The Effect of the Cube Strategy on Learning the Skills of Passing and Shooting in Football for Students

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Abstract

The significance of this research lies in its attempt to employ a modern strategy, the "Cube Strategy," which the researchers believe has a positive impact on learning certain fundamental football skills for students, including passing and shooting. It also contributes to saving time and effort.

The research aimed to identify the effect of the Cube Strategy on learning the skills of passing and shooting in football for students. The study sample consisted of fifth-grade preparatory students from Al-Jumhuriya Preparatory School for Boys in Dhi Qar Governorate for the academic year 2024–2025. The researchers utilized the experimental method, employing a design of two equivalent groups: an experimental group and a control group.

The most significant conclusion was the superiority of the experimental group, which applied the Cube Strategy, over the control group, which followed the traditional method, in learning the skills of passing and shooting in football for students.

1. Introduction to the Research

1.1 Introduction and Importance of the Research:

The tremendous scientific revolution witnessed by the world during the early years of the 21st century has brought significant advancements to all fields of science and knowledge. The field of sports is one such area that encompasses diverse sciences and knowledge. Teaching methods are among the sciences that have seen substantial development, utilizing various other disciplines, modern strategies, and approaches to foster positive societal change. This development stems from the accumulation of experiences, research, and studies conducted by numerous scholars and researchers in teaching methods and motor learning, all aimed at enhancing learners' motor skills in ways that serve the physical and motor pathways of sports activities.

Modern strategies in learning have emerged, including the **Cube Strategy**, one of the innovative approaches designed to enhance learners' thinking abilities, assess their readiness for learning, and leverage their prior knowledge and experiences. The Cube Strategy is a modern teaching method based on the cognitive organization of content. It is a visual technique that helps students organize scientific information by examining a scientific phenomenon or subject from six perspectives representing the faces of a cube: description, comparison, connection, analysis, application, and evidence. In this approach, the teacher outlines the main points under each face of the cube, and students develop their ideas beneath each of the six faces.

Football is an activity that comprises several fundamental skills, which teachers are required to instruct and effectively convey to learners. This development process aims to enhance learners'

performance skills through the use of appropriate and effective strategies and methods that align with their nature, interests, and preferences, ultimately achieving high levels of proficiency and efficiency. To elevate these skills and improve the game to its best potential performance level, educators must seek alternative teaching methods tailored to football's diverse skills and the learners' developmental stages.

This research derives its significance from being a scientific endeavor to utilize a modern strategy—the **Cube Strategy**. The researchers believe this strategy positively impacts and accelerates the learning process for some fundamental football skills, particularly passing and shooting.

1.2 Research Problem

Through the researchers' work and observation of most physical education lessons in some schools in the governorate, they noticed a weakness among students in the fundamental skills of football. They also observed that the classroom environment in most schools is unmotivating and lacks stimulation for critical thinking. Additionally, the development of fundamental football skills, particularly passing and shooting, does not align with the rapid progress the game has experienced.

This may be due to the lack of strategies suitable for the large number of learners, which increases the burden on teachers in terms of monitoring each student and correcting the errors associated with their skill performance. The reliance of teachers on strategies and teaching methods that are teacher-centered, reducing the role of learners to passive recipients of information, and the absence of active interaction between learners and teachers are likely reasons behind the decline in learning levels among most students.

Thus, it has become necessary to search for teaching strategies and methods based on scientific principles to achieve the desired educational objectives. Such strategies should activate the learners' role and their positive self-effort in facing and addressing problems they may encounter. Consequently, this would enhance the students' football skills. This necessity motivated the researchers to employ the **Cube Strategy** and examine its impact on learning the football skills of passing and shooting, hoping to bring about positive change and provide a modest scientific contribution, given the scarcity of research addressing these topics.

1.3 Research Objectives:

1. To identify the impact of the Cube Strategy on learning the football skills of passing and shooting for students.
2. To determine the superiority between the control and experimental groups in the post-test results for learning the football skills of passing and shooting for students.

1.4 Research Hypotheses:

1. The Cube Strategy has a positive impact on learning the football skills of passing and shooting for students.
2. The experimental group, which implemented the Cube Strategy, will show superiority in the post-test results for learning the football skills of passing and shooting for students.

1.5 Research Fields:

1.5.1 Human Field:
Fifth-grade high school students at Al-Jumhuriya Preparatory School for Boys, Nasiriyah District, Dhi Qar Governorate, for the academic year 2024–2025.

