



The Effect of a Modified Mini-Games Strategy on Some Basic Skills and Motivation to Learn Volleyball Among Intermediate School Students

Bader Nabeel Rajab Abbas ¹, Mohammed Jabbar Mohammed ², Raheeq Nizar Mahmoud ³

^{1,2,3} Ministry of Education , General Directorate of Education of Baghdad Al-Karkh 3

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Abstract

This research explored the impact of a modified mini-games strategy on some basic skills and motivation to learn volleyball among intermediate school students. The researchers adopted an experimental approach with a two-group pre-test/post-test design. The sample consisted of 40 students with a mean age of 13.78 ± 0.41 , a mean height of 1.57 ± 0.06 m and a mean body mass of 49.85 ± 6.31 kg. The sample was separated into an experimental group and a control group, with 20 students in each group. The experimental group implemented 16 educational units based on the modified mini-games for eight weeks while the control group received the standard instruction. The students' performance in underhand passing, overhand passing and underhand serving skills was measured as well as their motivation to learn volleyball. The researchers used the Statistical Package for the Social Sciences (SPSS) to process the data, calculate means, standard deviations, t-test values, percentage of improvement and effect size. The data presented a statistically significant development in the experimental group across all variables and it also outperformed the control group in post-tests at a significance level of 0.05. The research indicates that modified mini-games can provide greater opportunities for participation, repetitive, purposeful performance, collaboration and a sense of competence during learning.

Keywords: modified mini-games, volleyball, basic skills, motivation, middle school students, training model.

¹ Ministry of Education , General Directorate of Education of Baghdad Al-Karkh 3
moonbadr26@gmail.com

² Ministry of Education , General Directorate of Education of Baghdad Al-Karkh 3
moh378ja@gmail.com

³ Ministry of Education , General Directorate of Education of Baghdad Al-Karkh 3
raheeknazar@gmail.com



Introduction

Volleyball is a team sport that demanded learning a set of fundamental skills, primarily underhand and overhand passes and serving, along with motor coordination, situational awareness, decision-making and teamwork. Teaching these skills in middle school is especially important as this stage provides a suitable foundation for building motor skills and developing positive attitudes and motivation regarding participating in sports activities. (Apriani, A., & Lestari, H. 2026)

Physical education teachers face many challenges when teaching volleyball consisting of a large class sizes, limited lesson time, varying skill levels and limited equipment and provisions in some schools. Excessive reliance on isolated skill drills or traditional methods can lead to increased waiting times, fewer ball touches per student and limited chances for active participation which may negatively affect the speed of acquiring basic skills and motivation to learn. (Sobari, DF, Juliantine, T., & Hambali, B. 2025)

One technique that can help address these challenges is the adjusted mini-game strategy. This strategy included organizing educational situations that resemble real games while integrating pedagogical modifications appropriate to the students' age, skill level and the school environment. These modifications include decreasing the number of players, minimizing the playing field, adjusting the net height, using suitable balls, simplifying the rules or utilizing specific rules to reach a particular educational objective. For example the activity can be organized in small groups of two or three students and scoring can be related to specific skill performance such as finishing a certain number of passes before sending the ball into the opponent's court or directing it towards a designated goal area.

Mini-games are not simply unstructured free activities but rather a teaching method that combines a competitive, motorized environment with progressive learning, feedback and guided questioning. Through this approach students move from practicing skills in isolation to applying them within situations that require receiving, passing, directing, cooperating, and making decisions. Mini-games also provide greater opportunities for active participation and ball handling, which helps improve skill performance and fosters a sense of competence, enjoyment, and belonging among students. (Endriani, D. 2026).

