



The Effectiveness of the Teams Games Tournament (TGT) Cooperative Learning Model Assisted by Modified Plastic Balls in Elementary Volleyball Learning

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ABSTRACT

This study investigated the effectiveness of the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls in improving elementary school students' volleyball underhand passing skills. The study employed a Classroom Action Research design involving 20 fifth-grade students at SDN Warloka Labuan Bajo, Indonesia, during the 2022 academic year. Data were collected through cognitive, affective, and psychomotor assessments, as well as classroom observations. The findings demonstrated significant improvements in students' learning outcomes across two action cycles. In Cycle I, only 50–70% of students achieved the minimum mastery criterion, while in Cycle II, the percentage increased to 85–90%. The implementation of the TGT model and modified learning media also enhanced students' participation, motivation, and collaborative engagement during volleyball learning activities. These findings suggest that cooperative learning supported by modified instructional media can serve as an effective pedagogical strategy for improving physical education learning outcomes at the elementary school level.

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INTRODUCTION

Physical Physical education plays an important role in supporting students' physical, cognitive, affective, and social development through movement-based learning experiences. Physical education is not only oriented toward improving physical fitness but also toward developing critical thinking, teamwork, emotional stability, and healthy lifestyles among students (Widodo, 2018). Through physical education learning, students are expected to develop self-management skills, discipline, cooperation, confidence, and sportsmanship in various sports activities (Erfan, 2017).

In recent years, educational systems worldwide have increasingly emphasized student-centered and active learning approaches to improve students' engagement and learning outcomes. This issue is particularly relevant in physical education because many students experience low participation and limited motivation during sports learning activities. Previous studies have reported that traditional teacher-centered instructional approaches often reduce students' enthusiasm and participation during physical education classes. Consequently, innovative learning models are needed to create more interactive, collaborative, and enjoyable learning environments.

One of the sports commonly taught in elementary school physical education is volleyball. Volleyball is considered a popular sport because it supports students' motor development, teamwork, coordination, and social interaction (Suhartono, 2020). The development of volleyball education has become increasingly important because volleyball is included in the physical education curriculum at elementary, junior high, and senior high school levels (Warnasih et al., 2023). Fundamental volleyball techniques such as passing, serving, blocking, and smashing are essential skills that students must master to participate effectively in gameplay activities (Heri et al., 2016).

Among these techniques, underhand passing is considered one of the most fundamental skills for beginner learners. Underhand passing requires coordination between body posture, arm movement, foot positioning, and balance to produce effective ball control (Sada, 2020). However, many elementary school students experience difficulties in mastering correct underhand passing techniques due to limited practice opportunities, low confidence, and ineffective instructional methods.

Observational findings at SDN Warloka Labuan Bajo revealed several problems during volleyball learning activities. Students showed low participation and limited interest in learning activities, while many students failed to achieve the Minimum Mastery Criterion (KKM). Only 54% of students achieved the required mastery level, while the remaining students demonstrated insufficient understanding and poor movement performance during underhand passing practice. Similar findings have been reported by Naziah et al. (2020), who stated that low learning engagement can negatively affect students' academic and motor performance.

Another challenge identified in this study was the limited availability of learning facilities and equipment. The school only possessed two volleyballs for classroom instruction, which restricted students' opportunities for active practice. Limited facilities often reduce students' participation during practical learning activities and hinder the development of movement skills. Therefore, the use of modified learning media such as plastic balls may provide a practical solution for improving students' participation and learning experiences.

To address these problems, teachers need to implement innovative and collaborative instructional approaches. One of the cooperative learning models frequently applied in physical education is the Teams Games Tournament (TGT) model. TGT emphasizes group collaboration, peer interaction, games, tournaments, and group rewards to improve students'

motivation and participation during learning activities (Rifqi, 2022). Through cooperative learning, students are encouraged to support one another, exchange ideas, and actively participate in group learning activities.

Previous studies have demonstrated that cooperative learning can improve students' motivation, teamwork, and academic achievement in physical education contexts (Triningsih, 2020). However, limited studies have specifically investigated the effectiveness of the TGT cooperative learning model assisted by modified plastic balls in improving elementary school students' volleyball underhand passing skills. Most previous studies focused only on cooperative learning strategies without integrating modified instructional media to address facility limitations in elementary school settings.

