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## Research Paper

## The Effect of Using Exercises Based on Marzano Model on Motor Speed and Learning the Handspring on Vault Skill Among Students

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### ABSTRACT

This research aims to explore the effect of exercises based on the Marzano model in improving the motor speed of the arms and learning the handspring on vault skill among second-year students at the College of Physical Education, University of Kufa. The study was conducted on two groups: one experimental and the other control. The results showed the superiority of the experimental group, indicating the effectiveness of the Marzano model in enhancing motor learning and skill performance.

**Conclusion:** Integrating strategic thinking into physical exercises shows a significant impact on accelerating the acquisition of complex motor skills.

**Recommendation:** It is recommended to adopt the Marzano model as a training tool in practical curricula to enhance the effectiveness of learning motor skills in physical education classes.

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**KEYWORDS:** Marzano model, handspring on vault.

### 1. INTRODUCTION

The scientific progress we are witnessing today in various fields is the result of experiences, experiments, and research that have led to multiple conclusions serving humanity. This development has positively impacted physical education and sports sciences, opening new horizons for researchers and students in gymnastics to explore and develop the latest skills and abilities. To achieve the best results, it is essential to adopt new and innovative methods in sports sciences, which must be considered in planning the educational and training process. The educational process is based on the main goal of transferring knowledge effectively from teacher to student. A good teacher is one who diversifies teaching methods and introduces new content,

helping reduce student boredom. Using a uniform teaching method for all students may negatively affect their learning, as students are significantly influenced by the teacher's approach.

The Marzano model is a modern and effective teaching model. It is expected to be an effective tool for linking different educational research fields. Understanding each individual's sensory system helps teach skills more accurately. Researchers have pointed to the dimensions of thinking, which resulted from Marzano's studies in the twentieth century. One of the advantages of these educational models is the ability to plan educational units with experiences provided by teachers, creating an effective learning environment where both teacher

and student participate in achieving educational goals. This model allows universities to organize lessons according to five learning dimensions, making it applicable in physical education and various sports skills.

Gymnastics is one of the artistic sports that requires high physical and psychological skills. It is part of the physical education curriculum. Most teachers use the simple methods available at the college. With increasing class sizes, teachers face difficulty monitoring each student's performance, leading to individual differences.

The importance of this research lies in introducing a modern teaching strategy (Marzano model) into the practical side of gymnastics classes, which may contribute to developing skill performance and improving arm motor speed, thereby enhancing learning efficiency.

**Research Problem** The handspring on vault is a fundamental gymnastics skill requiring precise physical and motor elements such as arm motor speed and neuromuscular coordination. However, student performance observations reveal noticeable weaknesses in movement speed and mastery, reflecting inadequacies in current teaching methods that rely on rote learning without considering individual differences.

This necessitates the introduction of modern educational models like the Marzano model, which combines mental and motor skills and relies on strategic thinking. Thus, the research problem is defined as: What is the effect of exercises based on the Marzano model on arm motor speed and learning the handspring on vault skill among second-year students at the College of Physical Education?

## 2. RESEARCH OBJECTIVES

1. Preparing educational exercises based on the Marzano model to develop arm motor speed and learn the handspring on vault skill.

**Table 1:** Sample homogeneity in height, body mass, and age

| Variables         | Unit  | Mean   | Median | Std. Deviation | Skewness | Result      |
|-------------------|-------|--------|--------|----------------|----------|-------------|
| Height            | cm    | 179.65 | 175    | 3.932          | 0.258    | Homogeneous |
| Body Mass         | kg    | 74.65  | 74.6   | 3.198          | 0.589    | Homogeneous |
| Chronological Age | years | 19.6   | 19     | 1.147          | 0.466    | Homogeneous |

### Tools, Devices, and Instruments Used Data Collection Tools

- Arabic and foreign references.
- Personal interviews.
- Tests and measurements.
- Special forms to record student test results.

### Devices and Equipment

- Electronic calculator (laptop).
- Electronic stopwatch.
- Plastic markers (12).
- Mat.
- Vault platform.
- Whistle.
- Adhesive tape.
- Test result recording forms.

2. Identifying the effect of Marzano-based exercises on developing arm motor speed.
3. Determining the effectiveness of the model in improving learning the handspring on vault skill compared to traditional methods.

**Research Hypothesis:** There is a positive effect of educational exercises based on the Marzano model on arm motor speed and learning the handspring on vault skill among students.

### Research Fields

**Human field:** Second-year students at the College of Physical Education – University of Kufa.

**Time field:** From 5/1/2025 to 16/2/2025.

**Place field:** Gymnastics Hall at the college.

## 3. RESEARCH METHODOLOGY

**Field Procedures:** Selecting a suitable method is essential. The research method is defined as "the intellectual organization or steps the researcher follows to solve a specific problem" (Nouri, 2004, p. 51). Based on this, the researcher used the experimental method with two equivalent groups due to its suitability.

**Research Population and Sample:** The research sample consisted of 72 second-year students at the College of Physical Education and Sports Sciences, University of Kufa. A sample of 20 students was randomly selected and divided into two groups: control (10 students, taught with the teacher's method) and experimental (10 students, taught using Marzano-based exercises). Four additional students were used for pilot studies.

**Sample Homogeneity** To ensure design requirements and control variables, the researcher checked sample homogeneity in height, weight, and age using the skewness coefficient before the main experiment.