1.5.2 Time Field:
From December 8, 2024, to February 16, 2025.

1.5.3 Spatial Field:
The sports field at Al-Jumhuriya Preparatory School for Boys.

1.6 Definition of Terms

1.6.1 Cube Strategy:
A strategy or visual method that helps learners organize scientific information about a single scientific phenomenon by examining it from six perspectives, corresponding to the six faces of a cube (496:3).

2. Research Methodology and Field Procedures

2.1 Research Methodology:
The researchers used the experimental method with a design of two equivalent groups (control and experimental), as it suits the nature and objectives of this study.

2.2 Research Population and Sample:
The research population was defined as fifth-grade high school students at Al-Jumhuriya Preparatory School for Boys, Dhi Qar Governorate, for the academic year 2024–2025. The total population consisted of 98 students distributed across three sections (A, B, C).

After ensuring homogeneity and equivalence, the researchers conducted their field experiment on a sample of 32 students representing sections A and B, with 16 students from each section. The sample constituted 32.65% of the total population. Using a random lottery method, section A was selected as the experimental group to implement the Cube Strategy, while section B served as the control group, employing the method traditionally used by the subject teacher. Section C was used for a pilot study.

The researchers excluded students who had failed, suffered from physical disabilities, or actively played football. They ensured the sample's homogeneity and equivalence using the coefficient of variation and the **t-test** for independent samples. Tables (1 , 2) illustrate these results.

The table (1)

The table shows the means, standard deviations, and coefficients of variation for **age**, **height**, and **mass**.

Treatments Variables	Unit of Measurement	Mean (X̄	Standard Deviation (SD	Coefficient of Variation (CV%)**
Age	Month	**190.082**	**3.913**	**2.058**
Height	cm	**174.791**	**5.442**	**3.113**
Mass	kg	**66.273**	**5.227**	**7.887**

All coefficient of variation values were below 30%, indicating the homogeneity of the sample in the variables mentioned above.

The table (2)

The table shows the equivalence of the two research groups in the football skills of passing and shooting.

Treatments Variables		Control Group		Experimental Group		Calculated t-value	Significance Level	**Statistical Significance** |
		(سَ)	(ع∓)	(سَ)	(ع∓)			
Passing	Score	**11.166**	**1.898**	**11.416**	**2.466**	**0.278**	**0.783**	Non-Significant
Shooting	Score	**9.750**	**3.306**	**10.166**	**2.249**	**0.361**	**0.722**	Non-Significant

Significant at a significance level of < (0.05) with 30 degrees of freedom.

It is evident from Table (2) that the calculated value of (t) for all research variables is at a significance level greater than (0.05), indicating the presence of non-significant differences. This means that the two groups are equivalent in the research variables.

2-3 Methods of Data Collection:

2-3-1 Data Collection Methods:

- Arabic and foreign sources
- The Internet
- Tests and measurements
- Questionnaires

2-3-2 Tools and Devices Used:

- A laptop (DELL)
- Measuring tape
- Medical scale
- Whistle
- Electronic stopwatch
- Footballs
- Colored tape
- Markers

2-4 Identifying Basic Football Skills and Selecting Tests for Each Skill Under Study:

The basic football skills included in the study were determined according to the curriculum specified by the Directorate of School Sports Activities in Dhi Qar Governorate for the academic year 2024-2025. The identified basic skills are **passing** and **shooting**. The research required conducting tests for each skill under study, which were chosen by leveraging previous literature. These tests were reviewed and approved by a panel of experts, achieving a 100% approval rate, thus ensuring the **face validity** of the tests.

Although the tests have been previously used in Arab and Iraqi contexts with established and reliable scientific metrics, the researchers conducted a pilot study on a sample different from the study sample but from the same population. This sample consisted of 12 students from Class (A) to verify the reliability of the tests by applying and reapplying them. The researchers also ensured objectivity by assigning two referees to record the test scores and then calculating the correlation coefficient between their scores. The high correlation coefficients confirmed the reliability and objectivity of the tests, as demonstrated in Table (3).

Table (3) shows the reliability and objectivity coefficients.

seq	Test Name	Reliability	Objectivity
1	Accuracy test for passing towards three circles drawn on the ground at a distance of 20 meters	0.87	0.97
2	Accuracy shooting test towards a divided goal	0.82	0.95

2-5 Test Specifications:

2-5-1 Passing Skill Test:

Test Name: Accuracy test for passing towards three circles drawn on the ground at a distance of 20 meters (213:2).

