

Improving Overhead Pass Skills in Volleyball through the PAIKEM Approach among Fifth-Grade Students of Tubunaus State Elementary School

Ardi Y. Tafuy*, Apris I. Tuan

Sports Coaching Education Study Program, Institute of Education Soe, Soe 85511, Indonesia

*Corresponding author: arditafuy@gmail.com

Received:
27/06/2026

Revised:
23/07/2026

Accepted:
27/07/2026

Abstract: This classroom action research investigated improvement in volleyball overhead-passing skills through the PAIKEM (Active, Innovative, Creative, Effective, and Enjoyable Learning) approach among 32 fifth-grade students at Tubunaus State Elementary School. The study began with a baseline pretest and continued through two action cycles, with two meetings in each cycle. Data were collected using an overhead-passing practical test, teacher and student observation sheets, and descriptive knowledge questions. Quantitative data were summarized using mean scores, the percentage of students meeting the Minimum Mastery Criterion (KKM = 75), and class-average normalized gain; observational findings were used to guide reflection and revision between cycles. The mean score increased from 33.12 at pretest to 71.25 in Cycle I and 96.87 in Cycle II. Mastery increased from 2 of 32 students (6.25%) to 15 students (46.87%) and then to all 32 students (100%). The normalized gain was 0.57 from pretest to Cycle I (medium) and 0.95 from pretest to Cycle II (high). Cycle I observations identified persistent errors in hand and foot positioning, while Cycle II emphasized targeted correction, repeated practice, and active participation. These findings indicate that the PAIKEM-based classroom actions supported substantial improvement in students' overhead-passing performance.

Keywords: *PAIKEM approach; overhead pass; volleyball, elementary students*

INTRODUCTION

Physical Education, Sports, and Health (PJOK) is an important school setting for developing children's motor competence, physical fitness, and broader learning outcomes. Motor competence during the elementary-school years provides a foundation for later sport-specific skills and participation in physical activity. Large-scale and review evidence also indicates that well-designed physical education can support

psychomotor, affective, social, and cognitive development, particularly when learning activities are intentionally structured rather than limited to participation alone (Drenowatz et al., 2021; Dudley et al., 2022). Volleyball is commonly used in PJOK to develop object-control skills, coordination, cooperation, and game understanding. One fundamental skill is the overhead pass, which requires coordinated foot and body positioning, appropriate hand shape, controlled contact with the ball, and extension toward the target. Research on volleyball instruction has shown that the choice of learning strategy influences overhead-passing outcomes, and student-centered or game-oriented models have been developed specifically to support overhead passing in school settings (Akhmad et al., 2022; Aryanti et al., 2022).

The results of initial observations conducted by researchers on 32 fifth grade students of Tubunaus State Elementary School (consisting of 16 male students and 16 female students), found that most students still have not mastered the upper pass technique optimally. Many students experience difficulties in hand position, inaccurate contact with the ball, and lack of coordination between the eyes and body movements. The results of the practice test showed that only 11 people or (34%) of 32 students achieved the Minimum Completion Criteria (KKM) set at 75, while the remaining 21 (66%) were still below the standard. In addition to observations, researchers also conducted interviews with PJOK teachers related to the material on large ball games, especially volleyball, there were difficulties for students in performing upper passes, this was because when practicing, the teacher did not use an interesting approach or method, the teacher only asked students to practice directly. This shows that students' ability in mastering the basic techniques of upper passes is still low and needs to be improved.

These difficulties are thought to be caused by learning methods that are still one-way and lack active student engagement. Students tend to simply receive instructions without being given the opportunity to explore or actively participate in the learning process. As a result, student motivation and interest in physical education (PJOK) are low, and learning outcomes fall short of expectations. According to Priyono (2018), an active approach like PAIKEM can improve student participation and skill development in physical education (PJOK). Fitriyah & Nuryadi (2019) also stated that PAIKEM is effective in improving student learning outcomes because it accommodates different learning styles and creates a fun learning environment. These principles are also consistent with motor-learning evidence showing that observation of appropriate movement models and well-timed feedback can improve motor-skill learning in physical education (Han et al., 2022a, 2022b). In volleyball learning, this means that students need opportunities to see correct technique, practice repeatedly, receive specific correction, and remain actively engaged in the task.

To address these issues, the PAIKEM (Active, Innovative, Creative, Effective, and Enjoyable Learning) approach is the right solution. According to Fitriyah and Nuryadi (2019), PAIKEM can increase student engagement and the overall effectiveness of physical education (PJOK) learning. This approach actively engages students in learning through enjoyable and varied activities. Accordingly, this study aimed to improve the overhead-passing skills of fifth-grade students at Tubunaus State Elementary School through the PAIKEM approach. The study also examined how students' mean scores, mastery percentage, and observed technical performance changed from the baseline pretest through Cycle I and Cycle II.

