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The Effect of Special Exercises on Developing Motor Response Speed and the Skills of Euro Step Layup and Floater Shoot for Basketball Players Under 16

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Abstract

The significance of this research lies in preparing special exercises to develop motor response speed and the skills of Euro Step Layup and Floater Shoot for basketball players under 16 years of age. These exercises were designed to enhance players' ability to perceive situations, analyze information, and make the correct decision. The research problem was identified in the difficulties faced by some players in motor response speed, which directly influences decision-making during offensive construction under defensive congestion. Additionally, a weakness was observed in the performance of the Euro Step Layup and Floater Shoot skills, which are now essential alternatives to the traditional layup. The research aimed to investigate the impact of these special exercises on developing motor response speed and the two aforementioned skills among under-16 basketball players. The researcher employed the experimental method with two equivalent groups (experimental and control) using pre- and post-tests, as it suited the nature of the research. The sample consisted of 12 players from Al-Rawdhatain Sports Club, registered in the Iraqi Basketball Federation activities for the 2024–2025 season. They were randomly divided into two groups of six players each. Pre-tests were conducted on Saturday, 2 November 2024, at 3:00 PM in Al-Hindiya Sports Hall, Karbala. The special exercises prepared by the researcher began on Wednesday, 6 November 2024, during part of the main training session, and concluded on Sunday, 29 December 2024, lasting for eight weeks with three training units per week. Appropriate statistical methods were applied to analyze the pre- and post-test results, leading to the following conclusions:

-The effectiveness of the special exercises in developing motor response speed, Euro Step Layup, and Floater Shoot skills.

-Statistically significant differences were observed in favor of the experimental group across motor response speed, Euro Step Layup, and Floater Shoot skills.

Keywords:
Special exercises, motor response speed, Euro Step Layup, Floater Shoot.

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1. Introduction and Importance of the Research

Basketball is regarded as one of the most rapidly evolving team sports, having amassed a considerable following across numerous nations worldwide. This dynamic sport demands a distinct amalgamation of physical, technical, and mental prowess from its players. In light of the continuous and rapid evolution of defensive and offensive playing systems, it has become imperative for players to possess high individual competencies to achieve dominance on the court and ensure victory for their teams. The game's outcome is contingent on minute details and subtleties, necessitating players to hone their skills and adapt to the ever-changing dynamics of the sport.

In order to develop players according to each stage of preparation, especially in the phase where there is a significant focus on enhancing players' technical, tactical, and skill aspects, coaches strive to place players in situations that closely resemble or replicate actual game conditions and simulate competition scenarios. These conditions are meticulously designed to exceed the demands of real-world competitions, encompassing the endurance of both psychological and physical pressures.

This objective is realized through a comprehensive understanding of the players' physical attributes, technical skills, and functional capabilities, complemented by an analysis of the disparities among them. In light of the foregoing assessment, the training curriculum is meticulously designed to align with the abilities and capacities of the players. This developmental stage, spanning from infancy to early adolescence, is of particular significance in the formation of players' technical and physical capabilities. It is during this period that the foundational competencies that will underpin their future athletic performance are established. Consequently, a strategic emphasis on cultivating fundamental competencies and their subsequent integration into sophisticated offensive techniques can markedly elevate performance levels and facilitate the attainment of advanced levels of proficiency in the sport.

One of the most important abilities that players must possess is motor response speed, as it is a pivotal element that directly affects performance effectiveness from various aspects of the game. This ranges from making quick decisions to accurately executing complex technical skills. The offensive process in basketball has become more complex than before, as penetrating and finishing at the basket has become more difficult due to defensive formations, the increased height of players, and their enhanced ability to counter and reduce the effectiveness of the offense.

Therefore, players must possess many modern skills that help them break through defensive formations. One such skill is the Euro Step Layup, which allows the player to skillfully change direction to avoid defenders and reach the basket by moving in space and exploiting the best angle for the offensive finish. Another skill is the Floater Shot.

This skill serves as an effective solution for scoring points over tall defenders inside the restricted area without the need for direct physical contact. Both of these skills rely on the player's technical ability, rapid response to changing situations on the court, and the capacity to process information, make decisions, and execute them within fractions of a second, as basketball is a timed game during the offensive phase. The importance of this research lies in the preparation of specific exercises to develop motor response speed and the skills of the euro step layup and floater shoot for under-16 basketball players. These exercises were designed to enhance the aforementioned variables to improve the players' abilities to perceive situations, analyze information, and make correct decisions. Each of these situations has a specific objective that we aim to achieve by providing sufficient time and repetition during the training sessions.