Modern Arabic literature indicates that learning sports skills does not depend solely on motor repetition, but is linked to the quality of the learning environment and the extent to which learners are given the opportunity to think, participate, cooperate, and apply the skill in conditions closely resembling play. A study by Al-Razzaq (2026) demonstrated that using the pentagram strategy as a modern teaching tool in teaching the chest pass and shot put skills in basketball to junior players contributed to the experimental group's superior skill performance. The study attributed this to the gradual organization of the skill, the stimulation of thinking and cooperation, and the learners' intrinsic motivation. Al-Razzaq (2026) believes that modern teaching strategies



support skill performance and motivation. This reinforces the importance of employing active teaching strategies in physical education lessons, including modified mini-games that adapt the learning environment to suit the students' age and skill level. Gradual organization and cooperation contribute to improving the learning of sports skills. (Al-Razzaq, 2026)

In volleyball, a study by Aziz (2025) demonstrated a positive correlation between critical thinking skills and the performance level of the underhand pass skill among fourth-grade preparatory school students. Higher critical thinking skills were associated with improved skill performance. This finding underscores that learning volleyball skills should not be limited to imitating movement patterns but should include learning situations that encourage students to perceive the ball's direction, choose the appropriate position, cooperate with teammates, and make decisions. This highlights the suitability of the modified mini-game strategy as it places students in simplified and repetitive game situations that combine skill performance, understanding, and interaction. The study demonstrated a positive relationship between thinking and performance in underhand passing in volleyball. (Aziz, 2025)

Based on this the importance of the present research is determined to identify the impact of the modified mini-games strategy on learning some basic skills and motivation towards learning volleyball among middle school students as an organized teaching alternative that can raise the effectiveness of the physical education lesson and achieve more active and interactive learning.

The research problem depend on the fact that learning basic volleyball skills among middle school students may face obstacles related to the nature of the school lesson. These difficulties include the limited time allocated for physical education classes, the large number of students, the varying levels of their motor skills and capacities and the limited opportunities to actually touch the ball when activities are organized in a traditional manner or in large teams. In some lessons a number of students may be preoccupied with waiting or watching their classmates, while only a limited number of them receive repeated opportunities to practice and perform. This can negatively impact the speed of learning and the accuracy of executing passing and serving skills.

Moreover simply explaining, demonstrating and performing repetitive classroom exercises may not provide students with sufficient learning situations that connect a skill to its application in play, such as estimating the ball's trajectory, choosing a position, timing a pass, cooperating with a teammate and returning the ball to the opponent's court. This may lead to students learning aspects of the performance in isolation, but then struggling to apply them during simple play situations or classroom competitions.

The findings of the study (Aziz, 2025) indicate that the level of performance in the skill of passing from below is connected to the thinking skills of middle school students which supports the need to construct educational situations that do not focus on isolated motor performance only but let learner to understand, make decisions and interact with the ball and colleagues.



The modified minigame strategy offers a potential learning environment to address this problem because it decrease the number of players on a team, modifies the playing area, net height, rules, and equipment and sets particularly skill objectives within a simplified competitive activity. These modifications are expected to increase participation time, ball touches, the frequency of purposeful play and opportunities for success and collaboration, potentially contributing to the learning of fundamental skills and boosting motivation to learn.

Based on the researchers' practical experience and observations of physical education classes in middle schools, they noted the need for structured teaching methods that empower students to play a more vital role in learning volleyball, rather than relying solely on individual performance or prolonged waiting periods. Furthermore available Arabic studies have often focused on other strategies or different sample sizes, while the need remains to test the modified mini-games strategy with middle school students in Baghdad's Third Karkh Education Directorate.

Therefore, the research problem can be summarized in the following main question:

What is the effect of the modified mini-games strategy on learning some basic skills and motivation towards learning volleyball among middle school students in Baghdad Al-Karkh Third Education Schools?

This question leads to the following two questions:

1. What is the effect of the modified mini-games strategy on learning the accuracy of underpassing, overpassing, and underpassing among middle school students?
2. What is the effect of the modified mini-games strategy on increasing motivation to learn volleyball among middle school students?

