



Application of The Cooperative Learning Model Student Teams Achievement Division Type in Developing Social Skills in Physical Education Learning

Reza Syaef Nuralie^{1*}, Tite Juliantine², Burhan Hambali³

¹²³Physical Education, Health and Recreation Study Program, Universitas Pendidikan Indonesia,
Bandung, Indonesia

Keywords

Cooperative
Learning; STAD;
Social Skills;
Physical Education;
Junior High School
Students.

Abstract

Physical Education (PE) learning in junior high school tends to be teacher-centered and focused on technical mastery, thus insufficiently facilitating the development of students' social skills. This study aims to examine the application of the Cooperative Learning model STAD type in developing social skills of Grade VII junior high school students in PE learning. The method used was quasi-experimental with a Non-Equivalent Control Group design, involving 34 students in the experimental group and 36 students in the control group selected through purposive sampling. Social skills were measured using the SSIS-RS (7 domains, 37 items), validated against 76 respondents and yielding a Cronbach's Alpha reliability coefficient of 0.913. The result of the Independent Samples T-Test on posttest data showed a significant difference between the two groups ($p = 0.003$), and the Mann-Whitney U test on N-Gain Scores confirmed the superiority of the experimental group ($p = 0.001$). It is concluded that the STAD-type cooperative learning model is significantly more effective in developing students' social skills compared to conventional learning, through a structured positive interdependence mechanism.

✉ Corresponding author :
E-mail: rezaalie1906@upi.edu

INTRODUCTION

The development of social skills is one of the fundamental challenges in 21st-century education. An individual's ability to communicate, cooperate, manage themselves, and empathize does not form automatically; rather it requires a learning environment consciously designed to facilitate it (Gresham et al., 2011). In the school context, Physical Education, Sport, and Health (PE) inherently has unique potential to serve as a vehicle for developing those social skills. Physical activity is inherently collaborative, demanding coordination, communication and mutual dependence among participants (Yang et al., 2021; Yoda, 2017). The PE Subject Guide (Badan Standar, 2025) also officially establishes the element of learning through movement as a core learning outcome targeting cooperation, decision-making, collaboration, and leadership. Thus, PE is not merely a physical arena it is a structured space for shaping social character.

However, this potential has not been optimally realized in practice. PE learning in many schools is still dominated by conventional, teacher-centered approach, with the main focus on mastering movement techniques and physical achievement alone (Yulianti et al., 2024). The teacher plays a dominant role as instructor, while students occupy a passive position as recipients. This patterns creates an individually competitive learning climate that is impoverished in meaningful social interaction (Mulyana et al., 2024). This situation becomes more critical when confronted with the characteristics of grade VII junior high school students who are in the early adolescent phase a psychosocial period marked by an intensification of identity seeking and an urgent need for social competence through peer interaction (Steinberg & Morris, 2000).

Theoretically, the solution to this problem has long been situated within Vygotsky's social constructivism framework, which asserts that the most effective learning occurs through social interaction and collaboration among students within the zone of proximal development. From this framework, the cooperative learning developed as a structured pedagogical response. Slavin (2014) formulated that cooperative learning places students in small groups with positive interdependence, where individual responsibility becomes the foundation for collective success. This principle directly aligns with the deep learning framework now mandated by Ministerial Regulation NO. 13 of 2025.

Among the various types of Cooperative Learning, Student Teams Achievement Division (STAD), developed by Slavin (2014), stands out as the most operational and structured variant. STAD consists of five stages class presentation, team study, individual quiz, calculation of improvement scores, and team recognition which systematically encourage interaction, interdependence, and individual accountability within the team. Its relevance to PE is strong: the small-team structure in STAD mirrors the group dynamics common in physical activity, while also providing a social scaffold that supports the growth of communication skills, responsibility, and mutual respect.

This relevance is supported by a growing body of research applying STAD within PE settings. Aidid et al. (2025) found that STAD improved students' sense of responsibility alongside football skill outcomes; Destriana & Hartati (2025) reported gains in shooting and dribbling skills following STAD implementation; and Yulianti et al. (2024) demonstrated its superiority over conventional instruction for volleyball passing technique. At a broader level, Yang et al. (2021) showed that cooperative learning enhances both motor skill acquisition and learning motivation, while Kurnia Wati (2025) extended this line of inquiry by reporting improvements in communication, cooperation, and social responsibility among primary school students. Collectively, these studies confirm that STAD is an effective pedagogical tool in PE but, as the following section outlines, they leave specific gaps regarding how social skills are measured, the rigor of the research design, and the age group studied.