1.2 Research Problem

Modern basketball is characterized by speed and intensity throughout the match, requiring players to possess high levels of physical, technical, cognitive, and functional capacities that enable them to maintain effective performance from start to finish. Through his experience as both a player and an observer of tournaments, the researcher noted that some players face difficulties with motor response speed, which directly affects their decision-making during offensive construction against defensive congestion. This often results in turnovers, violations, or blocked shots. Furthermore, weaknesses were also observed in performing the Euro Step Layup and Floater Shoot—skills that should be mastered as effective alternatives to the traditional layup. This deficiency stems from training programs that emphasize general physical preparation and basic skills while neglecting deeper development of perceptual-motor skills. Therefore, the researcher proposed this study by designing special exercises that simulate competitive conditions, emphasizing compound and modern skills, in response to the rapid developments in the game.

Research Objectives

1. To prepare special exercises aimed at developing motor response speed and the skills of Euro Step Layup and Floater Shoot for under-16 basketball players.
2. To identify the effect of these exercises on the development of motor response speed and the two skills.

Research Hypothesis

The researcher hypothesizes that the special exercises will have a significant effect on developing motor response speed as well as the skills of Euro Step Layup and Floater Shoot among under-16 basketball players.

Research Fields

1. Human Field: Under-16 players of Al-Rawdhatain Sports Club, registered in the Iraqi Basketball Federation for the 2024–2025 season.
2. Time Field: From 10 September 2024 to 26 December 2024.
3. Place Field: Al-Hindiya Indoor Sports Hall, Karbala.

2. Methodology and Field Procedures

2.1 Research Method:

The researcher adopted the experimental method using two equivalent groups (experimental and control) with pre- and post-tests, as it is suitable for the problem under study.

Table 1

Experimental Design of the Research Sample

Group	The prior test	Experimental treatment	The next test
Experimentally	1. The speed of the response 2-euro step layup 3-Floater Shoot	Special exercises prepared by the researcher.	1- Motor response speed 2- euro step layup 3- Floater Shoot
Control	1- Motor response speed 2- euro step layup 3- Floater Shoot	Exercises prepared by the trainer	1- Motor response speed 2- euro step layup 3-Floater Shoot

2.2 Research Population and Sample

The research population consisted of youth basketball players under 18 years old from Al-Rawdhatain Sports Club. The sample included 12 players randomly divided into two groups (experimental and control), with six players each.

2.3 Tools and Devices Used in the Research

The researcher used multiple methods and tools to collect data:

- Observation
- Interviews
- Tests and measurements
- Arabic and foreign references
- Internet resources

Devices and equipment included: Laptop (Lenovo), Casio calculator, electronic stopwatch, plastic markers of varying heights and colors (15), basketballs (Molten, 12), whistles (2), colored pens (5), measuring tape (7 meters), adhesive tape, and colored tennis balls (10).

2.4 Field Procedures

After reviewing numerous scientific sources and prior studies, the researcher selected and adapted a set of tests specifically suited to basketball. These were submitted to a panel of experts specializing in sports training and basketball, who unanimously approved their validity.

2.4.1 Motor Response Speed Test (Nelson Test)

Purpose: To measure the ability to respond and move quickly and accurately in reaction to a chosen stimulus.

Equipment: A flat surface (20m × 2m), stopwatch, measuring tape.

Procedure: The subject stands at the midline, facing the examiner. At the signal (movement of the examiner's arm to the left or right), the subject sprints 6.4 meters to the corresponding

sideline as quickly as possible. Each subject performs 10 trials with 20 seconds rest in between.
Scoring: Time is measured to the nearest 1/10 of a second. The final score is the average time across all trials.