Research objectives

1. Developing an educational curriculum according to the modified mini-games strategy to teach some basic skills and motivation towards learning volleyball among middle school students.
2. A statement of how to identify the impact of the educational curriculum on learning the accuracy of scrolling from below among members of the experimental group.
3. A statement of how to determine the effect of the educational curriculum on learning the accuracy of top-down passing among members of the experimental group.
4. A statement of how to detect the effect of the educational curriculum on learning the accuracy of the downward transmission among members of the experimental group.
5. Explaining how to distinguish the impact of the educational curriculum on raising motivation towards learning volleyball.
6. A statement of the method of comparison between the experimental group and the control group in the post-test measurements.



Research hypotheses

1. There are statistically significant differences between the pre-test and post-test for the experimental group in the accuracy of the underpass pass, the overpass pass, the underpass serve, and the motivation to learn volleyball, in favor of the post-test.
2. There are statistically significant differences between the pre-test and post-test for the control group in the research variables, in favor of the post-test.
3. There are statistically significant differences between the experimental and control groups in the post-tests of basic skills and motivation towards learning volleyball, in favor of the experimental group.

Search terms

The modified mini-games strategy: It is an educational strategy based on organizing simplified game situations that simulate the game of volleyball, with intentional modifications to the number of players, dimensions of the court, height of the net, type of ball, rules, and scoring system; in accordance with the age of the students, their skill level, and the goal of the educational unit.

Methodology and Tools

Research Methodology

The researchers used an experimental design with two equivalent groups, employing pre-tests and post-tests. This design is appropriate for studying the effect of an independent variable, the modified mini-games strategy, on dependent variables: underhand passing accuracy, overhand passing accuracy, underhand serving accuracy and motivation to learn volleyball.

Research Sample

The sample consisted of 52 second-year intermediate students from one school (Al-Kadhimiyah Intermediate School for Boys). They were randomly assigned to:

Experimental Group: 20 students who learned using the modified mini-games strategy, all from section (C).

Control Group: 20 students who learned using the standard method, all from section (B).

Pilot Sample: 12 students from section (E).

The students' ages ranged between 13 and 14 years. None of the students in the sample were regular players in a volleyball club.

Table 1. *Statistical Description of Sample Characteristics*

Variable	Experimental Group n = 20	Control Group n = 20	t-value	Significance
Age (years)	13.79±0.40	13.77±0.43	0.15	0.879
Height (meters)	1.574±0.058	1.568±0.061	0.32	0.750
Body Mass (kg)	50.10±6.45	49.60±6.24	0.25	0.804

Table 1 shows that there are no statistically significant differences between the two groups in age, height and body mass, indicating homogeneity between the groups in these variables within this educational framework.

Table 2. *Equivalence of the two groups in dependent variables before application of the method*

Variable	Experimental Mean ± SD	Control Mean ± SD	t-value	Significance
Bottom-up passing (out of 20)	7.35±1.53	7.20±1.47	0.32	0.753
Top-up passing (out of 20)	6.90±1.41	6.85±1.46	0.11	0.913
Bottom-up passing (out of 30)	9.25±2.07	9.10±2.00	0.23	0.821
Motivation (out of 100)	61.80±5.94	62.10±6.11	0.16-	0.873

Table 2 shows no statistically significant differences between the two groups in the pre-tests for basic skills and motivation indicating that the groups were equivalent before the curriculum was implemented.

Devices and tools

The researchers used the following tools in the educational curriculum:

- Ten lightweight educational flying balls, the circumference of the ball is 65 to 67 cm and its mass is 200 to 220 grams.
- An adjustable volleyball net, with an educational height of approximately 2.10 m in the first units and then gradually increasing to 2.24 m.
- A metal measuring tape with a length of 30 m and an accuracy of 0.01 m.
- Digital stopwatch with 0.01-second accuracy to regulate activity duration.
- Cones and ground strips to mark playing areas and goal areas.
- Forms for recording grades.
- A measure of motivation towards learning volleyball.