Therefore, this study aims to examine the effectiveness of the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls in improving fifth-grade students' volleyball underhand passing skills and learning participation at SDN Warloka Labuan Bajo. This study contributes to the literature by providing practical evidence regarding the integration of cooperative learning and modified instructional media in elementary physical education learning.

METHODS

Research Design

This study employed a Classroom Action Research (CAR) design to improve students' volleyball underhand passing skills through the implementation of the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls. Classroom Action Research was selected because it allows teachers and researchers to identify classroom learning problems systematically and implement reflective instructional improvements to enhance students' learning outcomes and participation during physical education activities (Anda-Juanda, 2016).

The study was conducted in two action cycles, and each cycle consisted of four stages: planning, action, observation, and reflection. The implementation of Cycle II was based on the evaluation and reflection results obtained from Cycle I. The CAR approach was considered appropriate because the study aimed not only to evaluate learning outcomes but also to improve instructional practices and classroom interaction during volleyball learning activities.

Participants and Research Setting

The study was conducted at SDN Warloka Labuan Bajo, Indonesia, during the 2022 academic year. The participants consisted of 20 fifth-grade students enrolled in physical education classes. A total sampling technique was employed because all students in the classroom were directly involved in the learning intervention and assessment process.

Ethical Considerations

Prior to conducting the study, permission was obtained from the school principal and physical education teacher at SDN Warloka Labuan Bajo. All learning activities were conducted in accordance with educational research ethics. Students participated voluntarily in the instructional activities, and the confidentiality of participants' identities and assessment data was maintained throughout the study. The research procedures did not involve any harmful physical or psychological treatment and were integrated into regular physical education learning activities.

Instruments and Learning Materials

Several instruments and learning materials were used to collect quantitative and qualitative data during the study:

1. Lesson Plans (RPP)

Lesson plans were designed based on the TGT cooperative learning model and adjusted to the elementary school physical education curriculum.

2. Psychomotor Assessment Rubric

A performance assessment rubric was developed to evaluate students' volleyball underhand passing skills. The rubric consisted of several assessment indicators, including:

- a) body posture,
- b) arm position,
- c) ball control,
- d) movement coordination,
- e) and passing accuracy.

Each indicator was scored using a four-point scale:

- a) 1 = poor,
- b) 2 = fair,
- c) 3 = good,
- d) 4 = excellent.

2. Cognitive Test

A written test consisting of multiple-choice questions was used to assess students' understanding of volleyball concepts and underhand passing techniques.

3. Affective Observation Sheet

Observation sheets were used to assess students' discipline, teamwork, participation, cooperation, and sportsmanship during learning activities.

4. Field Notes

Field notes were used to document classroom situations, student responses, learning obstacles, and instructional improvements implemented during each cycle.

5. Modified Plastic Balls

Modified plastic balls were used as instructional media to facilitate safer and more accessible volleyball learning activities for elementary school students.

Instrument Validation and Reliability

To ensure content validity, all research instruments were evaluated by two experts in physical education and sports pedagogy through expert judgment procedures. The experts reviewed the clarity, relevance, and suitability of the assessment indicators with the learning objectives and students' developmental characteristics. Revisions were conducted based on the experts' suggestions before the instruments were implemented in the classroom.

Reliability checking was conducted through inter-rater reliability procedures during psychomotor and affective assessments. Three collaborator observers independently assessed students' performances using the same scoring rubric and assessment criteria. The involvement of multiple observers was intended to reduce subjective bias and improve scoring consistency throughout the research process.

Research Procedures

Cycle I

During the planning stage, the researcher prepared lesson plans, assessment instruments, observation sheets, modified plastic balls, and learning materials based on the TGT cooperative learning model.

At the implementation stage, students participated in volleyball learning activities focused on underhand passing techniques through cooperative group-based learning. Students were divided into heterogeneous groups consisting of different skill levels. Learning activities included demonstrations, group discussions, games, tournaments, and practical passing exercises.