METHOD

Research Design

This study used Classroom Action Research (CAR) because the purpose was to improve an identified learning problem through iterative classroom action and reflection. The study followed the action-research cycle of planning, action, observation, and reflection described by Kemmis, McTaggart, and Nixon (2014). A baseline pretest was conducted before the intervention. The action was then implemented in two cycles, with two meetings in each cycle. Findings from Cycle I were reviewed during reflection and used to refine the learning focus in Cycle II, particularly the correction of hand and foot positioning during the overhead pass.

Participants and Setting

The participants were one intact fifth-grade class at Tubunau State Elementary School consisting of 32 students, including 16 boys and 16 girls. All students in the class participated in the classroom action. The school KKM for PJOK was 75; therefore, a score of 75 or higher was classified as mastery for reporting individual and class learning outcomes.

Instruments and Data Collection

The primary outcome measure was a practical overhead-passing test scored on a 0–100 scale. The practical assessment focused on the technical problems identified during the baseline observation and subsequent reflection, including foot and body position, hand position, ball contact and control, movement coordination, and successful execution of the overhead pass. Teacher and student observation sheets were used to document the implementation of learning activities, student participation, attention to technique, and recurring errors during practice. Descriptive knowledge questions were used as supporting evidence of students' understanding of the technique. Lesson plans (RPP) and attendance records were used to maintain consistency of the learning process across meetings. The same KKM threshold was applied at each assessment stage so that changes in mastery could be compared consistently.

Data Analysis

Quantitative data were analyzed descriptively because CAR focuses on improvement within the participating class rather than comparison between randomized groups. For each assessment stage, the class mean and the number and percentage of students achieving KKM were calculated. To describe the magnitude of improvement relative to the maximum score of 100, class-average normalized gain was calculated as $g = (\text{posttest mean} - \text{pretest mean}) / (100 - \text{pretest mean})$. Following Hake (1998), normalized gain was interpreted as low ($g < 0.30$), medium ($0.30 \leq g < 0.70$), or high ($g \geq 0.70$). Observation notes were analyzed descriptively during reflection to identify technical and participation problems that should be addressed in the next cycle. No inferential test was used because the study did not include a comparison group.

RESULTS AND DISCUSSION

Overall Learning Outcomes

Table 1 summarizes the progression of overhead-passing outcomes. The class mean increased at every stage, while the proportion of students meeting KKM increased from 6.25% at baseline to 46.87% after Cycle I and 100% after Cycle II. Relative to the pretest mean, normalized gain was 0.57 after Cycle I (medium) and 0.95 after Cycle II (high).

Table 1. Summary of overhead-passing learning outcomes

Assessment stage	Mean score	Students ≥ 75	Mastery (%)	N-gain vs. pretest
Pretest	33.12	2/32	6.25	—
Cycle I posttest	71.25	15/32	46.87	0.57 (medium)
Cycle II posttest	96.87	32/32	100.00	0.95 (high)

Baseline Pretest

The pretest established the initial level of performance before the PAIKEM action was introduced. The mean score was 33.12, and only 2 of 32 students (6.25%) achieved the KKM of 75. Thus, 30 students (93.75%) had not yet demonstrated the expected level of mastery. The individual pretest scores are presented in **Figure 1**. The baseline result was consistent with the observed technical difficulties. Most students were still learning how to organize the body before contact with the ball and how to coordinate the hands, legs, and direction of force. This finding justified an instructional response that emphasized active practice and specific technical feedback rather than simple repetition without correction.