However, when examined critically, this body of research leaves three significant gaps. First, nearly all studies treat the social-affective dimension only as an indirect outcome, not as the primary dependent variable measured by a standardized instrument (Boke et al., 2025). Second, the research designs employed are generally short-term classroom action studies without a control group, limiting the strength of causal inference. Third, no study has specifically examined the effect of STAD on the social skills of Grade VII junior high school

students using a standardized instrument such as the Social Skills Improvement System (SSIS) within a quasi-experimental design.

Therefore, this study aims to empirically examine the difference in social skill development between Grade VII junior high school students who received the STAD-type Cooperative Learning model and those who followed conventional learning in the PE context, through a quasi-experimental pretest-posttest control group design. The findings of this study are expected to fill the gap in the literature on the social-affective domain of PE while also providing empirical evidence that can serve as a practical basis for teachers in designing collaborative and meaningful learning in accordance with the curriculum mandate.

METHODS

Validity and Reliability of the Instrument

The instrument used in this study was adapted from the Social Skills Improvement System Rating Scales (SSIS-RS), previously employed by Mulyana et al. (2024) with a reported Cronbach's Alpha of 0.874. To confirm the instrument's validity and reliability within the present research context, an independent re-testing was conducted on 76 respondents drawn from outside the main research sample (i.e., separate from the 70 students involved in the experimental and control groups). This evaluation covered convergent validity and internal consistency reliability testing of all 37 questionnaire items, following established best practices for scale validation (Boateng et al., 2018).

Validity Test

Validity testing was conducted using the Pearson Product-Moment correlation method, comparing the obtained correlation coefficient (*r*-obtained) against the critical value from the *r*-distribution table. With a significance level of 5% ($\alpha = 0.05$) and a sample of $N = 76$, the degrees of freedom ($df = 74$), yielding a critical *r*-table value of 0.2257. An item was declared valid if *r*-obtained $>$ *r*-table with a significance value < 0.05 . Results showed that all 37 items met this criterion, with *r*-obtained ranging from 0.260 to 0.547 (see **Table 1**).

Table 1. Validity Test Results ($N = 76$)

Item	<i>r</i> -obtained	<i>r</i> -table	Sig. (2-tailed)	Note
Item 1	0.519	0.2257	0.000	Valid
Item 2	0.547	0.2257	0.000	Valid
Item 3	0.490	0.2257	0.000	Valid
...				
Item 37	0.260	0.2257	0.023	Valid

Reliability Test

Following validity confirmation, reliability testing was conducted to assess the instrument's internal consistency in the present sample. Cronbach's Alpha was used as the reliability coefficient, with an acceptance threshold of 0.70 (Taber, 2018). The re-testing yielded a Cronbach's Alpha of 0.913 higher than the 0.874 reported by Mulyana et al. (2024) indicating that the instrument remained highly reliable within this study's population (see **Table 2**). The instrument was therefore deemed suitable for use in the main data collection phase.

Table 2. Reliability Test Results

Cronbach's Alpha	N of Items	Note
0.913	37	Highly Reliable

Research Design and Approach

This study used a quantitative approach with a quasi-experimental research type. The specific design used was the Non-Equivalent Control Group Design, which involves experimental and control groups that were not randomly selected. The experimental group received treatment in the form of the STAD-type Cooperative Learning model, while the control group followed PE learning with conventional methods. Both groups underwent a pretest

before treatment and a posttest after treatment to identify changes in students' social skills (Creswell & Guettermen, 2019; Shadish et al., 2002).

Table 3. Non-Equivalent Control Group Research Design

Group	Pretest	Treatment	Posttest
Experimental (n = 34)	O ₁ SSIS-RS	X STAD Model (6 sessions)	O ₂ SSIS-RS
Control (n = 36)	O ₃ SSIS-RS	Conventional learning	O ₄ SSIS-RS

Notes: O₁, O₃ = Pretest of social skills (SSIS-RS, 7 domains, 37 items, $\alpha = 0.913$); O₂, O₄ = Posttest of social skills; X = STAD-type Cooperative Learning model treatment; = Conventional learning.

Population and Sample

The research population consisted of all Grade VII students at SMP Negeri 29 Bandung for the 2025/2026 academic year (9 classes, 287 students). The selection of this population was based on the consideration that Grade VII students are in the early adolescent phase, during which social skill development occurs most intensively through peer interaction (Steinberg & Morris, 2000).

From the 9 available classes, 2 classes were selected as the sample using purposive sampling based on: (1) equivalence of initial academic characteristics confirmed through a pretest equivalence test (Sig. = 0.239; $p > 0.05$); (2) the same subject teacher; and (3) equivalent schedules and learning conditions. One class (34 students) was designated as the experimental group with STAD-type Cooperative Learning treatment, and the other class (36 students) as the control group with conventional learning.