Observations were conducted collaboratively by the researcher and observers to evaluate students' participation, teamwork, and psychomotor performance. Reflection activities identified several weaknesses in Cycle I, including limited student confidence, ineffective group interaction, and insufficient movement coordination.

Cycle II

Based on the reflection results from Cycle I, several instructional improvements were implemented in Cycle II, including:

- clearer demonstrations of passing techniques,
- more structured group activities,
- increased practice opportunities,
- and improved classroom management.

Students demonstrated greater participation, cooperation, and confidence during volleyball learning activities in Cycle II. The revised instructional procedures also improved students' passing accuracy and movement coordination.

Data Analysis

The collected data were analyzed using descriptive statistical techniques. Quantitative data were presented in the form of:

- mean scores,
- percentages,
- learning mastery levels,
- highest and lowest scores,
- and improvement percentages between cycles.

Learning mastery was determined based on the Minimum Mastery Criterion (KKM) established by the school. Students were categorized as achieving mastery if they reached the predetermined minimum score.

The percentage of learning mastery was calculated using the following formula:

$$P = \frac{n}{f} 100\%$$

Where:

- P = percentage of learning mastery,
- F = number of students achieving mastery,
- N = total number of students.

Qualitative data obtained from classroom observations and field notes were analyzed descriptively to support the interpretation of students' motivation, participation, cooperation, and learning engagement during the implementation of the TGT cooperative learning model assisted by modified plastic balls.

RESULTS

The implementation of the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls demonstrated significant improvements in students' volleyball underhand passing skills and participation during physical education learning activities. Improvements were observed in cognitive understanding, psychomotor performance, and affective engagement across two action cycles.

Initial Learning Conditions

Preliminary observations indicated that students experienced difficulties in performing proper underhand passing techniques. Several students showed low participation, weak movement coordination, and limited confidence during volleyball learning activities. In addition, the limited number of volleyballs reduced students' opportunities for active practice.

Table 1 presents the students' initial learning outcomes before the implementation of the TGT cooperative learning model.

Table 1. Initial Learning Outcomes

Indicator	Result
Total Students	20
Students Achieving Mastery	11
Students Not Achieving Mastery	9
Learning Mastery Percentage	54%
Mean Score	68.2
Standard Deviation	7.25

The findings indicate that students' initial learning outcomes were still below the Minimum Mastery Criterion established by the school.

Cycle I Results

After the implementation of the TGT cooperative learning model assisted by modified plastic balls in Cycle I, students demonstrated improvements in participation and movement performance during volleyball learning activities.

Table 2. Students' Learning Outcomes in Cycle I

Collaborator	Students Achieving Mastery	Percentage	Mean Score
Collaborator 1	12	60%	77.0
Collaborator 2	10	50%	72.4
Collaborator 3	14	70%	76.2

Table 3. Descriptive Statistics of Cycle I

Statistical Indicator	Result
Mean Score	75.2
Highest Score	85
Lowest Score	65
Standard Deviation	6.84

The results in Cycle I showed that students became more active and engaged during volleyball learning activities. However, several students still experienced difficulties in coordinating body movements, maintaining correct arm positions, and controlling passing accuracy during practice sessions.

Classroom observations also revealed that some students remained hesitant to participate actively in tournament activities and group discussions. In addition, group cooperation had not yet developed optimally because several students still depended on higher-skilled peers during practice activities.

Cycle II Results

Several instructional improvements were implemented in Cycle II based on the reflection results from Cycle I, including clearer demonstrations, more structured group activities, increased teacher feedback, and additional passing practice sessions. The implementation of these improvements resulted in substantial enhancement of students' volleyball underhand passing skills and learning participation.

Table 4. Students' Learning Outcomes in Cycle II

Collaborator	Students Achieving Mastery Percentage	Mean Score
Collaborator 1	18	90%
Collaborator 2	17	85%
Collaborator 3	18	90%

Table 5. Descriptive Statistics of Cycle II

Statistical Indicator	Result
Mean Score	83.3
Highest Score	95
Lowest Score	75
Standard Deviation	5.12

The increase in mean scores and the decrease in standard deviation indicate that students' learning performance became more consistent in Cycle II. Most students demonstrated better body coordination, passing accuracy, movement control, and confidence during volleyball learning activities.