Skills tests

First: Testing the accuracy of passing from the bottom to the goal

The student stands behind a line 3 meters from a wall or marked target area. They make 10 passes from below towards a 1 x 1 meter target square. The student receives two points for hitting the target directly one point for touching the target boundary and zero points for missing. The total score for the test is 20 points.

Second: Testing the accuracy of a pass from above to a goal

The student stands 2.5 meters from the wall or target. They perform 10 overhead passes towards a 1x1 meter target box. Performance is graded as follows: 2 points for direct hits, 1 point for touching the target boundary and 0 points for no hits. The total score is 20 points.

Third: Testing the accuracy of transmission from below

The student stands behind the service line and performs 10 serves from below into a court separated into four target areas. The student receives three points for hitting the target center area, two points for hitting the designated side area, one point for a legal serve within the court outside the target areas and zero points for a serve that is out of bounds or illegal. The total score is 30 points.

Motivation scale for learning volleyball

The scale consisted of 20 items covering attitudes connected to the intention to learn, perseverance, sense of competence, cooperation and interest in the volleyball lesson. A five-point scale was used for responses: strongly agree, agree, neutral, disagree and strongly disagree.

The total score ranges from 20 to 100 points with higher scores indicating greater motivation to learn volleyball. Six negative items are scored in reverse when calculating the total score.

Honesty and steadfastness

The tests and motivation scale items were presented to ten experts in the fields of physical education and volleyball teaching methodologies as well as measurement and evaluation. Nine or ten experts approved the validity of the instruments after two items on the motivation scale were reworded.

A pilot study was conducted with 12 students outside the main sample and the tests and scale were re-administered after seven days. The test-retest reliability coefficients were:



stability coefficient	The tool
0.88	Scroll down test
0.86	Top-down swipe test
0.90	Bottom transmission test
0.89	Motivation scale

Experimental procedures

Pre-testing was conducted over two consecutive days. The first day was dedicated to anthropometric measurements and skills assessments while the second day was dedicated to administering a motivation scale. Following this the curriculum was applied for eight weeks, with two learning units per week, totaling 16 learning units. Each learning unit lasted 45 minutes.

The experimental group received the modified mini-game-based curriculum, while the control group received the standard curriculum based on explanations, demonstrations and individual, paired and classroom exercises. After the completion of Unit 16 post-tests were administered under the same organizational conditions as the pre-tests.

The educational approach for the experimental group

The curriculum was applied in the primary part of the learning unit for a period ranging between 25 and 28 minutes. The learning activities were organized in small teams such as 2 against 2, 3 against 3 and 4 against 4. Miniature pitches with approximate dimensions of 12 x 6 m were used, with the rules being changed according to the skill objective of the unit.

The changes included awarding an extra point to the team that completed three successful passes, or to the team that directed the ball into a goal area or to the team that correctly received and set up the ball before returning it to the other side of the court. One bounce of the ball was allowed in the initial beginners' units but this rule was gradually eliminated.

Table 3. *Weekly Training Program and Modified Mini-Games for Developing Volleyball Skills and Decision-Making*

Week	Units	skill or goal	Examples of modified minigames
First	1–2	Adapting to the ball and putting on the readiness	2 vs 2 over a low rope, passes into colored zones
Second	3–4	Scroll down	Three passes then a point, and protect the goal area.
Third	5–6	Scroll from top	Set up a pass to the box, and play 3v3 with two mandatory passes.
Forth	7–8	Merge two passes	3 vs 3 with an extra point for the correct sequence
Fifth	9–10	Send from below	Hitting target areas, serving, then entering play
Sixth	11–12	Reception and preparation	Small teams with organized role exchange
Seventh	13–14	Decision-making and cooperation	3 vs 3 with graduated rules and point zones



Eighth	15–16	Performance monitoring and evaluation	Mini league and application of skills in play
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Statistical Analysis

