacionar el desarrollo motor con la motivación, la interacción entre iguales, la responsabilidad y la inclusión. Sin embargo, la evidencia había permanecido fragmentada entre niveles educativos, tipos de actividad, diseños de intervención y dominios de resultados.

Metodología: Se buscó en Scopus el 13 de julio de 2026 mediante una estrategia booleana y criterios predefinidos. De 1.177 registros iniciales, se incluyeron 36 estudios únicos publicados entre 2017 y 2026 tras las restricciones y el cribado de elegibilidad. Debido a la heterogeneidad de participantes, intervenciones, diseños y medidas, los hallazgos se sintetizaron narrativamente en cuatro dominios. La calidad metodológica se evaluó mediante RoB 2, ROBINS-I y MMAT.

Resultados: El aprendizaje cooperativo se asoció con resultados favorables: habilidades motrices, tiempo académico de aprendizaje, motivación, responsabilidad, relaciones entre iguales, empatía y conducta prosocial. Los beneficios socioafectivos no coincidieron siempre con un rendimiento físico superior, y la actividad física varió según duración, diseño de tareas, habituación y apoyo docente. La evaluación metodológica mostró preocupaciones, especialmente estudios no aleatorizados.

Discusión: La interdependencia positiva, la responsabilidad individual, los roles significativos, la retroalimentación y el andamiaje docente parecieron importantes para una cooperación productiva, mientras que el trabajo grupal poco estructurado podía reproducir participación desigual. **Conclusiones:** El aprendizaje cooperativo no debe asumirse como inclusivo por defecto; su valor depende del acceso equitativo a las tareas, la contribución significativa, oportunidades de movimiento, retroalimentación entre iguales e implementación sostenida.

Palabras clave

Actividad física; aprendizaje cooperativo; competencia motriz; educación física; inclusión social.



Introduction

Activity-based learning occupies a distinctive educational space because bodily participation, cognition, emotion, and social interaction occur at the same time. It includes physical education, school sport, dance, movement education, active games, fitness, outdoor learning, and interdisciplinary activities in which movement is not merely a break from academic work but a central medium of learning. Research on pedagogical models has increasingly moved beyond teacher-led reproduction toward approaches that distribute responsibility, invite decision-making, and recognize social learning as part of educational quality. Nevertheless, the literature remains uneven across regions, age groups, activity types, and outcomes, while cooperative structures are still infrequently observed in ordinary lessons despite children valuing challenge, progress, interaction, and voice (Adank et al., 2024; Bores-García et al., 2021; Fernandez-Rio & Iglesias, 2024).

Movement competence is central to this discussion because it influences learners' ability to enter tasks confidently, sustain practice, and experience physical activity as a domain in which improvement is possible. Cooperative learning may support this process by organizing peer demonstration, reciprocal observation, feedback, repetition, and shared problem-solving around common goals. Previous studies have examined these mechanisms in volleyball, basketball, gymnastics, football, and fundamental movement activities, but findings vary across skills, tasks, instructional structures, and outcome measures (Akkaya & Mirzeoğlu, 2024; Faozi et al., 2024; Khataybeh et al., 2024; Kuspratiwi et al., 2026). This variation suggests that the educational value of cooperation depends not only on whether learners work together, but also on how interaction is connected to individual practice and skill development.

The motivational case for cooperative learning is equally important. Activity-based environments can expose differences in skill, confidence, body image, and prior experience, making public comparison especially consequential. Cooperative structures may shift attention from outperforming peers toward mastery, responsibility, and mutual improvement. Evidence indicates gains in mastery climate, emotional self-concept, autonomous motivation, and short-term physical activity, but social-affective improvements do not always coincide with superior fitness or motor performance. Individual accountability appears particularly important for task- and self-approach goals, while habituation to jigsaw structures may influence whether girls and boys obtain comparable amounts of moderate-to-vigorous physical activity (Drouet et al., 2024; C.-H. Huang et al., 2025; Rivera Pérez et al., 2021; Železnik Mežan et al., 2025).

These differences are especially important when cooperative learning is considered in relation to inclusion. Inclusion involves more than placing diverse learners in the same activity or group. It requires access to tasks, opportunities to move, recognition by peers, meaningful contribution, participation in decision-making, and opportunities to develop competence. Research in inclusive dance, team activities, disability contexts, and mixed-gender learning environments illustrates that physical presence and meaningful participation are not equivalent. Learners may formally share the same activity while experiencing unequal access to movement, responsibility, peer recognition, or influence within the group (García-Taibo et al., 2024; González-Valero et al., 2021; Hovdal et al., 2021; Llorens Gómez et al., 2024).

Such outcomes depend on implementation. Cooperative learning is not equivalent to asking learners to work in groups. Authentic implementation requires positive interdependence, individual accountability, promotive interaction, interpersonal skills, and group processing. Teachers must also possess content knowledge, pedagogical content knowledge, and the capacity to scaffold observation, feedback, conflict management, and equitable task adaptation. Studies of preservice and in-service teachers show that jigsaw and scaffolded cooperative designs can improve professional and practical knowledge, but technology integration, teacher motivation, and institutional support can either enable or constrain enactment (Bodsworth & Goodyear, 2017; Jiang et al., 2023; Legrain et al., 2019; Menéndez-Espina et al., 2025).

Contemporary implementations increasingly hybridize cooperation with artificial intelligence, gamification, Teaching Games for Understanding, digital feedback, and self-management. These combinations may increase autonomy, engagement, or feedback quality, yet they also make it difficult to isolate the contribution of cooperative learning. AI-facilitated peer assistance, for example, has been associated with improved skill performance and need satisfaction, while hybrid game-based approaches can



strengthen task-oriented climates and reduce interpersonal comparison. Direct comparisons nevertheless indicate that cooperative interaction can improve retention and communication without necessarily reducing movement time, suggesting that the critical issue is not the amount of talk but whether interaction remains tightly connected to practice (Chiva-Bartoll et al., 2018; Flores-Aguilar et al., 2025; Guzmán & Payá, 2020; Hsia et al., 2025).

A further challenge is duration. Cooperative routines require learners to understand roles, trust peers, give useful feedback, manage disagreement, and accept responsibility for others' learning. These capacities rarely emerge in a single lesson. Sustained interventions have improved intrinsic motivation and identified regulation, while longitudinal qualitative work shows that some groups need many lessons before cooperation becomes productive and inclusive. Cooperative learning is therefore better conceptualized as a developmental pedagogy than as a short instructional technique (Bjørke & Mordal Moen, 2020; Fernandez-Rio et al., 2017).

Recent reviews have established that cooperative learning can produce generally favorable outcomes in physical education, including learning, motivation, and social development (Boke et al., 2025; Bores-García et al., 2021; Fernández-Río & Iglesias, 2022). However, existing syntheses have primarily examined cooperative learning as a pedagogical model or aggregated its overall effects, leaving less attention to how movement competence, physical participation, motivational processes, relational development, and meaningful inclusion interact within activity-based settings. The present review extends this literature by integrating these domains within a single synthesis and by examining the implementation conditions such as individual accountability, task accessibility, group composition, teacher scaffolding, intervention duration, and implementation fidelity that may explain why cooperative learning supports meaningful participation in some contexts but not others. This implementation-sensitive and inclusion-oriented perspective constitutes the distinctive contribution of the present review.

Against this background, the present review asks five questions: (1) How does cooperative learning influence movement skills, motor competence, sport-specific performance, and active learning time? (2) How does it affect physical participation, motivation, perceived competence, enjoyment, self-efficacy, and intention to remain active? (3) How does it influence peer relationships, responsibility, empathy, prosocial behavior, belonging, and social inclusion? (4) Which pedagogical structures facilitate or constrain the simultaneous development of competence and inclusion? and (5) How do outcomes vary by educational stage, participant characteristics, activity type, intervention duration, group composition, teacher preparation, and methodological quality? The review integrates motor, physical, motivational, relational, and equity outcomes within a single explanatory synthesis and develops an Inclusive Cooperative Activity-Based Learning Framework for research and practice.