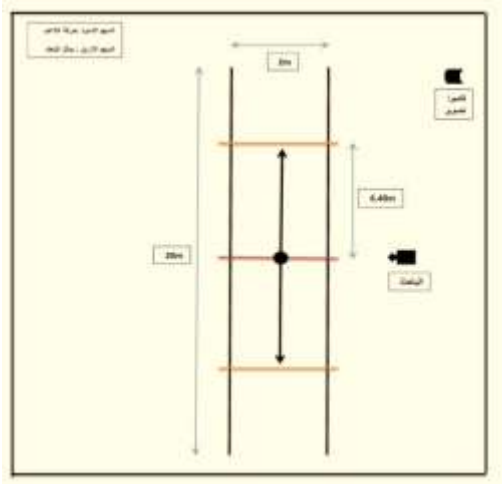

Figure (1) illustrates the motor response speed test

2.4.2 Euro Step Layup Test

Purpose: To assess performance endurance of the Euro Step Layup.
Procedure: The player begins dribbling from midcourt against a defender positioned near the free-throw line. The player must execute a Euro Step Layup to evade the defender and attempt a shot, repeating the process with retrieved balls.
Scoring: Two points for correct execution with a successful shot; one point for correct execution with a missed shot; zero points if unable to evade the defender.
- Equipment and Tools: Basketball court, 2 basketballs, adhesive tape, whistle, stopwatch.
- Performance Description: The player (p) stands at mid-court holding a basketball and begins dribbling towards the basket. A defender is positioned near the free-throw line, defending using a man-to-man defense technique. The player then performs the skill to get past the defender and attempts a shot at the basket. After retrieving the ball, the player repeats the skill and shot under the same defensive conditions and technique, as illustrated in Figure (2).

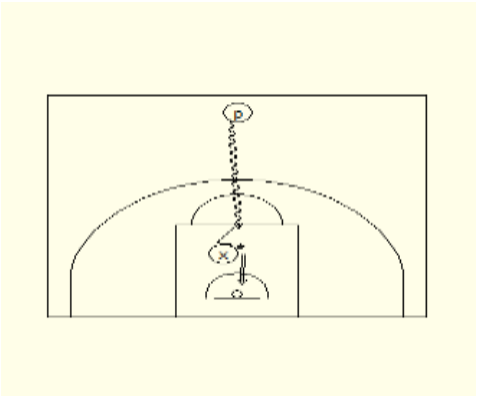

Figure (2) illustrates the Euro Step layup test

- Scoring Method:
- If the player successfully gets past the defender and performs the skill correctly in terms of technical execution, ending with a successful basket, 2 points are awarded.
- If the player successfully gets past the defender and performs the skill correctly in terms of technical execution, but the shot is unsuccessful, 1 point is awarded.
- If the player fails to get past the defender, 0 points are awarded.
- If time expires before the attempt is completed, 1 point is awarded for the skill performed up to that point.

2.4.3 Floater Shoot Test

- Purpose of the Test: To measure the endurance in performing the skill of the "floater shoot."
- Equipment and Tools: Basketball court, 2 basketballs, adhesive tape, whistle, stopwatch.
- Performance Description: From the center of the court, player number (1) performs a feint skill, then receives the ball and drives toward the basket to execute the "floater shoot" skill while a tall defender is present in the restricted area, as illustrated in Figure (3).

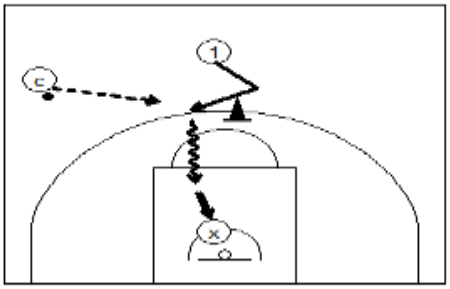

Figure (3) illustrates the floater shoot test.

- Scoring Method:
- If the skill is performed correctly in terms of technical execution, including hand technique and ball flight arc, and the shot is successful, the player is awarded (2) points.
- If the skill is performed correctly in terms of technical execution, including hand technique and ball flight arc, but the shot is unsuccessful, the player is awarded (1) point.
- If the defender manages to block the ball from reaching the basket (block shot), the player receives zero points.

2.5 Pilot Study

A pilot study was conducted on three players on 22 October 2024 at 4:00 PM in Al-Hindiya Indoor Sports Hall. Its purpose was to ensure the scientific validity of the tests, assess the adequacy of the tools, estimate the time required, and evaluate the feasibility of the special exercises within training units.