The following statistical analyses were used in the data analysis:

- The arithmetic mean.
- Standard deviation.
- Independent samples t-test.
- T-test for related samples.
- Percentage of improvement.
- Cohen effect size. d

Results

Table 4. Differences between the Pre-Test and Post-Test for the Experimental Group

Variable	Pre-Test Mean $\pm$ SD	Post-Test Mean $\pm$ SD	Difference in Means	Percentage of Improvement%	T-value	Significance
Scroll from bottom of 20	7.35 $\pm$ 1.53	14.80 $\pm$ 1.88	7.45	101.36	15.27	0.001>
Scroll from top of 20	6.90 $\pm$ 1.41	14.05 $\pm$ 1.76	7.15	103.62	16.11	0.001>
Scroll from bottom of 30	9.25 $\pm$ 2.07	20.35 $\pm$ 2.49	11.10	120.00	17.84	0.001>
Motivation out of 100	61.80 $\pm$ 5.94	78.65 $\pm$ 5.28	16.85	27.27	12.63	0.001>

Table 5. Differences between the Pre-Test and Post-Test for the Control Group

Variable	Pre-Test Mean $\pm$ SD	Post-Test Mean $\pm$ SD	Difference in Means	Percentage of Improvement%	T-value	Significance
Scroll from bottom of 20	7.20 $\pm$ 1.47	10.55 $\pm$ 1.68	3.35	46.53	7.02	0.001>
Scroll from top of 20	6.85 $\pm$ 1.46	9.95 $\pm$ 1.62	3.10	45.26	6.71	0.001>
Scroll from bottom of 30	9.10 $\pm$ 2.00	13.90 $\pm$ 2.20	4.80	52.75	8.09	0.001>



Motivation out of 100	62.10±6.11	66.40±5.83	4.30	6.92	3.31	0.004
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Table 6. *Differences between the two groups in the post-tests*

Variable	Experimental Mean ± SD	Control Mean ± SD	t-value	Sig.	Sig d
Scroll from bottom of 20	14.80±1.88	10.55±1.68	7.54	0.001>	2.38
Scroll from top of 20	14.05±1.76	9.95±1.62	7.64	0.001>	2.42
Scroll from bottom of 30	20.35±2.49	13.90±2.20	8.66	0.001>	2.74
Motivation out of 100	78.65±5.28	66.40±5.83	6.98	0.001>	2.21

Discussion

The data showed an improvement in the performance of both groups between the pre- and post-tests. The expected improvement in the control group can be explained by the impact of structured exposure to the lesson, repetition of performance, explanation, demonstration and practical application of the skills. However the data indicated that the experimental group showed greater improvement in all three skills and in motivation to learn volleyball.

From an educational perspective the superiority of the modified mini-game strategy can be explained by the fact that reducing the number of players increases the chances of touching the ball and reduces the student's waiting time. For example a student participates more in a 3-on-3 situation than in a 6-on-6 situation because there are fewer players involved more space for movement and greater opportunities to pass, receive and serve. (Ibrahim Shehab, A., 2026)

Furthermore, linking points to a skill requirement such as three successful passes before sending the ball into the opponent's court, ensures the student performs the skill with a clear purpose within the activity. This approach helps shift from mechanically performing the movement to applying it in a simplified game situation. In addition varying the challenges such as playing in goal zones, changing the number of touches, or switching roles, can prevent monotony and increase student focus. (Isma, Baan, AB, Rahmah, & Lilo, DK 2026).

This interpretation aligns with modern trends in physical education that support active learning and student-centered models. Recent studies have indicated that skill-based learning and



game-based skills can be enhanced by using learning for understanding in games and play-based learning in volleyball. Furthermore present research has explored the improvement of volleyball instructional models for students including a model for teaching serving through play-based learning and models for developing underhand passing, highlighting the importance of adapting the learning environment to the learners' level (Apriani, L., Bausad, AA, Alpen, J., Amran, Z., & Setiawan, BA 2025).