Theoretical Background

Social Interdependence and Embodied Knowledge Construction

Social interdependence theory provides the principal explanation for why cooperative goal structures can alter learning. Positive interdependence makes each participant's progress relevant to the group, while individual accountability prevents collective success from concealing limited personal learning. Promotive interaction, interpersonal competence, and group processing translate goal structures into observable behavior. Reviews of cooperative practice consistently warn that placing students together is insufficient; tasks, rewards, roles, and assessment must make mutual support both necessary and educationally useful (Gillies, 2016; Johnson & Johnson, 2009; Slavin, 2014).

Social constructivism extends this account by treating knowledge as mediated through dialogue, observation, imitation, and shared problem-solving. In movement settings, the zone of proximal development is embodied: a peer may demonstrate a trajectory, identify a timing error, provide a tactical cue, or physically model coordination. Such interaction becomes most valuable when learners build on one another's ideas and actions rather than divide work mechanically. Elaborated help, transactive communication, and tactical verbalization can convert peer contact into knowledge construction (Chi & Wylie, 2014; Darnis & Lafont, 2015; Vygotsky, 1978; Webb, 2009).

Feedback is a central mechanism but not automatically effective. Peer comments must clarify the goal, current performance, and next step; otherwise they risk becoming generic praise or inaccurate correction. Mastery experiences, observation of similar peers, and credible persuasion can strengthen self-



efficacy, while public comparison or repeated dependence can undermine it. Cooperative activity should therefore combine accessible challenge with trained observation and specific feedback (Bandura, 1997; Hattie & Timperley, 2007).

Figure 1. Conceptual pathway from cooperative-learning structures to movement, motivational, relational, and inclusive outcomes in activity-based learning.

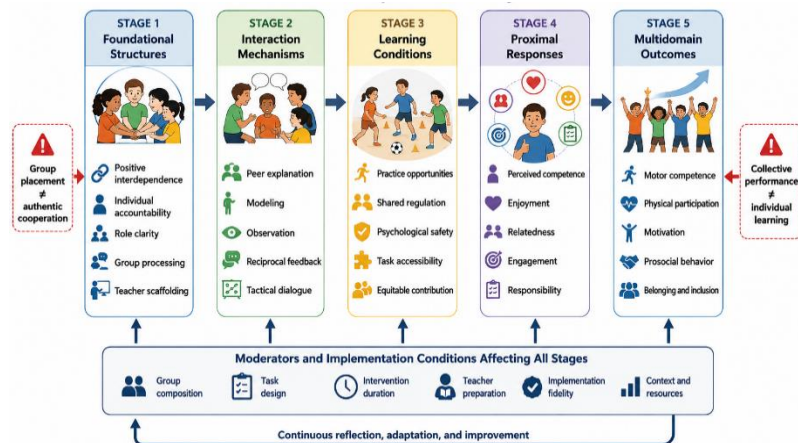


Figure 1 presents the a priori conceptual pathway used to organize the theoretical interpretation of cooperative learning in activity-based settings. The pathway begins with foundational structures such as positive interdependence, individual accountability, role clarity, group processing, and teacher scaffolding. These structures can organize peer interaction through explanation, modeling, observation, reciprocal feedback, and tactical dialogue. Productive interaction may then create learning conditions characterized by repeated practice, shared regulation, psychological safety, accessible tasks, and equitable opportunities to contribute. These conditions may support proximal experiences such as perceived competence, enjoyment, relatedness, engagement, and responsibility, which in turn may be associated with movement competence, physical participation, motivation, prosocial behavior, belonging, and social inclusion.

The pathway is deliberately conditional rather than deterministic. Group composition, task design, intervention duration, teacher preparation, implementation fidelity, and contextual resources may strengthen or constrain each stage. Two distinctions are particularly important. First, assigning learners to groups does not by itself constitute authentic cooperative learning. Second, successful group performance does not demonstrate that every learner has participated meaningfully or achieved individual learning. Figure 1 therefore serves as a theoretical lens for interpreting the evidence rather than as an empirical conclusion derived from the review findings.

From Motor Participation to Inclusive Participation

Self-determination theory explains how cooperative environments may influence continued engagement. Autonomy is supported when learners participate in decisions; competence when tasks and feedback make improvement visible; and relatedness when peers provide recognition and support. Yet satisfaction and frustration can coexist. A learner may feel socially connected while experiencing low competence because a more skilled peer controls the task, or may improve technically while feeling excluded from decision-making. Motor and social outcomes must therefore be assessed together (Deci & Ryan, 2000; Ryan & Deci, 2020; Vansteenkiste et al., 2020).

Movement competence also carries social meaning. Higher-skilled learners may receive more passes, leadership opportunities, and peer attention, whereas lower-skilled learners may be confined to peripheral roles. Heterogeneous grouping can redistribute expertise, but status differences may persist unless tasks recognize multiple forms of contribution and teachers actively protect participation equity. Group size, friendship, ability composition, role distribution, task complexity, and tutor preparation should

consequently be treated as design variables rather than administrative details (Cohen, 1994; Lafont et al., 2017).

Related evidence from collaborative learning outside physical education further cautions against assuming that one grouping structure is universally optimal. Learners with lower prior knowledge may productively resolve uncertainty within homogeneous groups, while explicit communication training can improve collaborative processes without necessarily producing equivalent gains in individual knowledge. These findings suggest that the relevant mechanism is not simply access to a more capable peer, but the quality of explanation, comparison, questioning, responsiveness, and uptake within interaction (Jurkowski et al., 2024; Mesghina et al., 2024).

Pedagogical Tensions, Equity Risks, and Implementation Challenges

Cooperative learning in physical education is ecological because tasks, equipment, time, teacher behavior, student histories, and peer relations interact. Model fidelity matters: an authenticated unit includes the defining cooperative structures, whereas selective group work may retain teacher control or allow dominance by skilled students. Apparent inconsistency across studies may therefore reflect implementation differences rather than failure of the underlying theory (Casey et al., 2015; Dyson et al., 2010).

Inclusion must also be interpreted in relation to identity, agency, and power. Transformative social-emotional learning argues that relational competence should enable learners to recognize and challenge inequity, not merely behave politely. Primary students describe cooperation through kindness, helping, and teaching one another, but conflict and exclusion still require dialogue, accountability, and opportunities to repair harm. Restorative perspectives therefore complement cooperative structures by addressing what happens when interdependence breaks down (Dyson et al., 2020; Hemphill et al., 2021; Jagers et al., 2019).

Taken together, these theoretical perspectives support an a priori explanatory pathway in which cooperative structures organize peer interaction and shared regulation; these interactions shape opportunities for practice, observation, feedback, decision-making, and contribution; and learners' experiences of competence, relatedness, responsibility, agency, and psychological safety influence their participation. Repeated participation may subsequently be associated with motor, motivational, relational, and inclusive outcomes. This pathway does not assume that cooperation produces these outcomes automatically. Rather, it identifies the conditions and mechanisms that the review examines across the included studies. Cooperation becomes potentially inclusive when task accessibility, individual accountability, meaningful movement, equitable contribution, and responsive teacher facilitation operate together.

Method

Search Strategy

This systematic review was conducted and reported with reference to the PRISMA 2020 statement, with search reporting informed by PRISMA-S and methodological decisions guided by the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2024; Page et al., 2021; Rethlefsen et al., 2021). Scopus was used as the sole bibliographic database because the review was designed to capture interdisciplinary scholarship at the intersection of education, physical activity, and cooperative learning.