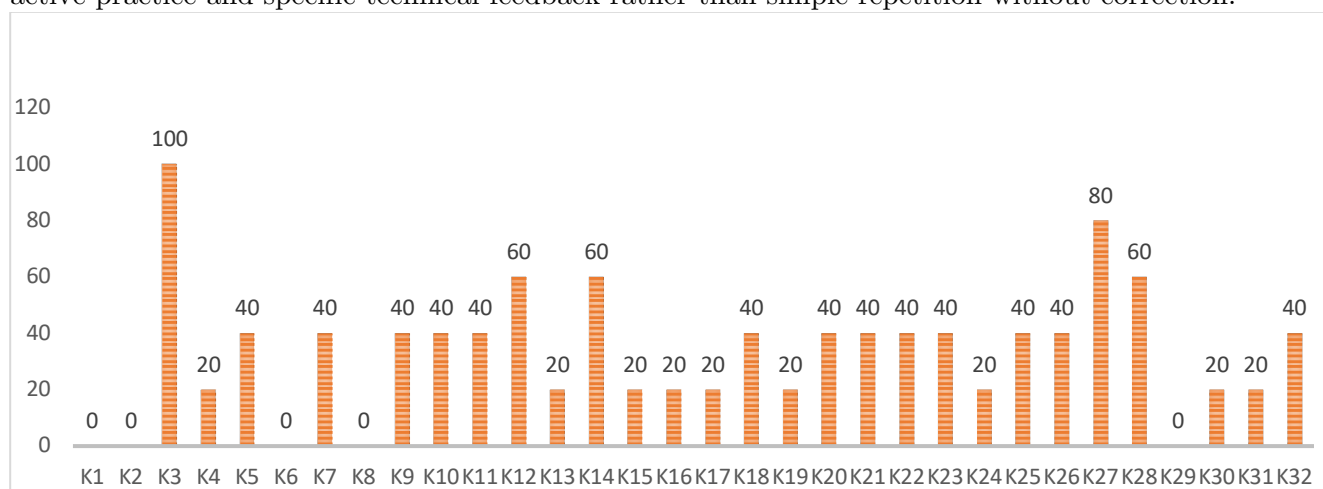


Figure 1. Individual pretest scores

Cycle I and Cycle II results

Cycle I was implemented in two meetings using the prepared lesson plan and PAIKEM principles. After Cycle I action, the mean score increased to 71.25. Fifteen students (46.87%) achieved the KKM, whereas 17 students (53.13%) remained below the criterion. The normalized gain from the pretest to Cycle I was 0.57, which represents a medium improvement. Individual Cycle I scores are shown in **Figure 2**. Although the class improved substantially, the Cycle I reflection showed that mastery was not yet sufficient. Students who remained below KKM frequently showed inconsistent foot position, incorrect hand position, and limited attention to the sequence of the overhead-pass movement. These observations were used directly in planning Cycle II. The next cycle therefore placed greater emphasis on explicit correction of

the starting position and hand configuration before students continued with repeated overhead-passing practice.

Cycle II was also conducted in two meetings. At the first meeting, the learning process emphasized correction and reinforcement of the hand and foot positions that had caused difficulty in Cycle I. Practice then continued using the PAIKEM approach, with students repeatedly applying the corrected movement during active learning tasks. At the end of the cycle, the class mean reached 96.87 and all 32 students (100%) achieved the KKM. The normalized gain from the pretest to Cycle II was 0.95, classified as high. Individual Cycle II scores are shown in Figure 3.

