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# Impact of a Motor Learning-Based Training Program on Selected Physical Qualities and Jump-Shot Accuracy Among Beginner Players in the Olympic Champion Project

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**Abstract**

This study examined the effect of a training program designed according to motor learning principles on selected physical qualities and jump-shot accuracy among beginner players of the Olympic Champion Project. A one-group pretest-posttest experimental design was used. The research population consisted of 30 beginner players; 20 players were randomly selected as the main sample (66.66%), and 6 players were included in a pilot sample (13.33%). The program was implemented for 8 weeks with three training units per week, with 45-50 minutes per unit. Outcome measures included muscular strength (60-second repetitions), 30-m sprint speed, agility (zigzag run), and jump-shot accuracy (10 attempts, best 8 scored). Paired-sample t-tests showed significant improvements from pretest to posttest in muscular strength (t=5.13; p=0.00), 30-m speed (t=4.44; p=0.00), agility (t=3.88; p=0.00), and shooting accuracy (t=9.14; p=0.00). The findings indicate that a motor learning-based training program can improve physical qualities and jump-shot accuracy among beginner players.

**Keywords:** Motor learning, Training program, Physical qualities, Jump-shot accuracy, Beginner players.

## Introduction

Physical and skill abilities form the core foundation for beginner athletes, particularly when they are developed within structured training pathways such as the Olympic Champion Project. At the early stage of athlete development, improvements in basic physical qualities—such as muscular strength, speed, and agility—are closely linked to the effectiveness of technical learning, because these qualities support movement efficiency, coordination, and the capacity to perform sport-specific skills under varying task demands. In many youth development programs, however, technical practice is often carried out in repetitive ways without sufficient progression, feedback quality, or systematic task organization. As a result, beginners may struggle to build

stable movement patterns, make slower improvements, and show inconsistent performance when the task becomes more complex, such as performing jump shots under time pressure or after changes in direction.

In response to these challenges, motor learning principles provide a strong pedagogical framework to improve both physical and skill outcomes. Motor learning emphasizes structured and progressive practice, the careful manipulation of task difficulty, and the use of feedback to guide learners toward more accurate and efficient movement solutions. Through well-planned progression—from simple to more complex tasks—beginners can gradually refine coordination, timing, and body control while simultaneously developing the physical qualities required to execute skills effectively. For jump-shot performance, for example, learners must coordinate lower-limb force production, trunk stability, arm action, and release timing; therefore, training that integrates motor learning concepts may accelerate improvement by strengthening both the physical basis and the accuracy of the motor pattern.

Therefore, this study aimed to estimate the effect of a training program based on motor learning principles on developing selected physical qualities and jump-shot accuracy among beginner players in the Olympic Champion Project. The main research problem guiding this work was whether a motor learning–based program meaningfully contributes to improving key physical and skill abilities in this beginner population. To address this problem, the study set out three objectives: (1) to design a structured training program grounded in motor learning principles; (2) to measure the effect of the program on muscular strength, 30-m sprint speed, and agility as essential physical qualities that support sport performance; and (3) to determine the effect of the program on jump-shot accuracy as a critical technical outcome. Based on the theoretical and practical advantages of progressive practice and feedback in motor learning, the study hypothesized that there would be statistically significant differences between pretest and posttest results across physical and skill variables, with improvements expected in favor of the posttest. This hypothesis reflects the expectation that a motor learning–based training approach can produce measurable gains in both physical qualities and technical accuracy among beginner athletes within structured development programs.

## 2. Methods

### Design and participants:

A single-group experimental design (pretest-posttest) was applied. The research population consisted of 30 beginner players from the Olympic Champion Project in Dhi Qar Governorate. The main sample included 20 players selected randomly (66.66%). A pilot sample of 6 players (13.33%) was also selected; four players who did not attend the test were excluded.

### Setting and timeframe:

The study was conducted in the Olympic Champion Project Hall, Dhi Qar Governorate, from 10/8/2025 to 15/12/2025.

**Measurements and tests:**

- Muscular strength test (60 seconds): Maximum correct repetitions of push-ups from knees (for females) or from toes (for males) or squat repetitions within 60 seconds; total correct repetitions recorded.

- 30-m sprint speed: Standing start; time measured using an electronic stopwatch (manual timing acceptable to 0.01 second).

- Agility (zigzag run): Five cones placed 3 meters apart; the player runs in a zigzag pattern out and back; total time recorded in seconds.

- Jump-shot accuracy: A target is drawn on a wall divided into scoring areas (1-10 points). The player stands 7 meters away and performs 10 jump shots. The best 8 attempts are summed (highest and lowest scores removed).

**Training program:**

The training program was designed based on motor learning principles with gradual task progression from easy to difficult. The program lasted 8 weeks, with 3 training units per week. Each unit lasted 45-50 minutes and included: (1) warm-up (10 minutes), (2) main part (30-35 minutes), and (3) cool-down (5 minutes). The main part included timing drills, movement sequences, progressive shooting tasks, rhythm and balance exercises, and applied skill practice.

**Validity and reliability:**

Content validity was confirmed through expert arbitration. Test-retest reliability ranged from 0.82 to 0.91.

**Data analysis:**

Descriptive statistics (mean and standard deviation) were calculated. Paired-sample t-tests were used to compare pretest and posttest results.

## 3. Results

**Table 1. Pretest-posttest results for physical and skill variables (n=20)**

| Variable | Pretest Mean | Pretest SD | Posttest Mean | Posttest SD | t | p |
|---|---|---|---|---|---|---|
| Muscular strength (reps) | 5.10 | 0.88 | 6.20 | 0.77 | 5.13 | 0.00 |
| 30-m sprint (s) | 6.10 | 0.44 | 6.80 | 0.39 | 4.44 | 0.00 |
| Agility zigzag (s) | 16.20 | 1.40 | 15.10 | 1.00 | 3.88 | 0.00 |
| Jump-shot accuracy (points) | 11.15 | 2.14 | 16.40 | 1.99 | 9.14 | 0.00 |

## 4. Discussion

The results demonstrate significant improvements in muscular strength, speed, agility, and jump-shot accuracy after the implementation of the motor learning-based training program. The improvement in muscular strength may be related to the gradual progression and repeated execution of exercises that enhanced neuromuscular activation. Similarly, improvements in skill accuracy may be explained by organizing learning tasks from easy to difficult and providing repeated practice under progressively more complex conditions. These findings support the use of motor learning principles in developing both physical qualities and skill performance among beginner players.

## 5. Conclusion

1. The motor learning-based program positively improved selected physical qualities among beginner players.
2. The program improved the acquisition of motor skills, particularly jump-shot accuracy.
3. The proposed program appears more effective than traditional approaches for beginner development.

## 6. Recommendations

1. Integrate motor learning-based programs into sport education and training curricula.
2. Provide training for teachers/coaches on building training programs based on motor learning principles.
3. Conduct future studies on different skills and sports, including comparisons with other approaches such as cooperative learning or flipped education.
4. Utilize technology (e.g., slow-motion video and motion analysis) to support motor learning and performance feedback.

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