The search was conducted on 13 July 2026 using the following exact Scopus query: TITLE-ABS-KEY (("cooperative learning" OR "peer-assisted learning") AND ("physical activity" OR exercise*) AND (student* OR learner* OR education OR school*)). No supplementary Boolean search terms were used. Terms such as Jigsaw, Team Games Tournament, physical education, movement, sport, dance, fitness, motivation, responsibility, peer relationships, and social inclusion were not added to the database query; instead, these concepts informed eligibility assessment, data extraction, and thematic synthesis.

The initial Scopus search returned 1,177 records before application of the publication-year criterion. A total of 495 records published before 2017 were excluded, leaving 682 records published from 2017 to 2026. Database restrictions were then applied sequentially: Social Sciences (512 records), article document type (446), English language (399), journal source type (399), and open-access availability (198).



The English-language and open-access restrictions were pragmatic scope decisions and were not treated as indicators of methodological quality. Their implications are considered in the Discussion.

Intervention descriptions were extracted with attention to the principles of the Template for Intervention Description and Replication and to implementation-fidelity concepts, including the extent to which defining cooperative-learning structures were identifiable in the study reports (Hoffmann et al., 2014; O'Donnell, 2008).

Eligibility Criteria

Studies were eligible when participants were children, adolescents, university students, preservice or in-service teachers, or learners with diverse educational or support needs, and when the learning context involved physical education, school sport, dance, motor-skill learning, fitness, outdoor learning, university activity courses, teacher education, or other activity-based settings in which movement was integral to learning.

Eligible interventions used a structured cooperative or peer-assisted learning approach, including reciprocal peer learning, jigsaw, Team Games Tournament, or another design in which learners were responsible for supporting one another's learning toward shared goals. Studies based only on unstructured group work, cooperative games without a learning objective, or group exercise without shared learning goals were excluded.

Outcome concepts included movement competence, sport skills, physical activity, fitness, academic learning time, motivation, enjoyment, self-efficacy, responsibility, communication, empathy, peer relationships, belonging, equity, inclusion, and teacher competence. These concepts served as eligibility, extraction, and synthesis criteria rather than supplementary database search terms.

Randomized, cluster-randomized, quasi-experimental, nonrandomized intervention, longitudinal, observational, mixed-methods, qualitative, action-research, and implementation studies were eligible. Editorials, protocols, conceptual papers without empirical data, conference abstracts without sufficient data, dissertations outside the peer-reviewed journal literature, and review articles were excluded from the primary synthesis.

Methodological Quality and Risk-of-Bias Assessment

Methodological quality and risk of bias were appraised using tools aligned with study design. Randomized and cluster-randomized trials were assessed using RoB 2; nonrandomized intervention studies were assessed using ROBINS-I; and qualitative, quantitative descriptive, quantitative nonrandomized, and mixed-methods studies were assessed using design-specific criteria from the Mixed Methods Appraisal Tool (MMAT) where appropriate (Hong et al., 2018; Sterne et al., 2016).

RoB 2 judgments were reported as low risk, some concerns, or high risk of bias. ROBINS-I judgments were reported as low, moderate, serious, critical, or no information. MMAT findings were reported at the criterion level rather than converted into an unsupported global numerical score. Eight studies were assessed using RoB 2, 15 using ROBINS-I, and 13 using MMAT criteria. Appraisal findings were used to qualify interpretation rather than as an automatic basis for study exclusion. Detailed study-level and domain-level judgments are provided in Appendix A.

Screening, Study Selection, Data Extraction, and Synthesis

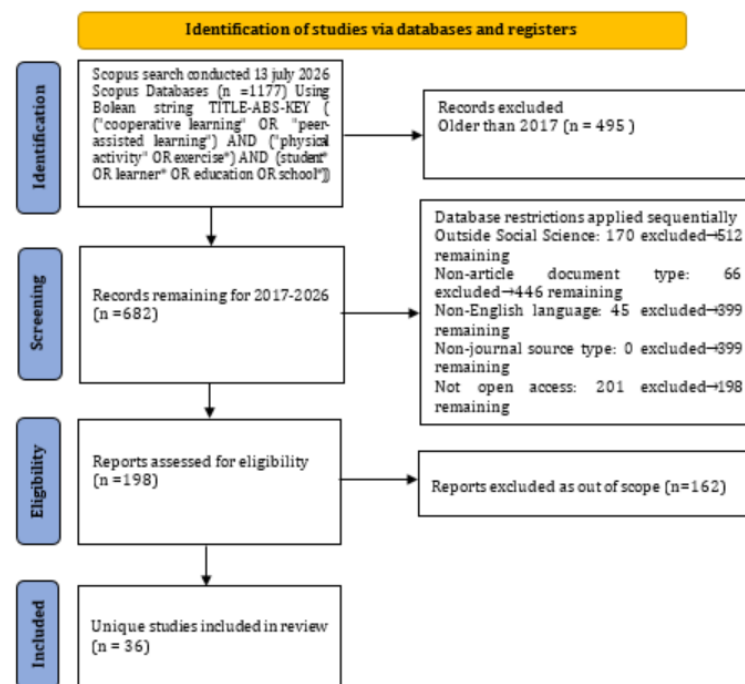
After the year criterion and database restrictions described above, 198 records remained for scope and eligibility assessment. Of these, 162 were excluded as outside the predefined scope, leaving 36 unique studies in the final synthesis. No duplicate records, automated exclusions, or retrieval failures were recorded in the documented selection process. Figure 2 presents the full sequence from identification to inclusion.

A structured extraction framework was used to record participant characteristics, educational setting, activity/content, cooperative-learning structure, comparison condition, duration, outcomes, measurement approach, principal findings, implementation characteristics, and methodological considerations. Data were then organized according to four synthesis domains: (1) movement competence, sport skills, and active learning time; (2) physical participation, motivation, enjoyment, and engagement; (3) peer

relationships, responsibility, and social-emotional development; and (4) inclusion, equity, and conditions for meaningful participation. Because individual studies could contribute evidence to more than one domain, cumulative table placements exceed the 36 unique included studies.

Substantial heterogeneity in participants, intervention designs, activity types, outcome measures, and study methodologies precluded a pooled effect estimate. The evidence was therefore synthesized narratively, with reporting informed by guidance for synthesis without meta-analysis (Campbell et al., 2020). Primary-study findings were distinguished from reviewer interpretation, and external reviews or contextual literature were used only to situate the synthesis. Where relevant, the methodological credibility of external reviews was considered with reference to AMSTAR 2 and ROBIS principles (Shea et al., 2017; Whiting et al., 2016).

Figure 2. PRISMA flow diagram of study identification, screening, eligibility assessment, and inclusion.



Results

Methodological appraisal indicated substantial variation in the strength of the included evidence. Eight randomized or cluster-randomized studies were assessed using RoB 2. Seven received an overall judgment of some concerns, whereas one study was judged to be at high risk of bias. The most frequent concerns involved insufficient reporting of random-sequence generation and allocation concealment, uncertainties related to cluster recruitment, outcome measurement, and the absence of prospectively available analysis plans.

Fifteen nonrandomized intervention studies were assessed using ROBINS-I. Twelve were judged to be at serious risk of bias, two at moderate risk of bias, and one had insufficient information for a reproducible overall judgment. Confounding represented the most common concern, particularly in studies using intact classes, non-equivalent comparison groups, one-group pretest-posttest designs, or interventions in which teacher, cohort, or group characteristics were associated with treatment allocation. Some studies also presented concerns related to missing data, outcome measurement, and selective reporting.