Comparison of Learning Outcomes Between Cycles

Table 6 presents the comparison of students' learning outcomes from the initial condition to Cycle II.

Table 6. Comparison of Learning Outcomes Across Cycles

Stage	Mastery Percentage	Mean Score	Standard Deviation
Initial Condition	54%	68.2	7.25
Cycle I	60–70%	75.2	6.84
Cycle II	85–90%	83.3	5.12

The findings indicate continuous improvement in students' volleyball learning outcomes after the implementation of the TGT cooperative learning model assisted by modified plastic balls.

Qualitative Observation Findings

Qualitative classroom observations revealed several important thematic findings during the implementation of the learning model.

1. Increased Student Participation

Students became more active and enthusiastic during volleyball practice activities, particularly during tournament sessions and group competitions.

2. Improved Teamwork and Peer Interaction

Students demonstrated better cooperation and communication within groups. Higher-skilled students actively assisted peers who experienced difficulties in performing passing techniques.

3. Enhanced Learning Motivation and Confidence

The use of modified plastic balls reduced students' fear of making mistakes and increased their confidence during volleyball practice activities. Students appeared more willing to participate and perform movement demonstrations in front of peers.

4. Better Classroom Engagement

The TGT cooperative learning model created a more interactive and student-centered classroom atmosphere. Students became more responsive to teacher instructions, feedback, and peer discussions during learning activities.

Overall, the implementation of the TGT cooperative learning model assisted by modified plastic balls successfully improved students' volleyball underhand passing skills, collaborative engagement, and participation in physical education learning activities.

DISCUSSION

The findings of this study demonstrate that the implementation of the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls effectively improved elementary school students' volleyball underhand passing skills and learning participation. Significant improvements were observed in students' cognitive understanding, psychomotor performance, teamwork, and classroom engagement throughout the two action cycles.

The improvement in students' learning mastery and mean scores indicates that cooperative learning strategies can positively influence physical education learning outcomes. These findings are consistent with previous studies reporting that cooperative learning models improve students' motivation, participation, and sports skill acquisition during physical education instruction. Triningsih (2020) found that cooperative learning activities increased students' volleyball learning achievement and classroom participation. Similarly, Rifqi (2022) emphasized that the TGT model encourages active student involvement through group interaction, games, and tournament-based learning activities.

The effectiveness of the TGT cooperative learning model in this study can be explained through the perspective of social constructivist learning theory. According to social constructivism, learning occurs through interaction, collaboration, and shared experiences among learners. During the implementation of the TGT model, students worked collaboratively in heterogeneous groups consisting of different skill levels. Higher-skilled students assisted peers who experienced difficulties in performing underhand passing techniques, creating opportunities for peer-assisted learning and collaborative problem-solving during volleyball practice sessions.

Peer-assisted learning played an important role in improving students' confidence and technical performance. Students who initially lacked confidence gradually became more willing to participate because they received direct support, feedback, and encouragement from group members. This finding supports the view that cooperative interaction can reduce students' anxiety and increase learning motivation during sports instruction. Through repeated social interaction, students developed not only technical volleyball skills but also communication abilities, teamwork, and social responsibility.

From the perspective of motor learning theory, repeated movement practice and immediate feedback are essential components in the development of psychomotor skills. The TGT cooperative learning model provided students with multiple opportunities to practice underhand passing techniques through games, tournaments, demonstrations, and group exercises. Continuous practice activities improved students' movement coordination, body posture, arm positioning, and ball control during volleyball learning activities. The decrease in standard deviation values between cycles also indicates that students' performances became more consistent after repeated practice and collaborative learning experiences.

The use of modified plastic balls also contributed positively to students' motor skill development and classroom participation. Compared to standard volleyballs, modified plastic balls were lighter, safer, and easier for elementary school students to control during practice activities. As a result, students became more confident in performing passing movements and showed greater willingness to participate actively during learning sessions. This finding supports previous studies suggesting that modified instructional media can improve students' engagement and reduce fear during sports learning activities.

