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# Designing and rationing a shooting fly test from inside the penalty area for football players aged (16-17) years

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**Abstract**
The purpose of this paper is to designing and rationing a test for shooting on the fly from inside the penalty area for young football players. The descriptive approach was used to suit the nature of the problem. The research community included players from the National Centers for Sports Talent Care in football in Baghdad, who numbered (120) players, and (100) players were selected from them as a research sample. Thus, the percentage of the sample from the original population was (83.33). After using appropriate statistical methods, the researcher reached the most important conclusions, which is converting the raw scores into standard scores and placing them in tables so that coaches can refer to them when evaluating the level of players as a standard prepared for comparison with the level. As for the most important recommendations, they are represented by relying on the grades and standard levels reached by the researchers as a means of objective evaluation.

**Keywords:** Test design, shooting on the fly, penalty area

## Introduction

Our current time is witnessing a great and unprecedented development in various fields of life, and this development has included all facilities and opened doors to many fields, including the sports field, because of its great importance to many practitioners, followers and amateurs in performing various sports activities and games, whether group or individual, and football. Football is one of these games, it is the most practiced, followed, and popular due to the fun it provides to its fans.

Testing and measurement is one of the sciences that has a great impact on the game of football because it provides real results regarding the different levels of players for all age groups and various aspects, especially the skill ones, as well as helping coaches in revealing the multiple skill capabilities of the team players, and the shooting skill is one of the most important of these skills. Because of its effective role in deciding the results of the match and achieving the largest possible number of goals, this is why we must focus on this skill and the way it is performed in different forms and from various places, (Rashid, Ahmed, & Raheem, 2022) [9].

The importance of the study lies in designing and rationing a test for the skill of shooting on the bird from inside the penalty area because of its great importance in making the difference between the results of the two teams during the course of the match.

## Research problem

The game of football continues to develop, and this development is the basis of the team's superiority over its competitors, through raising the level of various capabilities, the most important of which is improving the level of basic skills, which are the decisive factor in most match results, and that the skill of shooting on the bird from inside the penalty area is of the greatest importance in defeating. One team over the other team.

Through the researcher's experience and his knowledge of many sources and previous studies, it became clear that there is no test to measure the skill of shooting on the bird from inside the penalty area in the game of football, so the researcher decided to design and codify such a test due to its great importance in changing and deciding the results of matches.

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## Research objective
- Designing a shooting fly test from inside the penalty area for football players aged (16-17) years.
- Rationing the shooting fly test from inside the penalty area for football players aged (16-17) years.

## Research fields
- **Human field:** Players of the National Centers for Sports Talent Care for Football in Baghdad, aged (16-17) years.
- **Time field:** (1/11/2023) to (20/1/2024).
- **Spatial field:** Stadiums of the National Centers for Nurturing Sports Talent in Football in Baghdad (Al-Shaab Stadium, Al-Zafaraniya Stadium, Al-Ghazaliyah Stadium.

## Research methodology and field procedures
### Research Methodology
The researcher adopted the descriptive method because it is the most appropriate method for the nature of the current study, and this is one of the important things that the researcher must take into account when starting to conduct the study (Abu Al-Ela Abdel Fattah and Ibrahim Al-Shaalan, 1994) [1] (Rashied, 2024) [10].

## Community and sample research
The researcher must choose the sample that he believes truly represents the original community from which it was chosen. Through this, the research community was identified, represented by players from the National Centers for Sports Talent Care in football, aged (16-17) years in Baghdad Governorate, who number (120) players. They represent three centers: (The National Center in Al-Shaab Stadium, the National Center in Al-Ghazaliyah /Al-Karkh, and the National Center in Al-Zafaraniya /Al-Rusafa), as the goalkeepers, who numbered (10) players, were excluded, in addition to the exclusion of (10) players to conduct the reconnaissance experiment, thus The total number of the sample is (100) players, representing a percentage of (83.33) of the research population.

## Devices and tools used and means of collecting information
### Equipment and tools used
- Ball launcher device.
- Football balls (10).
- Adhesive tape.
- -Metal tape measure.
- Grid to define precision areas.
- Whistle.
- Football stadium.