Thirteen qualitative, quantitative descriptive, quantitative nonrandomized, or mixed-methods studies were assessed using design-specific MMAT criteria. Most qualitative studies satisfied the principal

methodological criteria, although their findings remained context dependent and several involved researcher-participant or teacher-researcher relationships requiring interpretive caution. Quantitative descriptive and mixed-methods studies showed greater uncertainty regarding representativeness, non-response, clustering, sampling, or analytic denominators. Detailed study-level and domain-level judgments are reported in Appendix A. These methodological assessments were considered when interpreting the direction and strength of findings across the four synthesis domains.

Movement Competence and Skill Development Through Cooperative Practice

Ten studies contributed evidence on movement competence, sport-specific skills, or academic learning time. The direction of findings was generally favorable, but confidence varied according to design and risk of bias. In secondary volleyball, Team Games Tournament instruction was associated with greater academic learning time and advantages for selected knowledge and skill outcomes relative to direct instruction (Akkaya & Mirzeoğlu, 2024). A football study using Team Games Tournament also reported pre-post technical-skill gains, although its one-group design limits attribution of change to the intervention (Budi et al., 2025).

In soccer learning, structured verbal interaction between peers was associated with clearer gains in overall game performance than cooperation without verbal interaction (Khalifa et al., 2020). Basketball studies likewise reported favorable skill outcomes under cooperative structures, including Student Teams Achievement Divisions and cooperative learning combined with concept mapping, although methodological limitations reduced certainty regarding the magnitude of these effects (Faozi et al., 2024; M.-Y. Huang et al., 2017). A gymnastics trial reported higher post-intervention performance under cooperative mastery learning, but the small all-male sample and incomplete reporting of randomization procedures warrant caution (Khataybeh et al., 2024).

Other studies suggest that cooperative learning can influence conceptual and motor outcomes through different pathways. Guzmán & Payá (2020) reported stronger conceptual learning and retention under cooperative learning without a corresponding increase in physical performance time. A cluster-randomized circuit-game intervention reported gains in fundamental motor skills and social-emotional learning, although RoB 2 appraisal identified some concerns (Kuspratiwi et al., 2026). Positive skill changes were also reported in basketball and soccer throw-in studies, but the evidence was weakened by serious or moderate risk of bias in the nonrandomized designs (Habib & Al-Okbi, 2020; Hadi AlAridhee et al., 2023). Overall, the evidence most defensibly supports cooperative learning when peer interaction remains closely connected to repeated individual practice, technically relevant feedback, and valid assessment of skill development.

Table 1. Cooperative-learning interventions and outcomes related to movement competence, sport skills, and academic learning time

References	Participants and setting	Activity/content	Cooperative structure/comparator	Duration	Outcomes	Main findings	Methodological considerations
Akkaya & Mirzeoğlu (2024)	Eighth-grade students, Türkiye; sample NR	Volleyball	TGT vs direct instruction	8 weeks	Learning time, knowledge, passing, serve	Learning time 30.86% vs 17.12%; advantages for knowledge and selected skills	Cluster-level comparative intervention; random allocation incompletely described
Budi et al. (2025)	80 students aged 15–17	Football techniques	TGT; no non-cooperative comparator	16 meetings	Yeagley Football Battery	Significant pre-post technical-skill improvement	Control group not identified
Khalifa et al. (2020)	30 ninth-graders, Tunisia	Soccer skills/game performance	Cooperation with vs without verbal interaction	12 lessons	Skills, decisions, support, game involvement	Only verbal-interaction group improved overall game performance	Small, sex-imbalanced sample
Faozi et al. (2024)	75 seventh-graders	Basketball	STAD vs direct teaching	NR	Passing, shooting, dribbling	Greater improvement under STAD	Duration and fidelity not reported
M.-Y. Huang et al. (2017)	170 fifth-graders	Basketball	Cooperative vs concept mapping vs control	NR	Basketball and critical thinking	Both active interventions exceeded control	Cooperative components insufficiently detailed
Khataybeh et al. (2024)	36 male PE students	Gymnastics	Cooperative mastery vs standard training	6 weeks/12 sessions	Four floor skills, total competence	Total score 17.61 vs 13.50; gains across skills	Small all-male single-site sample

Guzmán & Payá (2020)	75 children aged 10–12	Traditional/world games	Cooperative vs direct instruction	Two units; 6-month follow-up	Conceptual learning, retention, active time	Better learning and retention; similar performance time	Motor acquisition not primary outcome
Kuspratiwi et al. (2026)	192 students aged 9–10	Circuit games	Cooperative circuits vs regular PE	12 weeks	Locomotor, object control, SEL	All domains improved; partial $\eta^2 = .34$	>One session weekly
Habib & Al-Okbi (2020)	48 female middle-school students	Basketball	Sensory-adapted cooperation vs usual curriculum	NR	Selected basic skills	Greater improvement in cooperative condition	Reporting and allocation unclear
Hadi AlAridhee et al. (2023)	22 university PE students	Soccer throw-in	Cooperation with vs without device	NR	Throw-in performance	Both improved; device-supported group improved more	No non-cooperative condition

Physical Participation, Motivation, and Active Engagement

Ten studies contributed evidence on physical participation, motivation, enjoyment, or engagement. Cross-sectional evidence indicated that individual accountability was strongly associated with task- and self-approach goals, but the design does not permit causal inference (Rivera Pérez et al., 2021). A youth-athletics intervention reported improvements in motivational climate, peer relationships, and self-concept without an advantage in standardized physical tests, illustrating that psychosocial and physical outcomes may diverge (Železnik Mežan et al., 2025). Observational work in primary physical education similarly showed that learners valued challenge, differentiation, and voice, while explicitly cooperative practices were comparatively infrequent in everyday lessons (Adank et al., 2024).

Sustained cooperative units increased intrinsic motivation and identified regulation, while AI-facilitated peer assistance improved skill performance, autonomy, competence, and relatedness relative to conventional peer assistance (Fernandez-Rio et al., 2017; Hsia et al., 2025). The latter result suggests that digital tools are most valuable when they improve peer feedback rather than replace interaction.

Objective activity evidence was more conditional. Jigsaw reduced sex differences in moderate-to-vigorous physical activity, but effects depended on habituation and continuity across activity sequences (Drouet et al., 2024). Pedometer-supported cooperation increased post-test activity more than self-management alone, although fitness did not differ and activity gains declined at follow-up (C.-H. Huang et al., 2025). A small female-football study reported a 13.63% motivational increase but lacked a comparison group (Ridwan et al., 2022). Hybrid approaches combining cooperation with Teaching Games for Understanding or gamification strengthened task orientation and autonomy support, yet attribution to cooperation alone remained difficult (Chiva-Bartoll et al., 2018; Flores-Aguilar et al., 2025). Table 2 therefore supports motivational benefits more consistently than durable changes in physical activity or fitness.