Research Instrument

The instrument used was an adaptation of the Social Skills Improvement System Rating Scales (SSIS-RS) developed by Gresham et al. (2011). This instrument covers seven main domains: communication, cooperation, assertion, responsibility, empathy, engagement, and self-control, elaborated into 37 statement items with a four-level scale (0 = Never; 1 = Rarely; 2 = Often; 3 = Almost Always). Total scores range from 0 to 111. As described above, instrument quality testing was conducted on 76 respondents prior to the main study, confirming that all 37 items were valid (r -obtained $>$ r -table; Sig. $<$ 0.05) with a Cronbach's Alpha of 0.913, classified as highly reliable (Taber, 2018). Before use, the instrument was reviewed by the supervising lecturer to assess content relevance to the PE context at the junior high school level, and by a graduate in Indonesian language and literature to assess linguistic clarity and phrasing accuracy.

Research Procedure

The study was conducted over a total of 8 sessions: 1 pretest session, 6 treatment sessions (approximately 80 minutes per session), and 1 posttest session. The number of 6 sessions was based on a systematic review of Cooperative Learning interventions in physical education, which indicated that 6 sessions represent the minimum threshold empirically shown to produce changes in psychosocial variables (Boke et al., 2025). In the experimental group, each session followed the five stages of STAD: (1) Class Presentation; (2) Team Study; (3) Individual Quiz; (4) Calculation of Improvement Scores; and (5) Team Recognition.

Data Analysis Technique

Data analysis was conducted using IBM SPSS Statistics version 21 and Microsoft Excel. The analysis stages included: (1) descriptive statistics; (2) Shapiro-Wilk normality test; (3) Levene's Test for homogeneity; (4) hypothesis testing using the Independent Samples T-Test or Mann-Whitney U (if normality assumptions were not met); and (5) calculation of N-Gain Scores using Hake's (1999) formula: $N\text{-Gain} = (X_{\text{post}} - X_{\text{pre}}) / (X_{\text{max}} - X_{\text{pre}})$, with criteria: high (> 0.70), moderate (0.30–0.70), low (< 0.30).

RESULTS AND DISCUSSION

Before inferential testing, a general overview of the distribution of social skill scores is presented in **Table 4**.

Table 4. Descriptive Statistics of Social Skills Scores

Group	Measurement	Mean	SD	Median	Min	Max
Experimental	Pretest	80.24	14.011	80.50	49	102
	Posttest	88.06	13.271	84.50	63	111
Control	Pretest	76.47	12.498	77.00	39	99
	Posttest	79.64	9.360	79.00	49	100

Source: Primary Data

The experimental group experienced an average increase in social skills scores of 7.82 points, from 80.24 (pretest) to 88.06 (posttest). The maximum posttest score of the experimental group reached the ideal score of 111, indicating that some students achieved optimal social skill development. The control group experienced only a 3.17-point increase (76.47 → 79.64), with a standard deviation decreasing from 12.498 to 9.360 indicating a more uniform distribution but no significant development.

Assumption Tests

The Shapiro-Wilk normality test was chosen because the sample size per group was fewer than 50 students (Mohd Razali & Bee Wah, 2011). Complete results are presented in **Table 5**.

Table 5. Normality Test Results (Shapiro-Wilk)

Variable	Group	Shapiro-Wilk Sig.	Note
Pretest	Experimental	0.202	Normal
	Control	0.280	Normal
Posttest	Experimental	0.202	Normal
	Control	0.079	Normal
N-Gain	Experimental	0.000	Not Normal
	Control	0.001	Not Normal

Source: SPSS version 21 output (2025)

The pretest and posttest data for both groups were normally distributed (Sig. > 0.05), so the Independent Samples T-Test was used for hypothesis testing. In contrast, the N-Gain Score data were not normally distributed (Sig. < 0.05), so they were analyzed using the Mann-Whitney U test.

Homogeneity Test and Mean Difference Test

Table 6. Homogeneity Test and Mean Difference Test (Independent Samples T-Test)

Variable	Levene Sig.	Note	Sig. (2-tailed)	Conclusion
Pretest	0.131	Homogeneous	0.239	Not significant
Posttest	0.004	Not Homogeneous	0.003	Significant

Source: SPSS version 21 output

The pretest data showed a Levene value of 0.131 (Sig. > 0.05; homogeneous) and a T-Test with $p = 0.239$ (not significant), confirming the equivalence of initial conditions between the two groups. Conversely, the posttest data showed non-homogeneous variances (Levene Sig. = 0.004) and a T-Test with $p = 0.003$ (significant), proving that the experimental group was significantly superior to the control group after treatment.