### Field Procedures Description of Tests

1. Motor Speed Test (Mohammad Hassan, 1994, p. 282):
  - **Test Name:** Side steps.
  - **Test Goal:** Measure the player's speed in side movement.
  - **Tools:** Measuring tape and stopwatch.
  - **Procedure:** Prepare a suitable area with five parallel lines, each 90 cm apart. The subject stands on the middle line and moves side to side upon signal.
  - **Scoring:** One point is awarded each time the subject touches a sideline in 10 seconds.
2. Hands-on Vault Test
  - Goal: Evaluate the takeoff technique in the handspring on vault skill in men's artistic gymnastics.

- **Tools:** Vault platform, mats, camera (1), tripod, numbered cards, whistle.
- **Procedure:** The subject starts from the beginning line, runs toward the vault platform to perform the handspring. Each student gets two attempts the better one is scored.
- **Scoring:** The performance is evaluated by three gymnastics experts. The final score is the average of the three scores, with a maximum of 10.

**Pilot Study** The pilot study was conducted to obtain objective results for the tests (motor speed and handspring skill) on Tuesday, 7/1/2025, with a sample of 4 students from the research population.

Pre-tests for the experimental group were conducted on Thursday, 9/1/2025, in the indoor gym, covering (motor speed and handspring on vault).

**Main Experiment** The educational curriculum based on the Marzano model was implemented over six weeks with two sessions per week (45 minutes each). The experimental program was applied from 12/1/2025 to 28/2/2025, while the control group followed the traditional program during the same period.

Post-tests were conducted on Sunday, 2/3/2025, at 9:00 a.m. in the gymnastics hall for both groups, under the same conditions and procedures as the pre-tests.

**Statistical Tools** The researcher used the SPSS statistical package to analyze the research results.

### Presentation and Discussion of Pre and Post-Test Results for the Control Group

**Table 2:** Comparison of pre- and post-test results for the control group

| Variables           | Unit  | Pre-test Mean $\pm$ SD | Post-test Mean $\pm$ SD | t-value | Sig. Level | Significance |
|---------------------|-------|------------------------|-------------------------|---------|------------|--------------|
| Motor Speed         | Count | 5.63 $\pm$ 0.991       | 7.22 $\pm$ 1.321        | 3.054   | 0.006      | Significant  |
| Handspring on Vault | Score | 3.64 $\pm$ 0.996       | 5.45 $\pm$ 0.898        | 3.221   | 0.002      | Significant  |

These results indicate significant differences between the pre- and post-tests for the control group in both motor speed and handspring on vault skill in favor of the post-test. The researcher attributes this improvement to the effect of the traditional

educational program prepared by the instructor, and the students' commitment and continuity in learning.

### Presentation and Discussion of Pre and Post-Test Results for the Experimental Group

**Table 3:** Comparison of pre- and post-test results for the experimental group

| Variables           | Unit  | Pre-test Mean $\pm$ SD | Post-test Mean $\pm$ SD | t-value | Sig. Level | Significance |
|---------------------|-------|------------------------|-------------------------|---------|------------|--------------|
| Motor Speed         | Count | 5.82 $\pm$ 0.966       | 8.86 $\pm$ 0.954        | 4.034   | 0.001      | Significant  |
| Handspring on Vault | Score | 3.22 $\pm$ 0.966       | 7.19 $\pm$ 0.922        | 6.162   | 0.000      | Significant  |

The results in Table 3 show statistically significant differences in favor of the post-test for the experimental group. The researcher attributes this progress to the application of the educational program based on the Marzano model.

### Presentation and Discussion of Post-Test Results Between the Control and Experimental Groups

**Table 4:** Comparison of post-test results between the control and experimental groups

| Variables           | Unit  | Control Post-test Mean $\pm$ SD | Experimental Post-test Mean $\pm$ SD | t-value | Sig. Level | Significance |
|---------------------|-------|---------------------------------|--------------------------------------|---------|------------|--------------|
| Motor Speed         | Score | 7.22 $\pm$ 1.321                | 8.86 $\pm$ 0.954                     | 3.034   | 0.000      | Significant  |
| Handspring on Vault | Score | 5.45 $\pm$ 0.898                | 7.19 $\pm$ 0.922                     | 4.113   | 0.000      | Significant  |

The results confirm the effectiveness of the Marzano-based exercises. Students in the experimental group showed superior improvement compared to the control group.

## 4. RESULTS

Table 2 shows statistically significant improvements in the control group in both tested variables due to the conventional educational program. According to Saad Mohsen (1996), any educational program built on scientific foundations contributes to performance development through proper programming, intensity, repetition, and individualized consideration under expert supervision. Table 3 confirms greater development in the experimental group. This improvement is attributed to the Marzano model's strategic structure, which includes active learning and cognitive involvement. According to Amal Hussein

(2018), such models enhance student interaction, engagement, and skill acquisition. Hassanein (2015), citing other scholars, notes that effective learner participation requires constant interaction and choice, which are inherent in Marzano-based programs.

## 5. CONCLUSIONS

1. Exercises based on the Marzano model contributed positively to evaluating and learning the handspring on vault skill.
2. The exercises had a clear positive effect on improving motor performance and speed.
3. The experimental group that used the Marzano model outperformed the control group that used traditional methods.

## 6. RECOMMENDATIONS

1. Adopt the Marzano model-based exercises for their effectiveness in learning and evaluating the handspring on vault skill.
2. Encourage further studies using innovative learner-centered teaching strategies for motor skill education.
3. Conduct similar studies on other samples and compare results with the current research.

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