Table 2. Effects of cooperative learning on physical participation, motivation, enjoyment, and engagement

References	Participants/context	Activity/model	Physical measure	Motivational/affective measure	Key outcomes	Moderators/mechanisms	Methodological considerations
Rivera Pérez et al. (2021)	1,292 students aged 10–19	PE; perceived cooperative factors	None objective	3×2 approach goals	Responsibility strongest predictor of task/self goals	Individual accountability	Cross-sectional self-report
Železnik Mežan et al. (2025)	157 youth athletes; 12 trainers	Three cooperative units vs direct instruction	Four standardized tests	Climate, peer relations, self-concept	Psychosocial gains; no physical-test advantage	Verified fidelity	Unit duration not reported
Adank et al. (2024)	24 children; 31 observed lessons	Everyday primary PE	Observation	Enjoyment perspectives	32 enjoyable practices; cooperation rarely observed	Challenge, differentiation, voice	Exploratory, not intervention
Fernandez-Rio et al. (2017)	249 grade 8–11 students	Three cooperative units vs traditional teaching	None objective	Intrinsic motivation and regulation	Only cooperative group improved key motivation outcomes	Sustained exposure, relatedness	Intact-class quasi-experiment
Hsia et al. (2025)	90 university students	AI-supported vs conventional	Somatic skill assessment	Autonomy, competence,	AI-supported condition superior	Feedback quality	AI added value, not peer



		peer assistance		relatedness, motivation	across outcomes		learning vs no peer learning
Drouet et al. (2024)	254 secondary students	Jigsaw vs control across sequences	MVPA	No direct motivation scale	Smaller sex differences in MVPA	Sex and habituation	Context-sensitive effects
C.-H. Huang et al. (2025)	47 adolescents	Cooperation + pedometer self-management vs pedometer only	Pedometer and PACER	Goal/self-management process	Higher post-test activity; no fitness difference; decline at follow-up	Duration and retention	Small quasi-experiment
Ridwan et al. (2022)	20 female grade-11 students	Cooperative small-sided football	Participation, not intensity	Motivation questionnaire	Motivation rose 13.63%	Gendered activity context	One-group design
Chiva-Bartoll et al. (2018)	96 adolescents	TGFU + cooperation vs traditional handball	None objective	Task/ego climate	More task-oriented climate	Hybrid tactical-cooperative design	Unequal groups; model effects inseparable
Flores-Aguilar et al. (2025)	132 PE teacher-education students	Gamified-cooperative, cooperative, traditional	None	Goals, needs, autonomy support	Reduced comparison; improved autonomy support	Gamification modified effect	Different intervention lengths

Peer Relationships, Responsibility, and Social-Emotional Development

Ten studies contributed evidence on peer relationships, responsibility, empathy, prosocial behavior, or broader social-emotional development. Inclusive-dance research described movement, music, physical contact, and group activity as channels for communication and cooperative skill development in early childhood, although the findings were based primarily on adult-reported qualitative data (Llorens Gómez et al., 2024). In secondary team activities, learners could articulate inclusive values while reproducing exclusionary behavior during play, indicating that stated norms and enacted participation may differ (Hovdal et al., 2021).

Interdisciplinary cooperative activities were associated with stronger perceptions of peer relationships and social or academic attitudes, but sequential task exposure and self-report measures limited causal inference (Bassachs et al., 2022). Action-research evidence showed that progressive transfer of responsibility could increase students' active roles, although novice-teacher implementation required substantial support (Silva et al., 2021). In youth sport, repeated coach-player communication across a season was interpreted as a mechanism through which teamwork and shared learning developed over time (Arumí-Prat & Pla-Campas, 2025).

Sustained cooperative units were associated with motivational improvement across primary and secondary stages, while changes in social interaction were clearer among secondary learners; because all groups experienced cooperative learning, time-related and stage-related explanations cannot be separated cleanly (Hortigüela Alcalá et al., 2019). Longitudinal qualitative work across 24 lessons similarly described a gradual shift from reluctance toward more productive and inclusive cooperation (Bjørke & Mordal Moen, 2020). Empathy and tolerance gains were reported in cooperative physical education, but the nonrandomized design carried serious confounding concerns (Winarni & Rutan, 2020). Youth-athletics and cooperative-circuit studies also reported favorable psychosocial outcomes, although their overall RoB 2 judgments were high and some concerns, respectively (Kuspratiwi et al., 2026; Železnik Mežan et al., 2025). Taken together, the evidence supports social-emotional development as a plausible and recurring outcome of structured cooperation, but the strength of inference remains design dependent.

Table 3. Cooperative learning and the development of peer relationships, responsibility, and social-emotional competencies

References	Learner group/activity	Cooperative structure	Social-emotional constructs	Data collection	Mechanisms	Principal findings	Limitations
Llorens Gómez et al. (2024)	Early childhood; inclusive dance	Movement, music, contact, group activity	Interaction, communication, cooperation	Interviews, discussion groups, field notes	Embodied communication and organization	Improved student interaction and cooperative skills	Adult-reported case study



Hovdal et al. (2021)	Two secondary classes; team activities	Rules plus facilitation/reflection	Inclusion, passing, feedback	Narratives, interviews, observation, video	Experience followed by reflection	Students opposed yet reproduced exclusion	Small qualitative setting
Bassachs et al. (2022)	Preservice teachers; math/physical activities	Multimodal positive interdependence	Peer relations, social/academic attitudes	Validated questionnaire	Interaction and multimodality	Stronger peer relations and judgment	Self-report; duration NR
Silva et al. (2021)	25 high-school students; one novice teacher	Gradual action-research implementation	Responsibility and active roles	Three qualitative methods	Progressive responsibility transfer	More student responsibility; substantial support needed	Single class
Arumí-Prat & Pla-Campas (2025)	Youth sport across season	Cooperative coaching communication	Teamwork and shared learning	69 conversations/23 matches	Repeated coach-player dialogue	Teamwork developed as social learning	Narrative/autoethnographic
Hortigüela Alcalá et al. (2019)	179 primary/secondary students	Three cooperative units	Motivation, interaction, respect	Mixed quantitative/qualitative	Sustained cooperation, stage	Motivation improved both; interaction only secondary	Convenience sample
Bjørke & Mordal Moen (2020)	Students across 24 lessons	Four six-week interventions	Attitudes, SEL, inclusive group work	Interviews, observations, diary	Prolonged exposure, adaptation	Reluctance shifted toward inclusive cooperation	Context-dependent action research
Winarni & Rutan (2020)	128 eighth-graders	Cooperative vs classical PE	Empathy and tolerance	Validated scales; factorial analysis	Social constructivist interaction	Cooperation superior for empathy/tolerance	Single cultural context
Železnik Mežan et al. (2025)	157 youth athletes	Three units vs direct instruction	Peer relations, self-concept, climate	Standardized questionnaires	Cooperative structure and fidelity	Improved psychosocial outcomes	No physical-test superiority
Kuspratiwi et al. (2026)	192 primary students	Five cooperative circuit stations	Prosocial behavior, difficulties	SDQ plus motor tests	Required cooperation and reflection	Prosocial gains; difficulties reduced	No long-term transfer

Inclusion, Equity, and Conditions for Meaningful Participation

Ten studies contributed evidence on inclusion, equity, or implementation conditions affecting meaningful participation. Among adults with intellectual disabilities, active time in cooperative physical activity was positively associated with quality of life, but the cross-sectional design does not establish causality (González-Valero et al., 2021). A one-year participatory action-research project showed that teachers could move toward more student-centred practice through repeated reflection and facilitation, while also documenting recurring implementation difficulties (Bjørke et al., 2023). In-service teacher training using scaffolded cooperative learning was associated with stronger professional knowledge, practical competence, and self-efficacy than direct instruction, with RoB 2 appraisal indicating some concerns (Jiang et al., 2023).

Grouping practices were particularly relevant to equity. Undergraduate learners with lower psychomotor competence sometimes experienced friendship groups as more supportive than heterogeneous groups, while mixed-gender jigsaw studies suggested that structured roles and mutual understanding can support equality-related outcomes (García-Taibo et al., 2024; O'Leary et al., 2019). Preservice-teacher evidence also indicated that explicit scaffolding can strengthen cooperative learning relative to less supported implementation (Legrain et al., 2019). Digital technology did not automatically improve cooperation: iterative teacher reflection and adaptation were needed before tablet-supported cooperative activity became pedagogically productive (Bodsworth & Goodyear, 2017).