### Means of collecting information
- Note.
- Sources.
- Shooting test form.
- Personal interviews.

**Field research procedures:** In order to begin the research procedures, the researcher designed the shooting test in its initial form and then presented it to a group of experts and specialists in the field of tests, standards, and football in order to obtain acceptance of applying the test to the sample

and the extent of its suitability for their levels (Muwafaq Asaad Mahmoud, 2009) [6]

## Suggested test
- **Test name:** Shooting fly test from inside the penalty area.
- **The goal of the test:** To measure the accuracy of shooting on the bird from inside the penalty area.
- **Tools used:** Ball throwing device (Appendix 1), 10 soccer balls, a legal soccer field, a metal measuring tape, adhesive tape, a net to divide the goal, and a whistle.
- **Performance method:** The ball thrower is placed at a distance of (1) m from the touch line and (10) m from the goal line. An area is defined around the penalty mark with dimensions of (2 x 2) m, which is the area where the balls reach (the point where the player meets the ball). Dividing the goal into several areas using a grid to determine the accuracy points, as in Figure (1). When the test begins, the player stands around the arc of the penalty area. When the whistle blows, the ball thrower launches the ball toward the designated area. The player moves inside the penalty area to perform the shooting skill on the bird and then returns to the goal. The starting point and the start of the next attempt, and so on until the end of all attempts.
- **Registration:** Each laboratory is given (5) attempts, and the grade is calculated as follows.
- (4) Degrees for the ball that enters square No. (4).
- (3) Degrees for the ball that enters square No. (3).
- (2) A score for the ball that enters square No. (2).
- Score for the ball that enters square number (1).
- (Zero) score for the ball that is outside the goal.

## Notes
- When the ball hits one of the goal posts or the crossbar, the score is calculated for the area closest to the accuracy zone.
- The total score for the test is (20) points.
- The ball thrower can be moved to the left side of the field if there are players who prefer the left foot to score.
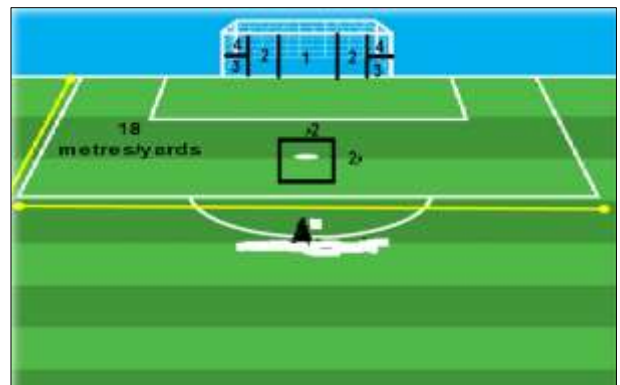


**Fig 1:** Shows the shooting flying from inside the penalty area

## Exploratory experience
The researcher conducted the exploratory experiment on a sample of (10) players from outside the legalization sample on 10/11/2023. Its purpose was to identify the difficulties and obstacles that the researchers may face during the implementation of the main experiment and to extract the

scientific foundations for the test (Najah Mahdi Shalash and Mazen Abdul Hadi, 2010) [7].

## Scientific foundations of the test
### Validity
The researcher used the content validity of the test by presenting it to experts and specialists in the field of tests and football in the form of a questionnaire, and their answers were that the test was true to what it was designed for, with a percentage of (87%).

### Stability
The retest method was used in order to ensure the stability of the test on a sample of (10) players from outside the research sample. The researcher applied the test on 15/11/2023, and after a week had passed, the test was re-applied to the same sample on 23/11/2023, and it was completed. Calculating the simple correlation coefficient (Pearson) (Raysan Khuraibet Majeed, 2001) [4] as the value of (R) calculated for the test was (0.84), which is greater

than its tabulated value, and this is evidence of the reliability of the test.

### Objectivity
An objective test is the test that gives the same results, no matter how different the graders differ, meaning that the values of the results are not affected by the subjectivity of the grader or his personal opinions (Kamal Saleh, 1997) [3]. The researcher performed the test on a sample from outside the research sample, which consisted of (10) players, and the researcher registered them for the account. The simple correlation coefficient between the scorers showed that there was a high correlation between the scores of the scorers, reaching 100% (meaning that the test is objective).

**Main experience:** The researchers conducted the main experiment on the research sample, which numbered (100) players, by using the test of shooting on the bird from inside the penalty area. The test took three days and at different times to apply the test, as shown in Table (1).

**Table 1:** Shows the dates of the test, the names of the positions, and the numbers of players

| No. | Date | National Centers for Sports Talent Care | Number of Players |
|---|---|---|---|
| 1. | 3/1/2024 | Al-Shaab Stadium | 40 |
| 2. | 5/1/2024 | Al-Ghazaliyah Stadium/Al-Karkh | 30 |
| 3. | 77/1/2024 | Al-Zafaraniya Stadium / Al-Rusafa | 30 |

## Statistical methods
The search data was processed through the Statistical Package for the Social Sciences (SPSS).

**Results and discussion:** After completing the main experimental procedures on the research sample, the two researchers decided to present the results in the form of tables to facilitate dealing with them.