Another important finding of this study relates to collaborative cognition during learning activities. Through group discussions and tournament sessions, students were encouraged to exchange ideas, observe peer performance, and collectively solve movement-related problems. This collaborative learning environment promoted active cognitive engagement and improved students' understanding of volleyball techniques. The classroom atmosphere became more interactive and student-centered compared to conventional teacher-dominated instruction.

Despite the positive findings, several challenges were identified during Cycle I. Some students initially experienced difficulties adapting to cooperative learning procedures and effective group communication. In addition, several lower-skilled students tended to rely heavily on dominant peers during group activities. However, these limitations gradually decreased after clearer instructions, improved classroom management, and additional demonstrations were implemented in Cycle II.

Overall, this study confirms that the TGT cooperative learning model assisted by modified plastic balls can serve as an effective pedagogical strategy for improving elementary school students' volleyball learning outcomes. The integration of cooperative learning, peer-assisted interaction, modified instructional media, and repeated motor practice successfully

created a more engaging, inclusive, and student-centered physical education learning environment.

CONCLUSION

This study demonstrated that the Teams Games Tournament (TGT) cooperative learning model assisted by modified plastic balls effectively improved elementary school students' volleyball underhand passing skills and learning participation. The implementation of collaborative and student-centered learning activities contributed positively to students' cognitive understanding, psychomotor performance, teamwork, confidence, and classroom engagement during physical education learning activities.

The findings revealed substantial improvements in students' learning outcomes across two action cycles, indicating that the integration of cooperative learning strategies and modified instructional media can create more effective and meaningful learning experiences in elementary school physical education. The use of modified plastic balls also supported students' motor skill development by providing safer and more accessible learning equipment that increased students' willingness to participate actively during volleyball practice sessions.

From a pedagogical perspective, this study highlights the importance of combining cooperative learning approaches with adaptive instructional media to improve students' participation and skill acquisition in sports learning contexts. The findings contribute to the growing literature on cooperative learning in physical education, particularly regarding the effectiveness of the TGT model in promoting peer-assisted learning, collaborative interaction, and active motor practice among elementary school students.

Therefore, the TGT cooperative learning model assisted by modified plastic balls can be recommended as an effective instructional strategy for physical education teachers seeking to improve volleyball learning outcomes and create more interactive, inclusive, and student-centered classroom environments. Future studies are recommended to investigate the implementation of cooperative learning models in different sports contexts, educational levels, and learning environments to further strengthen the development of innovative physical education pedagogy.

IMPLICATION

Based

AUTHORS' NOTE (Jangan di hapus)

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

REFERENCES

- Ahmadi, N. (2007). Panduan olahraga bola voli. *Surakarta: Era Pustaka Utama*, 12.
- Anda Juanda, A. J. (2016). Penelitian tindakan kelas: Classroom action research.
- Brilin, A. S. (2015). Meningkatkan Keterampilan Servis Bawah Pada Pembelajaran Bola Voli Melalui Media Visual Siswa Kelas V SDN Pebatae.
- Erfan, M. (2017, November). Peran guru penjas terhadap kebugaran (kesegaran) jasmani siswa. In *Seminar Nasional Pendidikan Olahraga* (Vol. 1, No. 1, pp. 184-192).
- Hendra, J., & Putra, G. I. (2019). Mengembangkan Keterampilan Gerak Dasar Manipulatif Bagi Anak Melalui Permainan Olahraga Di Taman Kanak-Kanak. *Jurnal Muara Pendidikan*, 4(2), 438-444.