University evidence further showed that group stability and task organization can be experienced differently by women and men, while quantitative descriptive limitations constrain generalization (Baena-Morales et al., 2020). Jigsaw-based physical education reduced sex differences in moderate-to-vigorous physical activity only under some activity sequences and levels of habituation, and the nonrandomized design carried serious risk of bias (Drouet et al., 2024). Qualitative evidence also showed that formal rules intended to promote inclusion did not prevent exclusionary behavior unless experience was accompanied by reflection and facilitation (Hovdal et al., 2021). Across these studies, inclusion was best understood as a layered construct involving task access, active participation, peer

recognition, meaningful contribution, learning equity, and belonging rather than physical presence alone.

Table 4. Inclusion, equity, and implementation conditions in cooperative activity-based learning

References	Population/inclusion dimension	Activity and grouping	Adaptation/supplement	Inclusion/implementation outcomes	Barriers/facilitators	Main findings	Evidence limitations
González-Valero et al. (2021)	156 adults with intellectual disabilities	Cooperative physical activity	Activity bands; demographic modeling	Active time, quality of life, BMI	Access to activity	Active time positively related to quality of life	Cross-sectional
Bjørke et al. (2023)	PE teachers shifting pedagogy	One-year participatory action research	Facilitation, reflection, repeated cycles	Professional growth and student-centred practice	Theory, community, duration; recurring difficulties	Practice became more student-centred	Small contextual project
Jiang et al. (2023)	72 in-service PE teachers	Mixed-sex Jigsaw; scaffolded CL, CL, DI	Instructor scaffolding	Knowledge, skills, PCK, self-efficacy	Scaffolding and mixed groups	Cooperative conditions exceeded DI; scaffolding strongest	Regional short training
O'Leary et al. (2019)	36 undergraduates with varied psychomotor ability	Jigsaw gymnastics/dance; heterogeneous/friendship groups	Grouping matched to task/ability	Empathy and perceived learning	Friendship groups aided lower-skilled learners	Both groups supported social/cognitive learning	Perception-based case study
Legrain et al. (2019)	69 preservice PE teachers	Jigsaw, scaffolded Jigsaw, DI	Explicit instructional support	Motor, practical/pedagogical knowledge, self-efficacy	Scaffolding	Cooperative conditions improved knowledge/performance	Three two-hour sessions
García-Taibo et al. (2024)	60 Sport Sciences students; equal sex distribution	Seven mixed-gender Jigsaw volleyball lessons	Role distribution	Gender equality and cooperative dimensions	Mutual understanding	Improved 2/3 equality and 5/7 cooperative dimensions	Brief small sample
Bodsworth & Goodyear (2017)	36 pupils/two classes	iPad-supported cooperative athletics	Action research and iterative redesign	Technology use and group cooperation	Initial unfamiliarity; reflection facilitated change	Pedagogical model alone insufficient	Single teacher-researcher
Baena-Morales et al. (2020)	177 university students	Aronson Jigsaw	Gendered grouping preferences	Social competence and perceived value	Women preferred stability/structure	Both sexes valued social competence	Post-activity perceptions
Drouet et al. (2024)	254 secondary students; sex equity	Jigsaw across activity sequences	Repeated exposure	Sex differences in MVPA	Habituation and continuity	Jigsaw reduced sex gap conditionally	Equity measured only through MVPA
Hovdal et al. (2021)	Secondary students; team inclusion	Team activities with cooperative principles	Rules, prompts, reflection	Inclusive conduct and understanding	Rules insufficient; reflection necessary	Students reproduced exclusion despite stated values	Qualitative; model not experimentally tested

Discussion

The findings indicate that cooperative learning is associated with movement, motivational, social-emotional, and inclusive outcomes across activity-based learning, but these effects should not be treated as uniform or automatically causal. The included studies showed that improvements in motor performance and motivation can occur together, yet several interventions reported psychosocial benefits without corresponding advantages in physical performance. This pattern is consistent with related action-skill and physical-education research showing that cooperative structures cannot replace sufficient, technically appropriate practice (Luo et al., 2020; Yang et al., 2021). The evidence therefore suggests that cooperative learning is most educationally useful when interaction supports the quality, density, and self-regulation of practice rather than reducing opportunities for individual movement.

The methodological appraisal reinforces the need for cautious interpretation. Most randomized studies were judged to have some concerns, while a substantial proportion of nonrandomized intervention studies were judged to have a serious risk of bias, particularly because of confounding, intact-class allo-



cation, one-group designs, and incomplete reporting. Qualitative studies were generally methodologically appropriate for examining experience, interaction, and implementation, but their findings were necessarily context dependent. Accordingly, the review provides stronger support for recurring patterns and plausible pedagogical mechanisms than for precise causal estimates of effect.

Figure 3. Mechanisms through which cooperative practice may influence movement competence and sport-skill development.

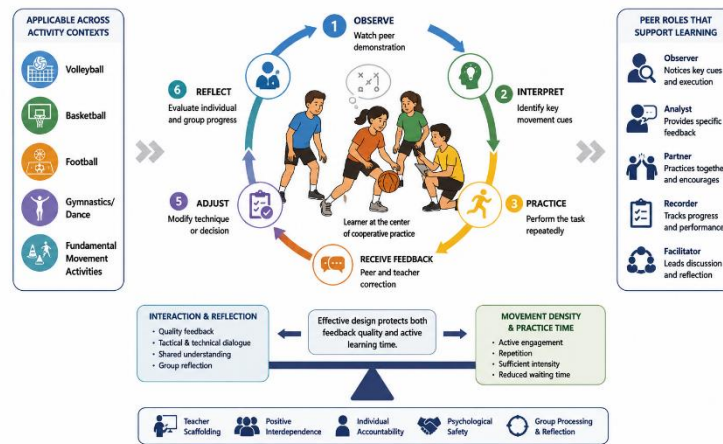


Figure 3 synthesizes the mechanisms most consistently associated with movement and sport-skill outcomes in the reviewed evidence. Learners may observe peer demonstrations, identify technical or tactical cues, perform movements repeatedly, receive feedback, adjust execution or decision-making, and reflect on individual and group progress. These processes can operate across volleyball, basketball, football, gymnastics, dance, and fundamental movement activities, although their value depends on task design and assessment criteria. Complementary roles such as observer, analyst, practice partner, recorder, and facilitator can distribute responsibility and create multiple forms of contribution. However, the evidence also shows a practical tension between interaction and movement density. Excessive discussion, waiting, or role imbalance may reduce active practice, whereas continuous movement without accurate feedback may limit technical learning. Teacher scaffolding, individual accountability, positive interdependence, and group processing therefore appear important for maintaining both feedback quality and sufficient practice time.

Physical participation and motivation followed related but distinct pathways. Cooperative environments were often associated with stronger mastery orientation, relatedness, responsibility, and autonomous motivation, whereas effects on physical activity intensity and fitness were less consistent. Educational stage and social context also appeared to shape these outcomes. Sustained units were associated with motivational improvement across age groups, while changes in social interaction were clearer among some secondary-school learners. Empathy and tolerance outcomes further suggest that physical education can provide a setting for relational and moral learning, although differences in class composition, developmental stage, and prior achievement limit universal conclusions (Hortigüela Alcalá et al., 2019; Winarni & Rutan, 2020). Motor participation and social inclusion may reinforce one another when competence increases confidence and access to meaningful roles, but low competence can also heighten dependence on peers or increase learners' visibility in ways that are not experienced positively. Recent evidence provides additional contextual support for the relationship between physical and motivational outcomes. In an eight-week quasi-experimental study involving secondary-school students, peer-based cooperative teaching was associated with improvements in physical-fitness components and learning motivation relative to traditional instruction (Jamhour, 2026).

Figure 4. Pathways linking cooperative-learning design with physical participation, motivation, and active engagement.