**Present and discuss the statistical description and standard levels of the shooting test through the following tables**

**Table 2:** Shows the value of the arithmetic mean, standard deviation, and skewness coefficient for the research sample

| Test | Statistical methods | | |
|---|---|---|---|
| | Arithmetic mean | Standard deviation | Skewness |
| Shooting flying | 8.12 | 3.10 | 0.342- |

Table (2) shows the value of the arithmetic mean of the test, which was (8.12), with a standard deviation of (3.10), and the skewness coefficient was (-0.342).

**Table 3:** Shows the standard scores for the shooting fly test on the from inside the penalty area

| No. | Raw score | Standard scores | Modified standard score | No. | Raw score | Standard scores | Modified standard score |
|---|---|---|---|---|---|---|---|
| 100. | 14 | 1.89561 | 68.96 | 50 | 8 | -.03869 | 49.61 |
| 99. | 14 | 1.89561 | 68.96 | 49 | 8 | -.03869 | 49.61 |
| 98. | 14 | 1.89561 | 68.96 | 48 | 8 | -.03869 | 49.61 |
| 97. | 14 | 1.89561 | 68.96 | 47 | 8 | -.03869 | 49.61 |
| 96. | 14 | 1.89561 | 68.96 | 46 | 8 | -.03869 | 49.61 |
| 95. | 13 | 1.57323 | 65.73 | 45 | 8 | -.03869 | 49.61 |
| 94. | 13 | 1.57323 | 65.73 | 44 | 8 | -.03869 | 49.61 |
| 93. | 13 | 1.57323 | 65.73 | 43 | 8 | -.03869 | 49.61 |
| 92. | 12 | 1.25084 | 62.51 | 42 | 8 | -.03869 | 49.61 |
| 91. | 12 | 1.25084 | 62.51 | 41 | 8 | -.03869 | 49.61 |
| 90. | 12 | 1.25084 | 62.51 | 40 | 8 | -.03869 | 49.61 |
| 89. | 12 | 1.25084 | 62.51 | 39 | 8 | -.03869 | 49.61 |
| 88. | 12 | 1.25084 | 62.51 | 38 | 7 | -.36107 | 46.39 |
| 87. | 12 | 1.25084 | 62.51 | 37 | 7 | -.36107 | 46.39 |
| 86. | 11 | .92846 | 59.28 | 36 | 7 | -.36107 | 46.39 |
| 85. | 11 | .92846 | 59.28 | 35 | 7 | -.36107 | 46.39 |
| 84. | 11 | .92846 | 59.28 | 34 | 7 | -.36107 | 46.39 |
| 83. | 11 | .92846 | 59.28 | 33 | 7 | -.36107 | 46.39 |
| 82. | 11 | .92846 | 59.28 | 32 | 7 | -.36107 | 46.39 |
| 81. | 11 | .92846 | 59.28 | 31 | 7 | -.36107 | 46.39 |
| 80. | 10 | .60608 | 56.06 | 30 | 7 | -.36107 | 46.39 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 79. | 10 | .60608 | 56.06 | 29 | 7 | -.36107 | 46.39 |
| 78. | 10 | .60608 | 56.06 | 28 | 7 | -.36107 | 46.39 |
| 77. | 10 | .60608 | 56.06 | 27 | 7 | -.36107 | 46.39 |
| 76. | 10 | .60608 | 56.06 | 26 | 7 | -.36107 | 46.39 |
| 75. | 10 | .60608 | 56.06 | 25 | 6 | -.68345 | 43.17 |
| 74. | 10 | .60608 | 56.06 | 24 | 6 | -.68345 | 43.17 |
| 73. | 10 | .60608 | 56.06 | 23 | 6 | -.68345 | 43.17 |
| 72. | 10 | .60608 | 56.06 | 22 | 6 | -.68345 | 43.17 |
| 71. | 10 | .60608 | 56.06 | 21 | 6 | -.68345 | 43.17 |
| 70. | 10 | .60608 | 56.06 | 20 | 6 | -.68345 | 43.17 |
| 69. | 9 | .28370 | 52.84 | 19 | 6 | -.68345 | 43.17 |
| 68. | 9 | .28370 | 52.84 | 18 | 6 | -.68345 | 43.17 |
| 67. | 9 | .28370 | 52.84 | 17 | 6 | -.68345 | 43.17 |
| 66. | 9 | .28370 | 52.84 | 16 | 5 | -1.00583 | 39.94 |
| 65. | 9 | .28370 | 52.84 | 15 | 5 | -1.00583 | 39.94 |
| 64. | 9 | .28370 | 52.84 | 14 | 5 | -1.00583 | 39.94 |
| 63. | 9 | .28370 | 52.84 | 13 | 4 | -1.32822 | 36.72 |
| 62. | 9 | .28370 | 52.84 | 12 | 4 | -1.32822 | 36.72 |
| 61. | 9 | .28370 | 52.84 | 11 | 4 | -1.32822 | 36.72 |
| 60. | 9 | .28370 | 52.84 | 10 | 4 | -1.32822 | 36.72 |
| 59. | 9 | .28370 | 52.84 | 9 | 4 | -1.32822 | 36.72 |
| 58. | 9 | .28370 | 52.84 | 8 | 3 | -1.65060 | 33.49 |
| 57. | 9 | .28370 | 52.84 | 7 | 3 | -1.65060 | 33.49 |
| 56. | 9 | .28370 | 52.84 | 6 | 2 | -1.97298 | 30.27 |
| 55. | 8 | -.03869 | 49.61 | 5 | 2 | -1.97298 | 30.27 |
| 54. | 8 | -.03869 | 49.61 | 4 | 2 | -1.97298 | 30.27 |
| 53. | 8 | -.03869 | 49.61 | 3 | 1 | -2.29536 | 27.05 |
| 52. | 8 | -.03869 | 49.61 | 2 | 0 | -2.61775 | 23.82 |
| 51. | 8 | -.03869 | 49.61 | 1 | 0 | -2.61775 | 23.82 |