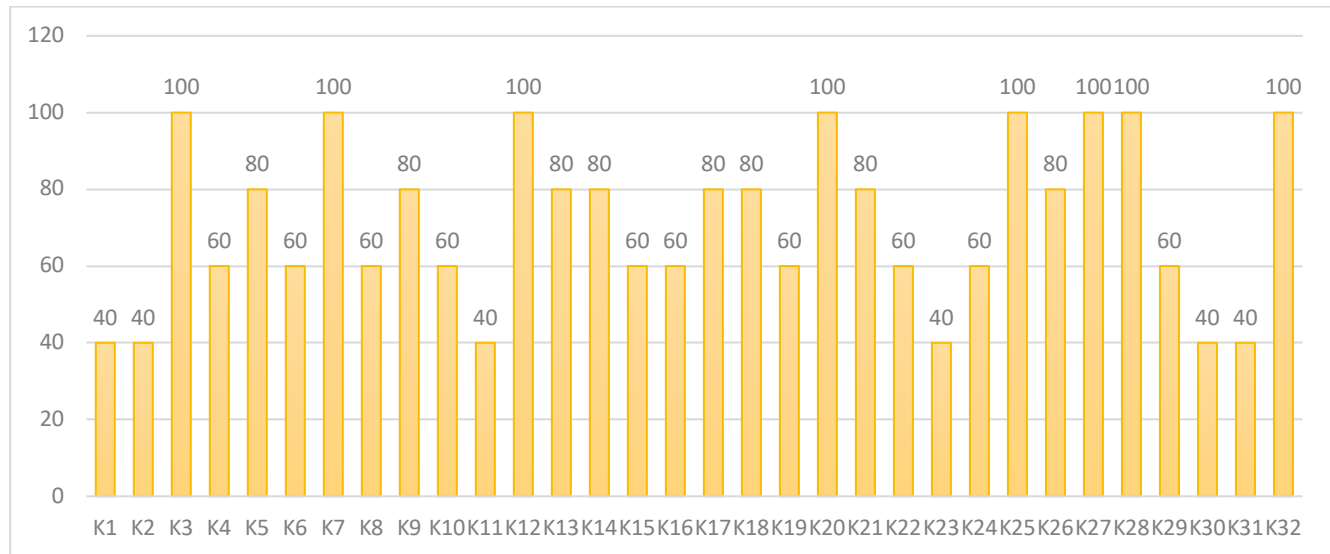


Figure 2. Individual posttest scores in Cycle I

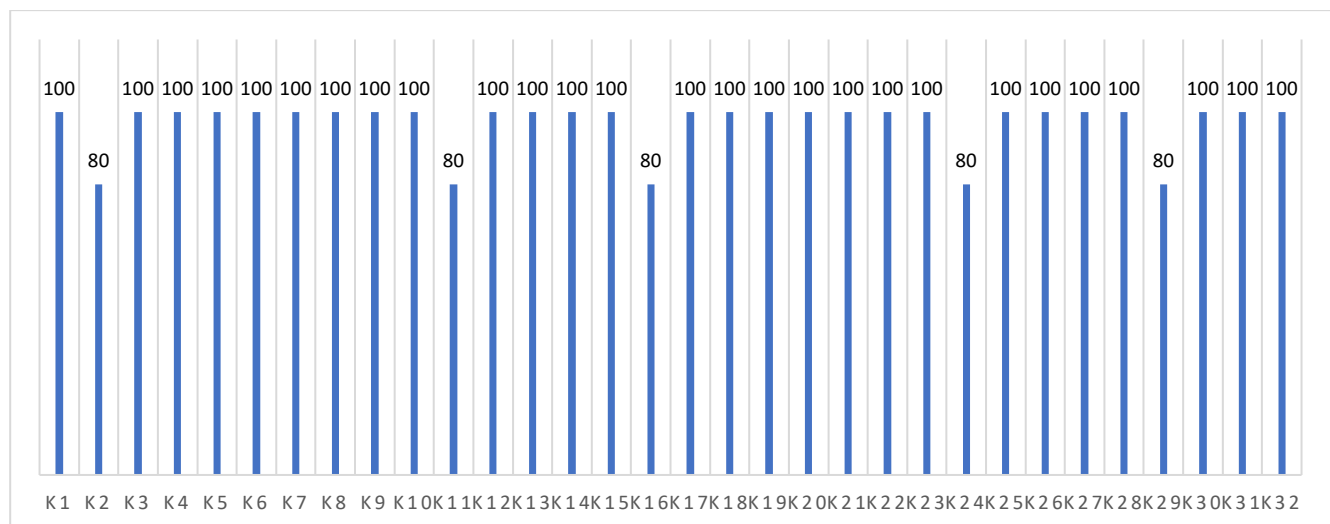


Figure 3. Individual posttest scores in Cycle II

Comparison and Discussion

The mean-score progression from 33.12 to 71.25 and then to 96.87 is illustrated in Figure 4. The pattern is consistent with the mastery percentages: the class moved from 6.25% mastery at baseline to 46.87%

after the first cycle and 100% after the second cycle. Importantly, the Cycle I result was used diagnostically rather than treated as an endpoint; the remaining technical errors informed the focus of the second action cycle.

The improvement is pedagogically plausible because PAIKEM requires students to be active participants in learning while teachers adapt activities in response to observed difficulties. Priyono (2018) describes PAIKEM as an approach that promotes active, innovative, creative, effective, and enjoyable learning rather than passive reception. In the present study, this orientation was particularly relevant after Cycle I, when reflection identified specific movement errors that could be corrected through more focused practice in Cycle II. The findings also align with broader evidence on motor-skill instruction. Systematic reviews indicate that observational learning and appropriately delivered feedback can improve motor-skill learning in physical education (Han et al., 2022a, 2022b). For a skill such as the overhead pass, students benefit when they can observe the expected movement, attempt it repeatedly, and receive information about the quality of their performance. The strong Cycle II improvement is consistent with this mechanism because the second cycle explicitly targeted the hand and foot positions that had remained problematic in Cycle I.

The result is also consistent with volleyball-specific research showing that instructional strategy matters for overhead-passing learning. Akhmad et al. (2022) found differences in overhead-passing outcomes across learning strategies, while Aryanti et al. (2022) developed and validated a game-understanding-based overhead passing model for elementary-school students. Together with the present classroom data, these studies support the use of structured, student-centered, and feedback-rich volleyball instruction instead of relying only on undifferentiated repetitive practice. Several limitations should be considered. This CAR involved one class and did not include a control group, so the results provide evidence of classroom improvement rather than a causal estimate that can be generalized to all schools. In addition, the original classroom instruments did not report formal psychometric coefficients; future studies should document the scoring rubric in detail and examine inter-rater reliability or instrument validity. Despite these limitations, the consistent increase in mean scores, mastery percentage, and normalized gain across the two reflective cycles provides a coherent record of improvement in this class.