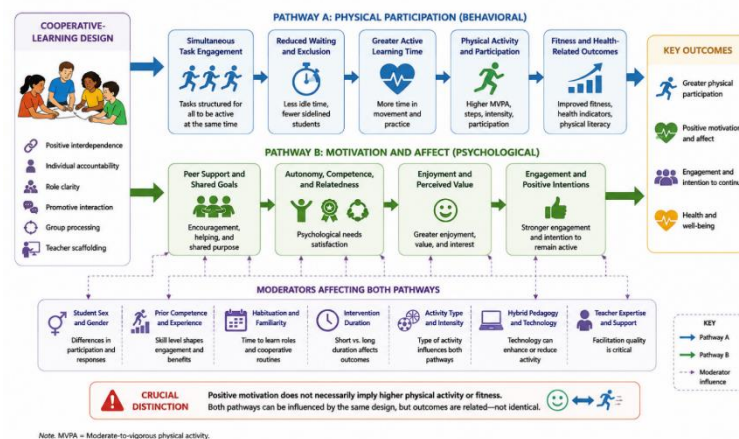


Figure 4 distinguishes a behavioral pathway from a psychological pathway. In the behavioral pathway, task organization can allow several learners to move simultaneously, potentially reducing waiting time and peripheral participation. Greater active learning time may then support movement participation, moderate-to-vigorous physical activity, and fitness-related outcomes. In the psychological pathway, peer support, shared goals, and opportunities for autonomy, competence, and relatedness may strengthen enjoyment, perceived value, engagement, and intentions to remain active. The review shows that these pathways should not be treated as interchangeable. Learners may report greater enjoyment or relatedness without showing higher activity intensity or superior fitness, while greater movement time does not necessarily indicate a positive motivational experience. Sex and gender, prior competence, familiarity with cooperative routines, intervention duration, activity type, technology, hybrid pedagogies, and teacher expertise may alter both pathways. Physical participation and motivation should therefore be assessed as related but separate outcomes.

Responsibility emerged as both a potential mechanism and an educational outcome. Studies involving progressive transfer of decision-making showed that learners could assume more active roles over time, but teachers often needed sustained preparation and support to manage this transition. Related research also shows that teachers adapt cooperative learning to local curricula and institutional cultures and may omit defining elements when implementation demands exceed available time, knowledge, or support. Professional and pedagogical competence may therefore explain part of the variation across interventions because teachers must simultaneously organize movement, monitor individual learning, manage peer relationships, and preserve active learning time (Geletu, 2022; Karmina et al., 2021). Recent work reinforces the need to assess implementation explicitly rather than infer it from the cooperative-learning label alone. Martínez Benito et al. (2025) developed and initially validated a questionnaire designed to evaluate the implementation of cooperative learning in physical education from the teacher perspective, supporting the treatment of implementation quality as a measurable dimension when interpreting pedagogical outcomes.

Communication also appeared to be developmental rather than immediate. Season-long youth-sport evidence described teamwork as emerging through repeated dialogue before, during, and after performance. Small-sided football may support girls' motivation, while interdisciplinary cooperative tasks may provide different opportunities for cognitive, physical, organizational, and interpersonal contribution. Nevertheless, short-term motivational gains or positive attitudes do not by themselves demonstrate equitable participation (Arumí-Prat & Pla-Campas, 2025; Ridwan et al., 2022). Future studies should therefore combine learner reports with direct measures of activity, interaction, role distribution, and participation.

Figure 5. Development of peer relationships, responsibility, and social-emotional competence through structured cooperative activity.

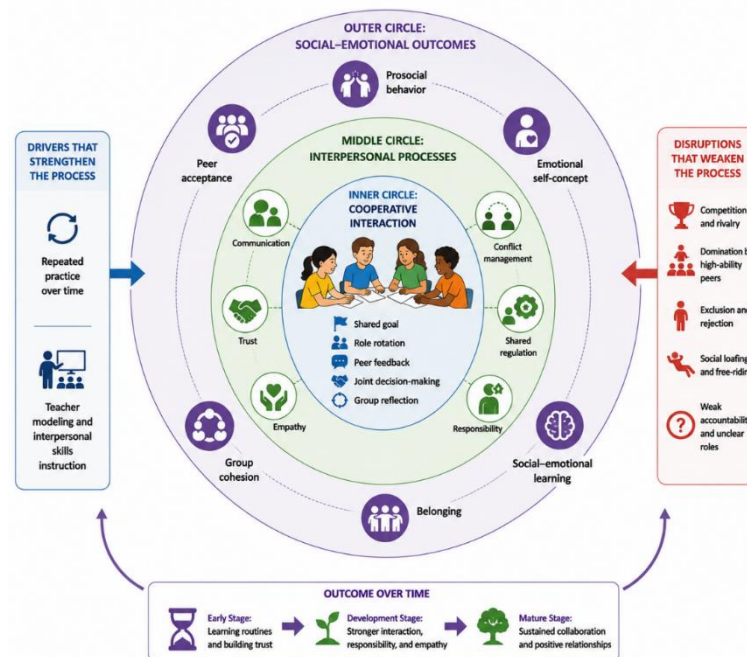


Figure 5 interprets social-emotional development as a layered process that develops through repeated, structured interaction. Shared goals, rotating roles, peer feedback, joint decision-making, and group reflection can create opportunities for communication, trust, empathy, conflict management, shared regulation, and responsibility. When these processes are practiced over time, they may contribute to peer acceptance, prosocial behavior, emotional self-concept, group cohesion, and belonging. The included evidence also indicates that such development is rarely immediate. Learners may initially struggle with roles, trust, or conflict before developing more productive forms of cooperation. Teacher modeling and explicit instruction in interpersonal skills can support this progression. Conversely, competition, domination by higher-skilled peers, social loafing, unclear roles, and weak accountability may interrupt it. Group activity should therefore not be interpreted as inherently socially beneficial.

Group composition further requires contextual judgment. Friendship groups may protect psychological safety for learners with lower psychomotor competence, whereas heterogeneous groups may broaden interaction and distribute expertise when status differences are actively managed. Gender-related preferences for stable groups and task organization also indicate that formally identical cooperative structures can be experienced differently by different learners (Baena-Morales et al., 2020; O'Leary et al., 2019). Post-search contextual evidence from Chilean school physical education similarly suggests that cooperative-learning dimensions vary by educational level, grade, and sex (Pino & Saavedra, 2026). Equitable grouping should therefore be treated as a dynamic pedagogical decision linked to task demands, learner vulnerability, developmental context, and role rotation rather than as a one-time administrative choice.

Hybrid models create additional opportunities but complicate causal interpretation. In the included studies, cooperative learning was sometimes combined with gamification, artificial intelligence, Teaching Games for Understanding, digital feedback, or self-management. In these cases, favorable outcomes cannot always be attributed to cooperation alone. Complementary literature outside the primary synthesis similarly suggests that gamified cooperation may support engagement, interprofessional peer learning can connect knowledge across domains, and adaptive support systems can integrate digital, teacher, and peer assistance. Cross-disciplinary studies also report generally positive perceptions of cooperation while emphasizing substantial dependence on implementation (Cañabate et al., 2020; Manzano-León et al., 2023; Ponomariovienė & Jakavonytė-Staškuvienė, 2025; Zhang et al., 2026). Cooperative learning is therefore better interpreted as an organizing pedagogical architecture that can be combined with other approaches, provided its defining mechanisms remain identifiable.

Related evidence from sustainability education, flipped learning, and integrated STEM also emphasizes reflection, self-efficacy, and professional development. These studies are not part of the primary activity-based synthesis but provide contextual support for the broader proposition that collaborative learning depends on learners' readiness, technological self-efficacy, and teachers' attitudes toward innovation. Targeted professional learning may therefore be more important than teaching experience alone when educators introduce unfamiliar cooperative or blended approaches (Li et al., 2017; Poolkrajang & Papanai, 2026; Thibaut et al., 2019). Evidence from physical education further suggests that highly structured cooperation is more consistently associated with prosocial outcomes than loosely organized group work, supporting the use of explicit roles, accountability, communication protocols, and group processing (González et al., 2023).