2.6 Main Experiment

- **Pre-tests:** Conducted on 2 November 2024 at Al-Hindiya Sports Hall with 12 players divided equally into experimental and control groups.
- **Special Exercises:** Implemented between 6 November and 29 December 2024, lasting eight weeks with three sessions per week (Wednesday, Friday, Sunday). Each session included 35–40 minutes of special exercises within the main part of training. High-intensity interval and repetitive methods were employed at 90–100% intensity.

- **Post-tests:** Conducted on 6 January 2025 under the same conditions as the pre-tests.

2.7 Statistical Methods

The following statistical tools were employed:

- Percentages
- Arithmetic mean
- Standard deviation
- Paired-sample *t*-test

3- Presentation, Analysis, and Discussion of Results:

3-1 Presentation of Test Results for Motor Response Speed and the Skills of the Euro Step Layup and Floater Shoot for the Experimental Group:

Table (2) demonstrates the mean values, standard deviations, and the calculated (t) values for the research variables: motor response speed, Euro Step Layup skill, and Floater Shoot skill for the pre-tests and post-tests of the experimental group

Research variables	U. M	Pre-test		Post-Test		T Calculated	significance	Type of significance
		S	A	S	A			
Motor response speed test	Sec.	1.78	0.73	1.63	0.15	3.28	0.000	Moral
Euro Step Layup Test	Deg.	3.10	1.03	11.05	1.40	18.07	0.000	Moral
Floater Shoot Test	Deg	2.26	0.63	12.04	1.42	23.15	0.000	Moral
Under significance level = (0.05) and degree of freedom 5.								

By examining Table (2), which presents the mean values, standard deviations, and calculated (t) values for the research variables (motor response speed, Euro Step Layup skill, and Floater Shoot skill) for the pre-tests and post-tests of the experimental group, it is evident that there are differences between the pre-test and post-test in favor of the post-test. This indicates the statistical significance of these differences. The researcher attributes this improvement to several factors, including the type of specialized exercises used and how they were applied according to the training method in terms of intensity, volume, and density. Additionally, the players' regular attendance and commitment to training were considered. The researcher also integrated cognitive aspects with skill and motor aspects, which is a distinctive feature that links the exercises together by providing the ability alongside the skill in a way that achieves harmony with the player's capacity to reduce unnecessary motor pathways that do not align with the complex performance. The organization of training times and training load techniques were also coordinated with the requirements of basketball players. Thus, the experimental group's program fulfilled the principle of training specificity, as the fundamental basis for developing motor response speed is the repeated skill performance with repeated stimulus-response cycles aimed at shortening motor response time. The objective of the training was for the performance to align with the atmosphere of the match and competition, as the specialized training content and its speed matched the movements performed by the player during the game. This is because a basketball player's movements are characterized by constant changes, considering that in complex skills such as the two skills mentioned above, the player is required

to perform difficult movements with the ball to execute the skill while defenders are present. Therefore, the player must move with strength and speed, changing foot movements to deceive the opposing player, thereby creating a good opportunity to shoot at the basket.

3-1 Presentation of the Results of Motor Response Speed Tests and the (Euro Step Layup) Skill and the (Floater Shoot) Skill for the Control Group:

Table (3) presents the mean values, standard deviations, and the calculated (t) value for the research variables: motor response speed, the (Euro Step Layup) skill, and the (Floater Shoot) skill for the pre-tests and post-tests of the control group

Research variables	U. M	Pre-test		Post-Test		T Calculated	significance	Type of significance
		S	A	S	A			
Motor response speed test	Sec.	1.90	0.85	1.76	0.22	3.19	0.000	Moral
Euro Step Layup Test	Deg.	2.80	0.819	6.80	1.06	12.09	0.000	Moral
Floater Shoot Test	Deg	2.42	0.710	7.58	0.97	15.80	0.000	Moral
Under significance level = (0.05) and degree of freedom 5.								

By reviewing Table (3), which presents the mean values, standard deviations, and the calculated (t) value for the research variables (motor response speed, the (Euro Step Layup) skill, and the (Floater Shoot) skill) for the pre-tests and post-tests of the control group, it is found that there are differences between the pre-test and post-test in favor of the post-test. This indicates the significance of the differences, which the researcher attributes to the training methodology followed by the coach, in addition to the players' commitment and regular attendance at the training sessions.