**Table 4:** Shows standard levels, modified standard scores, number of players, and percentages

| Standard levels | Modified standard scores | Number of players | Percentages |
|---|---|---|---|
| Very good | 59.94-68.96 | 14 | %14 |
| Good | 50.91-59.93 | 31 | %31 |
| Middle | 41.88-50.90 | 39 | %39 |
| Acceptable | 32.85-41.87 | 10 | %10 |
| Weak | 23.82-32.84 | 6 | %6 |

**Table 5:** shows the value of the arithmetic mean, the standard deviation, and the value of (t) calculated for the upper and lower groups

| Groups | Arithmetic mean | Standard deviation | T value Calculated | Level sig |
|---|---|---|---|---|
| Upper | 11.74 | 0.34 | 0.04 | 0.000 |
| Lower | 4.29 | 0.23 | | |

Through the previous tables, which show that the very good level was determined between (59.94-68.96) and the number of players was (14) players and a percentage of (14%), while the good level was determined between (50.91-59.93) and the number of players was (31) players and a percentage (31%), and the average level was determined between (41.88-50.90) and the number of players was (39) players and a percentage of (39%), while the acceptable level was determined between (23.82-32.84) and the number of players was (10) players and a percentage of (10%)), while the weak level was determined between (23.82-32.84) and the number of players reached (6) players with a percentage of (6%), as it becomes clear to us that the highest percentage was at the average level, followed by the good level. The researcher believes that these results are evidence of the ability of the test in Distinguishing between the different levels and identifying the individual differences among them by referring to the standard. This proves that the test is standardized, and here the important role of the evaluation process appears, which is not limited to determining the phenomena quantitatively as in the measurement process, but rather goes beyond that by judging the value of the phenomenon. Classifying them as weak, average, or good

(Ahmed Khater and Ali Al-Baik, 2008) [2] (Neama, Salman, & Mahdi, 2022) [8] (Essam Abdel Khaleq. 2009.) [5], and dividing the sample members so that not all of them are good or all of them are weak.

**Conclusion and recommendations**
**Conclusion**
- The shooting test on the bird from inside the penalty area was designed and codified.
- The raw scores were converted into standard scores and placed in tables so that coaches could refer to them when evaluating the level of players as a standard prepared for comparison with the level.

**Recommendations**
- Football coaches and specialists should use this test to identify the different levels of players.
- Relying on the grades and standard levels reached by the researchers as a means of objective evaluation.
- Re-rationing this test for different age groups (advanced - elite).

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**Appendix (1)**
**A detailed explanation of the American-made TK ball launcher**
The device consists of two batteries similar to a USB battery and an electric charger for the purpose of charging the device, which continues to work for two hours without electricity, and two rubber circles that are useful for throwing the ball and are mounted on a piece of iron that rotates while the device is operated by the operating switch. There is a speed switch and an iron ruler that is useful for setting the balls are then rolled onto them to get them to the two circles to be thrown, and a lever is used to lift the piece of iron to change the height of the thrown balls.

**As in the figure below**