Taken together, the findings support the development of an Inclusive Cooperative Activity-Based Learning Framework. The framework integrates five connected layers. Foundational structures include positive interdependence, individual accountability, equitable task access, role rotation, and promotive interaction. Pedagogical supports include teacher scaffolding, communication training, adaptive task design, reciprocal feedback, and group processing. These structures and supports may activate mediating processes such as movement opportunity, competence, relatedness, shared regulation, responsibility, and psychological safety. These processes, in turn, shape more immediate experiences of practice, engagement, peer support, enjoyment, and meaningful contribution. When such experiences are repeated under supportive conditions, they may contribute to motor competence, sustained participation, self-efficacy, prosocial behavior, belonging, and social inclusion. Recent meta-analytic evidence is broadly favorable but heterogeneous, further supporting the need to interpret outcomes in relation to fidelity, intervention duration, methodological quality, and outcome domain (Boke et al., 2025).

Figure 6. Inclusive Cooperative Activity-Based Learning Framework: conditions for equitable access, meaningful contribution, competence development, and belonging.

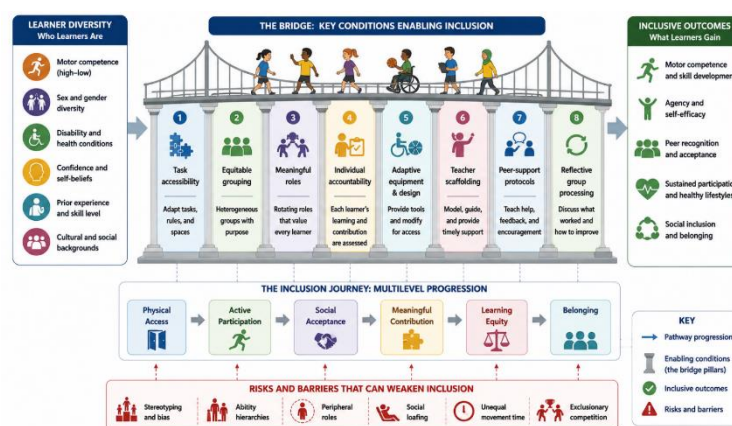


Figure 6 conceptualizes inclusion as a progression from physical access to belonging rather than as simple presence within an activity. Learners enter activity-based settings with differences in motor competence, sex and gender, disability, health status, confidence, prior experience, and cultural or social background. The framework identifies task accessibility, equitable grouping, meaningful roles, individual accountability, adaptive equipment and task design, teacher scaffolding, peer-support protocols, and reflective group processing as conditions that can support progression through physical access, active participation, social acceptance, meaningful contribution, learning equity, and belonging. These conditions may contribute to motor and skill development, agency, self-efficacy, peer recognition, sustained participation, and social inclusion. At the same time, stereotyping, ability hierarchies, peripheral roles, social loafing, unequal movement time, and exclusionary competition can undermine inclusion even when learners are formally assigned to cooperative groups. Inclusive cooperative learning should therefore be understood as the deliberate creation of conditions in which learners can move, contribute, develop competence, influence collective activity, and experience recognition within the group.

The review has several limitations. First, the literature search relied solely on Scopus. Although Scopus provides broad interdisciplinary coverage, the use of a single database may have missed studies indexed exclusively in education-, psychology-, health-, or sport-specific databases. Second, the review was restricted to English-language journal articles and open-access records. The open-access restriction reduced the eligible database pool substantially and may have introduced availability bias, while the language restriction may have excluded relevant evidence from other linguistic contexts. Third, the search used a deliberately bounded Boolean strategy and did not include additional terms such as Jigsaw, Team Games Tournament, physical education, movement, or social inclusion. Relevant studies that did not use the executed search terminology in their titles, abstracts, or keywords may therefore have been missed.

Fourth, the evidence base was methodologically heterogeneous. Many intervention studies used small or localized samples, intact classes, quasi-experimental allocation, short intervention periods, self-reported outcomes, incomplete implementation-fidelity assessment, or limited follow-up. The predominance of serious ROBINS-I judgments and the presence of concerns in most randomized studies reduce confidence in strong causal conclusions. Measures of inclusion were also inconsistent, ranging from physical-activity participation to perceived peer relationships, quality of life, gender equality, and belonging. This heterogeneity prevented a pooled meta-analytic estimate and required narrative synthesis across outcome domains.

Future research should use preregistered, multisite designs; clearly reported randomization procedures where appropriate; validated motor and inclusion measures; objective physical-activity monitoring; systematic interaction or social-network analysis; implementation-fidelity measures; and longitudinal follow-up. Studies should also distinguish physical presence from active participation, meaningful contribution, learning equity, and belonging. Cooperative learning should not be described as inherently inclusive. Its educational value depends on whether teachers and learners establish structures that provide active, equitable, and consequential opportunities to participate.

Conclusions

This systematic review indicates that cooperative learning is associated with movement, motivational, social-emotional, and inclusion-related outcomes across activity-based learning contexts, although the strength and consistency of evidence vary across domains and study designs. Motivational and social-affective outcomes-including mastery orientation, relatedness, responsibility, empathy, peer relationships, and prosocial behavior-were reported more consistently than improvements in physical performance, physical-activity intensity, or fitness. Motor and physical outcomes appeared more favorable when cooperative interaction remained connected to repeated individual practice, specific feedback, sufficient movement opportunities, and sustained implementation. Given the methodological limitations identified across the evidence base, these patterns should be interpreted as conditional rather than universally causal.

Across the five review questions, positive interdependence and individual accountability emerged as central structural conditions, while role distribution, adaptive task design, communication training, group processing, and teacher scaffolding influenced how learners participated and contributed. Outcomes also varied according to educational stage, activity type, intervention duration, group composition, prior competence, sex and gender, teacher preparation, and implementation fidelity. Importantly, social-affective benefits could occur without superior physical performance, and formal participation in group activity did not necessarily ensure equitable contribution or inclusion. Cooperative learning should therefore not be treated as synonymous with group work or assumed to be inclusive by default.

The review contributes an Inclusive Cooperative Activity-Based Learning Framework that integrates cooperative structures, pedagogical supports, movement opportunities, competence, relatedness, responsibility, psychological safety, meaningful contribution, and belonging. The framework is intended as an evidence-informed guide for interpreting how cooperative learning may support both competence development and inclusion under appropriate implementation conditions. For practice, teachers should protect active learning time, assess individual as well as group learning, rotate meaningful roles, provide accessible task options, and explicitly teach peer feedback, communication, and conflict-management skills.



Future research should strengthen causal inference through clearly reported randomization where feasible, more rigorous comparison designs, preregistration, implementation-fidelity assessment, objective physical-activity measures, validated motor and inclusion measures, interaction analysis, equity-sensitive outcomes, and longitudinal follow-up. Research should also distinguish physical presence from active participation, meaningful contribution, learning equity, and belonging. Activity-based cooperation is most educationally meaningful when learners are given genuine opportunities to move, contribute, develop competence, influence collective activity, and experience recognition within the group.

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Author Affiliations

Muhammad Wahyu, Putu Budi Adnyana, I Wayan Suastra, and Desak Made Citrawathi are affiliated with Ganesha University of Education, Indonesia.

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Authors and translators' details:

Muhammad Wahyu Setiyadi
Putu Budi Adnyana
I Wayan Suastra
Desak Made Citrawathi
Suryani

wahyusetiyadi074@gmail.com
budi@undiksha.ac.id
iwsuastra@undiksha.ac.id
dskcitra@undiksha.ac.id
suryanibima33@gmail.com

Author
Author
Author
Author
Translator