- Herawati, A., Abduloh, A., & Resita, C. (2021). Motivasi Belajar Siswa dalam Meningkatkan Pembelajaran Bola Voli Passing Bawah di Kelas VIII SMPN 1 Pondoksalam Purwakarta. *Jurnal Literasi Olahraga*, 2(1), 1-9.
- Heri, J., Supriatna, E., & Purnomo, E. (2016). Survey Keterampilan Tehnik Dasar Bola Voli Pada Siswa Putra yang Mengikuti Ekstrakurikuler Di SMA Negeri 4 Pontianak. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa (JPPK)*, 5(2).
- Juliantine, T. (2010). Strategi mengajar melalui model bermain dalam mata pelajaran pendidikan jasmani di sekolah dasar. *Motion: Jurnal Riset Physical Education*, 1(1), 1-9.
- Laâ, R. A., & Haluti, A. (2018). Pelatihan Teknik Dasar Permainan Bola Voli. *MONSU'ANI TANO Jurnal Pengabdian Masyarakat*, 1(1).
- Masroni, A. H., & Hariyanto, E. (2021). Survei Keterampilan Teknik Dasar Bolavoli Ekstrakurikuler Bolavoli Sekolah Menengah Atas. *Sport Science and Health*, 3(5), 284-293.
- Naziah, S. T., Maula, L. H., & Sutisnawati, A. (2020). Analisis keaktifan belajar siswa selama pembelajaran daring pada masa covid-19 di sekolah dasar. *Jurnal Pendidikan Sekolah Dasar Ahmad Dahlan*, 7(2), 109-120.
- Nugraha, B. (2015). Pendidikan jasmani olahraga usia dini. *Jurnal Pendidikan Anak*, 4(1).
- Rifqi, M. R. M. (2022). Pengaruh Penerapan Strategi Pembelajaran Cooperative Learning Model Team Game Tournament (TGT) untuk Meningkatkan Keaktifan Peserta Didik. *Edudikara: Jurnal Pendidikan Dan Pembelajaran*, 7(1).
- Sada, B. (2020). Upaya Mengatasi Kesulitan Pada Passing Bawah Melalui Variasi Latihan di Kelas V SDI Ngedumee Kecamatan Golewa Barat Kabupaten Ngada Tahun Pelajaran 2019/2020. *E-Journal | Warta Pendidikan*, (43), 52-57.
- Suharno, H. P. (1981). Metodik Melatih Permainan Bola Volley. *Yogyakarta: IKIP Yogyakarta*.
- Suhartono, F. A. (2020) Permainan Bola Voli-Fannisa X MIA 3.
- Suryobroto, A. S. (2004). Diktat Mata Kuliah Sarana dan Prasarana Pendidikan Jasmani. *Yogyakarta: FIK-UNY*.
- Susanto, A. (2010). Upaya Meningkatkan Pembelajaran Bolavoli Melalui Pendekatan Bermain dengan Bola Plastik pada siswa kelas IV SD Negeri 2 Rogojati Kecamatan Sokoharjo Kabupaten Wonosobo. *Skripsi. FIK-UNY*.
- Syatria, D. (2019). Peningkatan keterampilan passing bawah Bola voli melalui metode pembelajaran kooperatif. *Tarbawi: Jurnal Ilmu Pendidikan*, 15(2), 141-152.
- Triningsih, S. (2020). Penerapan teknik latihan terpusat dengan metode bermain untuk meningkatkan aktivitas kegiatan Passing Atas dan Bawah Bola Voli. *Jurnal Ilmiah WUNY*, 2(2), 78-86.
- Utomo, A. W. (2020, June). Sosialisasi Sekolah Pelajar Bola Voli Motivasi Berlatih Sejak Dini Untuk Kedepan Meraih Prestasi. In *Seminar Nasional Olahraga* (Vol. 2, No. 1).
- Viera, B. L., & Ferguson, B. J. (2004). Bola voli tingkat pemula. *Jakarta: PT. Raja Grafindo Persada*.
- Warnasih, S., Samsudin, S., & Juniarto, M. (2023). Kurikulum Sekolah Bola Voli Sekolah Menengah Atas di Tangerang Selatan. *Advances In Social Humanities Research*, 1(9), 1132-1140.

- Widodo, A. (2018). Makna dan Peran pendidikan jasmani dalam pembentukan insan yang melek jasmaniah/ter-literasi jasmaniahnya. *Motion: Jurnal Riset Physical Education*, 9(1), 53-60.
- Yono, T., & Sodikin, F. A. (2020). Modifikasi Bola Plastik sebagai Media Pembelajaran Bola Voli. *Sparta*, 2(2), 26-31.