Purpose: To measure the accuracy of medium-range passing.

Required Tools: Designated test area, five balls, measuring tape, and cones.

Procedure:

Three overlapping circles are drawn with diameters of 2m, 4m, and 6m, assigned scores of 6, 4, and 2 points, respectively.

The center of the circles is 20 meters away from the starting line.

Scoring:

The player is given five consecutive attempts.

The total score from the five attempts is recorded.

The maximum score a player can achieve is 30 points.

General Guidelines:

An attempt is considered invalid if the ball falls outside the circles.

If the ball lands on a circle's line, the score for the next lower circle is assigned (5, 3, or 1 point, depending on the circle).

2-5-2 Shooting Skill Test:

Test Name: Accuracy shooting towards a divided goal (80:1).

Purpose: To measure shooting accuracy at the goal.

Required Tools: Six footballs, tape to mark the shooting area, a football goal, and a football field.

Procedure:

Six footballs are placed along the penalty area line (18 yards from the goal), spaced 1m apart.

The player stands behind ball #1 and, upon a start signal, shoots the balls sequentially at the marked target areas on the goal, following the indicated importance and difficulty levels.

Shooting begins with ball #1 and ends with ball #6, using the instep of the foot.

A shot is invalid if none of the three target areas, including the central goal, are hit.

Scoring:

Points are awarded as follows:

4 points for hitting target zone 4.

3 points for hitting target zone 3.

2 points for hitting target zone 2.

1 point for hitting target zone 1.

0 points for a failed shot.

Each participant is allowed one trial comprising six shots.

The maximum achievable score is 24 points.

2-6 Field Research Procedures:

2-6-1 Pre-tests:

The pre-tests were conducted on the main research sample on Wednesday, December 18, 2024, at the Republic High School for Boys field, in the presence of the subject teacher and the research team.

2-6-2 Main Experiment:

After determining all the requirements for the main experiment, including identifying the skill tests and conducting a pilot study to organize and prepare for the main experiment, the researchers provided an introductory instructional unit to the experimental and control groups. This aimed to give prior instruction to familiarize students with the nature of the skill to be learned and to align the educational objectives with the teaching strategy.

Duration:

The main experiment began on Wednesday, December 25, 2024, and ended on Monday, January 27, 2025.

The educational program consisted of 10 instructional units, with two sessions per week, each lasting 45 minutes.

Structure of the Instructional Unit for the Experimental Group:

Preparatory Section (10 minutes):

Introduction, physical exercises, and warm-up for the muscle groups involved in performance.

Main Section (30 minutes):

Educational Aspect (10 minutes):

Skill explanation and demonstration by the teacher.

Application of the cube strategy by dividing students into four cooperative groups.

The cube is rotated manually, stopping to present a face with a question related to one of the following steps: description, analysis, comparison, or connection.

Students read the question, discuss it within their group, and provide an answer. Other groups evaluate the response, followed by teacher feedback.

Practical Aspect (20 minutes):

Focuses on the fifth face of the cube: application.

Groups perform targeted exercises collaboratively to learn the specific skill.

Concluding Section (5 minutes):

Students address the sixth cube face: proof, where they share insights on the skill's benefit.

Relaxation exercises or a small game conclude the session.

2-6-3 Post-tests:

The post-tests were conducted on Tuesday, January 28, 2025. The researchers ensured that the conditions were similar to those of the pre-tests in terms of location, time, and the presence of the assisting team, with direct supervision by the researcher. The same steps used in the pre-tests were followed.

2-7 Statistical Methods:

The researchers used the **SPSS** statistical program to extract the results according to the following statistical measures:

- Arithmetic mean
- Standard deviation
- Coefficient of variation
- **t-test** for paired samples
- **t-test** for independent samples

3. Results Presentation, Analysis, and Discussion

3-1 Presentation and Analysis of Results for the Experimental and Control Groups:

Table (4) shows the arithmetic means, standard deviations, and calculated **t**-values for the pre-tests and post-tests of the two groups.