Mann-Whitney U Test (N-Gain Score)**Table 7.** Mann-Whitney U Test Results (N-Gain Score)

Statistic	Value
Mann-Whitney U	323.500
Wilcoxon W	989.500
Z	-3.391
Asymp. Sig. (2-tailed)	0.001

Source: SPSS version 21 output

The Mann-Whitney U test results showed an Asymp. Sig. (2-tailed) value of 0.001 ($p < 0.05$) and $Z = -3.391$. This means there is a significant difference in social skill improvement between the experimental and control groups, with the experimental group experiencing substantially greater improvement. Thus, the application of the STAD-type Cooperative Learning model is proven to have a significantly positive effect on the social skills of Grade VII junior high school students in PE learning.

The results of this study prove that the application of the STAD-type Cooperative Learning model has a significant effect on the social skills of Grade VII junior high school students in PE learning. This finding can be understood from two perspectives: theoretical and empirical. Theoretically, the effectiveness of STAD in developing social skills is rooted in the mechanism of positive interdependence the principle that the group's success depends on each individual's contribution (Slavin, 2014). When students realize that their group score is determined by the personal improvement of each member, intrinsic motivation emerges to help one another, communicate effectively, and be responsible toward the team. This mechanism directly trains the social skill components measured by the SSIS-RS (Gresham et al., 2011). The team study stage becomes a concrete arena for students to practice prosocial behavior. In the PE context, physical activities that demand team coordination deepen this social experience, as every movement in a team game demands real social synchronization (Casey & Fernandez-Rio, 2019).

Empirically, these findings are consistent with previous research. Kurnia Wati (2025) found that STAD in PE learning improved elementary school students' communication, cooperation, and social responsibility. Mulyana et al. (2024) concluded that cooperative models significantly influenced university students' social skills. Bjørke & Mordal Moen (2020) affirmed that Cooperative Learning in physical education strengthens social cohesion and mutual trust. The meta-analysis by Boke et al. (2025) confirmed that Cooperative Learning consistently improves affective learning outcomes, including the social dimension.

The greater improvement in the experimental group is also relevant to the developmental characteristics of Grade VII students. In the early adolescent phase, the need for social acceptance and group interaction is very high (Steinberg & Morris, 2000). The STAD model, which places students in heterogeneous groups, provides a safe space for students to build social identity and develop interpersonal confidence psychosocial needs that are not facilitated in conventional learning, which tends to be individual and competitive.

Several limitations must be acknowledged. First, the number of treatment sessions 6 was relatively brief. Second, the use of self-report questionnaires is susceptible to social desirability bias. Third, the sample covered only two classes in one school, so generalization should be done with caution. Fourth, this study did not trace the specific effect on individual social skill domains. Fifth, although the framework of Ministerial Regulation No. 13 of 2025 was used as a contextual foundation, the attainment of the deep learning dimension was not operationalized as a separate variable.

CONCLUSION

Based on the research results, three main conclusions can be drawn. First, there was no significant difference in initial social skill ability between the experimental and control groups (pretest Sig. = 0.239; $p > 0.05$), confirming group equivalence prior to treatment. Second, there was a significant difference in social skills between the two groups following the intervention (posttest Sig. = 0.003; $p < 0.05$), with the experimental group demonstrating higher social skill scores than the control group. Third, the N-Gain Score analysis confirmed that the improvement in the experimental group was significantly greater than in the control group (Asymp. Sig. = 0.001; $p < 0.05$), indicating that the STAD-type Cooperative Learning model is more effective in developing the social skills of Grade VII junior high school students in PE learning compared to conventional instruction.

These findings are consistent with Slavin's cooperative learning theory, which posits that structured group interdependence specifically positive interdependence and individual accountability creates conditions that naturally foster communication, cooperation, and social responsibility among learners. The team study phase in STAD, wherein students collaboratively discuss tasks and support one another toward shared achievement, directly operationalizes these mechanisms. This aligns with Gresham's view that social skills develop through repeated, structured social interaction experiences rather than passive instruction.

The results also corroborate empirical evidence from Casey & Fernandez-Rio, who demonstrated that cooperative learning in PE settings meaningfully strengthens affective outcomes including peer cooperation, empathy, and positive social relations. Furthermore, consistent with Kurnia Wati's findings on STAD implementation in PE contexts, and with Boke's meta-analytic conclusion that cooperative learning consistently produces positive effects on students' affective and social domains, the present study reinforces that STAD is not merely an instructional strategy for cognitive outcomes, but a structurally sound approach for developing the interpersonal competencies that physical education is uniquely positioned to cultivate.