3-3 Presentation of Results for Motor Response Speed Tests and the Skills of (Euro Step Layup) and (Floater Shoot) for the Experimental and Control Groups:

Table (4) shows the mean values, standard deviations, and the calculated (t) values for the research variables: motor response speed, the skill of (Euro Step Layup), and the skill of (Floater Shoot) for the pre-tests and post-tests of both the experimental and control groups

Research variables	U. M	Pre-test		Post-Test		T Calculated	significance	Type of significance
		S	A	S	A			
Motor response speed test	Sec.	1.63	0.15	1.76	0.22	6.25	0.000	Moral
Euro Step Layup Test	Deg.	11.03	1.40	6.80	1.06	6.005	0.000	Moral
Floater Shoot Test	Deg	12.04	1.42	7.58	0.97	5.837	0.000	Moral
Under significance level = (0.05) and degree of freedom 10.								

3-4 Discussion of Results:

By observing Table (4), the significance of the differences in the post-test results for the researched variables (motor response speed, the skill of (Euro Step Layup), and the skill of (Floater Shoot)) for both the experimental and control groups is evident, favoring the

experimental group. The researcher attributes the significance of the differences in the variable (motor response speed) to the effectiveness of the specialized exercises prepared in the study, which played a positive role in developing the central nervous system's function by enhancing coordination and harmony with external stimuli to perform motor actions. A basketball player requires coordinated movements that demand rapid response speed to make appropriate decisions according to the game situation at multiple and unpredictable times. This, in turn, requires the player to have a high concentration of the central nervous system and rapid motor responses.

The diversity in exercises, as they included multiple stimuli during the training units, had an effective impact on developing motor response speed. This contributed to reducing the motor response time among the players. Motor response speed is one type of speed that every player and athlete should possess. The adaptability of motor response speed is one of the most important physical requirements in basketball due to the sport's characteristic of involving continuous and variable neuromuscular efforts. This is because the player encounters multiple and changing situations and stimuli on the court, which require a rapid motor response from the moment the stimulus appears until the motor response is completed.

Motor response speed is essential for players because they need to quickly adapt to the actions of their opponents. The researcher attributes the improvement in the Euro Step Layup skill and the Floater Shoot skill to the specificity of the special exercises prepared by the researcher, which closely resembled the motor performance and served the objective of the skill to achieve optimal performance. Additionally, the variety in the intensities used had a significant effect on developing these two skills. This resulted from the scientific and precise application of exercises during the training units, taking into account the training volumes to which the players were subjected, in accordance with their training category. This is because the training volumes that players undergo have a significant impact on shaping the players' training condition.

The researcher attributes this development to the training method used, noting that specialized exercises are very beneficial, especially in sports that require jumping strength and speed of performance. These exercises incorporate the full rules of the game and apply them in real playing situations. Specialized exercises represent the core of modern basketball training, as they simulate the real conditions of matches and contribute not only to the development of pure technical skills but also to cognitive aspects, decision-making, and the ability to perform under pressure.

Effectively integrating these exercises into training programs will inevitably lead to comprehensive development of various skills, contributing to building players who are more efficient and effective on the court. Mastery of individual and combined skills is fundamentally essential for advancement and excellence, whether in training units, skill tests, or actual competition. The goal of training is to ensure performance aligns with the atmosphere of the match and competition.

This is precisely what the researcher aimed for in this study by using specialized exercises that include multiple stimuli to improve and develop these two skills through enhancing neural capabilities that improve coordination between the hand, eye, and foot, speed of decision-making, muscle control, as well as balance and body control. Basketball players face multiple

conditions during competition, which requires quick anticipation, rapid decision-making, and fast motor response to the actions of the opposing player during the course of the game.

4. Conclusions and Recommendations

4.1 Conclusions

1. The special exercises were effective in developing motor response speed.
2. The exercises significantly enhanced the Euro Step Layup and Floater Shoot skills.
3. Statistically significant improvements were recorded in favor of the experimental group across all tested skills.

4.2 Recommendations

1. Adopt special exercises in training sessions, as they combine engagement with skill and tactical development.
2. Prioritize training of motor response speed as a prerequisite for offensive success in basketball.
3. Emphasize compound drills that replicate match-like scenarios.
4. Employ modern training aids to further improve response speed and offensive execution.

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