CONCLUSION

The implementation of PAIKEM-based classroom actions was associated with substantial improvement in the overhead-passing skills of fifth-grade students at Tubunaus State Elementary School. The class mean increased from 33.12 at pretest to 71.25 after Cycle I and 96.87 after Cycle II. The number of students achieving the KKM of 75 increased from 2 students (6.25%) to 15 students (46.87%) and finally to 32 students (100%). The class-average normalized gain was 0.57 after Cycle I and 0.95 after Cycle II. Reflection after Cycle I showed that hand and foot positioning remained the main technical problems; targeting these problems in Cycle II coincided with complete class mastery. Within the scope of this classroom action research, PAIKEM provided a useful framework for active practice, targeted correction, and iterative improvement of volleyball overhead-passing performance.

Acknowledgment The researcher would like to express her deepest gratitude to the Principal of Tubunaus State Elementary School, the teachers, and the fifth-grade students who have provided the opportunity, time, assistance, and cooperation to the researcher in conducting the research. The researcher greatly appreciates the willingness of the teachers who have accepted and given permission to the researcher to conduct the research at Tubunaus State Elementary School. The researcher would also like to express her gratitude to the fifth-grade students who have been willing to take the time, participate in every research activity, and provide the information and data needed during the research process. The support, openness, friendliness, and cooperation provided greatly assisted the researcher in completing this research well. The researcher realizes that without the assistance and support from various parties, this research could not have been carried out properly. May all the kindness and assistance that have been given be rewarded abundantly by God Almighty.

Data Availability The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical approval All procedures performed in the study followed the ethical standards.

Consent for publication All authors have read and agreed to the published version of the manuscript.

Consent to participate Consent to participate was obtained from all individual participants included in the study.

Informed consent Informed consent was obtained from all individual participants included in the study. Data were reported anonymously in the study.

Conflict of interest The authors declare no competing interests.

REFERENCES

- Akhmad, I., Suharjo, Hariadi, Dewi, R., & Supriadi, A. (2022). The effects of learning strategies on senior high school students' motivation and learning outcomes of overhead passing in volleyball. *International Journal of Education in Mathematics, Science, and Technology*, 10(2), 458–476. <https://doi.org/10.46328/ijemst.2291>
- Aryanti, S., Azhar, S., Tangkudung, J., Yusmawati, Ilahi, B. R., & Okilanda, A. (2022). Teaching Games for Understanding (TGfU) model learning for overhead pass volleyball in elementary school students. *International Journal of Human Movement and Sports Sciences*, 10(4), 677–682. <https://doi.org/10.13189/saj.2022.100407>
- Drenowatz, C., Hinterkörner, F., & Greier, K. (2021). Physical fitness and motor competence in Upper Austrian elementary school children—Study protocol and preliminary findings of a state-wide fitness testing program. *Frontiers in Sports and Active Living*, 3, 635478. <https://doi.org/10.3389/fspor.2021.635478>
- Dudley, D., Mackenzie, E., Van Bergen, P., Cairney, J., & Barnett, L. (2022). What drives quality physical education? A systematic review and meta-analysis of learning and development effects from physical education-based interventions. *Frontiers in Psychology*, 13, 799330. <https://doi.org/10.3389/fpsyg.2022.799330>
- Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66(1), 64–74. <https://doi.org/10.1119/1.18809>

- Han, Y., Syed Ali, S. K. B., & Ji, L. (2022a). Use of observational learning to promote motor skill learning in physical education: A systematic review. *International Journal of Environmental Research and Public Health*, 19(16), 10109. <https://doi.org/10.3390/ijerph191610109>
- Han, Y., Syed Ali, S. K. B., & Ji, L. (2022b). Feedback for promoting motor skill learning in physical education: A trial sequential meta-analysis. *International Journal of Environmental Research and Public Health*, 19(22), 15361. <https://doi.org/10.3390/ijerph192215361>
- Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The Action Research Planner: Doing Critical Participatory Action Research*. Springer. <https://doi.org/10.1007/978-981-4560-67-2>
- Priyono. (2018). The implementation of PAIKEM (Active, Innovative, Creative, Effective, and Exiting Learning) and conventional learning method to improve student learning results. *Journal of Social Studies Education Research*, 9(2), 124–137. <https://doi.org/10.17499/jsser.65763>