Given the quasi-experimental design without full randomization, causal claims should be interpreted with caution. Future research should consider: (1) replication with multi-school samples and longer treatment duration; (2) domain-specific analysis using SSIS-RS subscales to identify which social skill dimensions are most responsive to STAD; and (3) a mixed-methods design integrating structured observation to verify whether observed score gains reflect genuine internalization of social competencies rather than surface-level behavioral compliance.

REFERENCES

- Aidid, W. A., Adawiyah, S. H., Azrai, E., & Aiman, M. A. (2025). The effect of STAD type cooperative learning model on attitude of responsibility and learning outcomes of football playing skills at secondary school. *Journal of Physical Education for Secondary Schools*, 5(1), 408–416. <https://doi.org/10.17509/jpess.v2i2.60950>
- Bjørke, L., & Mordal Moen, K. (2020). Cooperative learning in physical education: A study of students' learning journey over 24 lessons. *Physical Education and Sport Pedagogy*, 25(6), 600–612. <https://doi.org/10.1080/17408989.2020.1761955>
- Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quinonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, 6, Article 149. <https://doi.org/10.3389/fpubh.2018.00149>
- Boke, H., Aygun, Y., Tufekci, S., Yagin, F. H., Canpolat, B., Norman, G., Prieto-González, P., & Ardigò, L. P. (2025). Effects of cooperative learning on students' learning outcomes in physical education: A meta-analysis. *Frontiers in Psychology*, 16, Article 1508808. <https://doi.org/10.3389/fpsyg.2025.1508808>
- Casey, A., & Fernandez-Rio, J. (2019). Cooperative learning and the affective domain. *Journal of Physical Education, Recreation & Dance*, 90(3), 12–17. <https://doi.org/10.1080/07303084.2019.1559671>
- Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (6th ed.). Pearson.
- Destriana, A., & Hartati. (2025). Application of the STAD type cooperative learning model to improve shooting & dribbling skills in games. *Jurnal Pendidikan Jasmani dan Olahraga*, 10(1), 45–55.
- Gresham, F. M., Elliott, S. N., Vance, M. J., & Cook, C. R. (2011). Comparability of the Social Skills Rating System to the Social Skills Improvement System: Content and psychometric comparisons across

- elementary and secondary age levels. *School Psychology Quarterly*, 26(1), 27–44. <https://doi.org/10.1037/a0022662>
- Kurnia Wati, P. (2025). Enhancing primary school students' social skills through TGT and STAD cooperative learning in physical education. *Pathology: Journal of Educational Sciences*, 1(2), 78–89. <https://doi.org/10.64538/pathology.v1i2.147>
- Mohd Razali, N., & Bee Wah, Y. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), 21–33.
- Mulyana, F. R., Juniar, D. T., Malik, A. A., Mulyana, D., & Hanief, Y. N. (2024). The influence of cooperative learning models and learning styles on social skills in university student. *International Journal of Disabilities Sports and Health Sciences*, 7(1), 9–18. <https://doi.org/10.33438/iidshs.1368958>
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin.
- Slavin, R. E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology*, 21(1), 43–69. <https://doi.org/10.1006/ceps.1996.0004>
- Slavin, R. E. (2014). Aprendizaje cooperativo y rendimiento académico: ¿por qué funciona el trabajo grupal? *Anales de Psicología*, 30(3), 785–791. <https://doi.org/10.6018/analesps.30.3.201201>
- Steinberg, L., & Morris, A. S. (2000). Adolescent development. *Annual Review of Psychology*, 51(1), 83–110. <https://doi.org/10.1146/annurev.psych.51.1.83>
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Yang, C., Chen, R., Chen, X., & Lu, K. H. (2021). The efficiency of cooperative learning in physical education on the learning of action skills and learning motivation. *Frontiers in Psychology*, 12, Article 717528. <https://doi.org/10.3389/fpsyg.2021.717528>
- Yoda, I. K. (2017). The development of cooperative learning model based on local wisdom of Bali for physical education, sport and health subject in junior high school. *IOP Conference Series: Materials Science and Engineering*, 180(1), Article 012166. <https://doi.org/10.1088/1757-899X/180/1/012166>
- Yulianti, M., Wahyudi, A., Anggara Suganda, M., Suryadi, D., & Herdiyana Bastian, R. (2024). STAD-type cooperative learning model and conventional learning model: A comparative study on the learning outcomes of basic volleyball lower passing techniques. *Retos*, 56, 452–461. <https://doi.org/10.47197/retos.v56.104251>