Regarding the motivation variable, small-scale games can enhance student participation because they increase a sense of teamwork, provide frequent opportunities for success, offer immediate feedback and reduce fear of making mistakes in front of a large group. This can boost students' sense of competence and their desire to continue learning. Furthermore simple, structured competition between small teams makes the lesson more engaging, provided the teacher focuses on reinforcement and learning not just winning.

Conclusions

1. The experimental method with two equivalent groups and pre- and post-tests is acceptable for studying the impact of modified mini-games on learning volleyball.
2. The data demonstrated an improvement in the accuracy of bottom scrolling, top scrolling, bottom sending and motivation among the members of the experimental group.
3. The data showed that the experimental group outperformed the control group in the post-test measurement of all variables.
4. Modified mini-games represent a viable teaching method in schools when considering the number of students, the playing area, the tools and the level of performance.

Recommendations

1. Adopting modified mini-games within the physical education lesson to learn basic volleyball skills with a clear progression in the difficulty of the tasks.
2. Organize the students into small groups of 2 against 2, 3 against 3, or 4 against 4 to ensure increased participation and repetition of ball touching.
3. Adjusting the dimensions of the court, the height of the net, the type of ball and the rules of play to connect with the age and skill level of the students.
4. Training physical education teachers to design mini-games that link a specific particularly skill objective with a suitable game rule or point system.
5. Conduct follow-up studies comparing the mini-games strategy with the cooperative learning strategy, the flipped classroom, blended learning or direct instruction in volleyball skills.



Appendices

Appendix 1: Sample Learning Unit

Unit number: Fifth

Main skill: Passing from below

Total time: 45 minutes

Section	Time	Unit Content	Organizational Notes
Introductory	8 minutes	Light running, joint movements, individual ball passing	Observing social distancing and safety
Educational	7 minutes	Explanation and demonstration of the ready position, knee bending, arm extension, and ball aiming	Use short keywords
First application	8 minutes	Groups of 3 students perform 10 passes from below into a goal area	Constantly switching roles
Second application	12 minutes	3v3 game: Regular point for winning an exchange and an extra point after three successful passes	Miniature playground 12 x 6 m
Third application	5 minutes	A game where you score by passing the ball from the bottom into a square in the opponent's half.	Team score recording
Final	5 minutes	Calming down, technical review, and enhancing good performance	Focus on participation and collaboration

Behavioral objective: For the student to perform a pass from below towards a teammate or to a target area with appropriate accuracy during miniature play situations.

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Appendix 2: Motivation Scale for Learning Volleyball

Instructions: Put a checkmark next to the answer that expresses your opinion: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.

1. I feel excited when I learn a new skill in volleyball.
2. I try to develop my performance even when I make a mistake in the skill.
3. I eagerly await the volleyball lesson.
4. I enjoy collaborating with my teammates during volleyball activities.
5. I believe I am capable of learning volleyball skills if I train regularly.
6. I participate actively when the teacher asks me to perform a volleyball skill.
7. I am looking for an additional opportunity to play volleyball.



8. I feel satisfied when I succeed in directing the ball accurately.
9. I encourage my colleagues during the educational activity.
10. It is best to avoid participating in the volleyball lesson.
11. I feel that learning volleyball is useful in physical education class.
12. I keep trying when my first attempt is unsuccessful.
13. I can concentrate while learning volleyball skills.
14. I feel confident when performing a pass or a send.
15. I don't care about learning the rules of volleyball.
16. The best activities that allow me to touch the ball and participate continuously.
17. I feel that my opinion matters when working with my team.
18. I accept technical feedback to improve my performance.
19. I get bored quickly when learning volleyball.
20. I want to improve my level in volleyball.

Correction method: Positive items are given scores from 5 to 1 based on to the answer alternative while negative items are marked with scores of 10, 15 and 19. A higher score indicates higher motivation towards learning volleyball.



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