Group	Treatments Variables	Pre-tests		Post-tests		Calculated (t) Value	Significance Level	Statistical Significance
		سَ	(ع±)	سَ	(ع±)			
Experimental	Passing (Score)	**11.416**	**2.466**	**22.416**	**2.678**	**11.171**	**0.000**	Significant
	Shooting (Score)	**10.166**	**2.249**	**18.250**	**2.632**	**11.899**	**0.000**	Significant
Control	Passing (Score)	**11.166**	**1.898**	**17.583**	**2.810**	**7.567**	**0.000**	Significant
	Shooting (Score)	**9.750**	**3.306**	**14.583**	**3.528**	**6.959**	**0.000**	Significant

Significant at a significance level of < (0.05) and with a degree of freedom (19).

Table (4) presents the arithmetic means, standard deviations, and calculated **t**-values for the pre-test and post-test results in the passing and shooting skills in football for the experimental and control groups. The results in the table show that the calculated significance levels for both groups are less than the significance threshold of (0.05). This indicates the presence of statistically significant differences between the pre-test and post-test results, in favor of the post-test results for both groups.

3-2 Presentation and Analysis of Post-Test Results for the Experimental and Control Groups:

Table (5) shows the arithmetic means, standard deviations, and calculated **t**-values for the post-test results of the experimental and control groups

Treatments / Skills	Experimental Group		Control Group		Calculated t-value	Significance Level	Statistical Significance
	سَ	∓)ع(	سَ	∓)ع(			
passing (Score)	**22.416**	**2.678**	**17.583**	**2.810**	**4.312**	**0.000**	Significant
Shooting (Score)	**18.250**	**2.632**	**14.583**	**3.528**	**2.889**	**0.009**	Significant

.Significant at a significance level of < (0.05) with 30 degrees of freedom.

Table (5) shows the arithmetic means, standard deviations, and calculated **t**-values for the post-test results in passing and shooting skills in football for the experimental and control groups. The results indicate that the calculated significance level in the skill tests is lower than the significance threshold of (0.05), which reflects statistically significant differences in favor of the experimental group.

3-3 Discussion of Results

Table (4) demonstrates the development of both the experimental and control groups in learning passing and shooting skills in football. The researchers attribute this improvement and the observed differences between the two groups to several factors:

- Repeated attempts tailored to the students' abilities and skill levels.
- The time allocated for implementing the educational curriculum, which contributed to the development observed in both groups.
- The well-designed curriculum, featuring scientifically selected and properly repeated exercises aligned with the students' capabilities, based on correct practice.

Training and consistent practice in a specific skill under a physical task lead to increased experience and improved skill performance. Practice is the most critical variable in learning complex and even simple skills. As noted by **Schmidt (1992)**, every learned skill has a motor program stored in the brain, which becomes refined with repeated performance until achieving acceptable performance. Feedback ensures the alignment between the stored motor program and the executed movement.

Table (5) highlights the superiority of the experimental group over the control group in passing and shooting skills. The researchers credit this to the effectiveness of the **Cube Strategy**, implemented in the experimental group. The educational units based on this strategy enhanced students' self-confidence, reduced their isolation and fear of participation, and increased their motivation. This cooperative learning method encouraged participation, a love for the subject, and a drive toward correct performance. **Fouad Suleiman** noted that clear and well-defined objectives in behavioral or performance-level terms are effective and meaningful.

Key factors in the success of the Cube Strategy include:

- Cooperative learning and task distribution among students.
- Capturing students' attention and employing teaching aids to support learning.
- Gradual support tailored to students' abilities and needs, building their self-confidence and sense of responsibility.

The Cube Strategy also created an engaging learning environment characterized by excitement, positive interaction, and increased motivation toward achieving better results. It facilitated continuous and effective communication between the teacher and students and among peers, positively impacting skill performance. Through this communication, the teacher could address students' diverse needs and find appropriate solutions to achieve learning goals.

4. Conclusions and Recommendations

4-1 Conclusions

1. The Cube Strategy and the traditional method had a positive impact on learning passing and shooting skills in football.
2. The experimental group, which used the Cube Strategy, outperformed the control group, which used the traditional method, in learning passing and shooting skills.
3. Learning through the Cube Strategy captured students' attention, increased their motivation, and fostered their enthusiasm for learning.

4-2 Recommendations

1. Adopting the Cube Strategy in teaching passing and shooting skills in football.
2. Considering individual differences among learners to select appropriate teaching strategies and models to enhance learning outcomes and improve skill performance.
3. Encouraging further research on the Cube Strategy, applying it to other team or individual sports.

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