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Designing a Skill Tests Battery for Midfield Football Players Under 17 Years Old

Aknouche Mokhtar [1] ; Sellami Abderrahim [2] ; Gasmi Abdelmalek[3]

[1,2,3]University of constantine 2 (Algeria), Laboratory of expertise and analysis of sports performance (LEAPS)

[1]aknouche.mokhtar@univ-constantine2.dz, [2]sellami@univ-constantine2.dz, [3]abdelmalek.gasmi@univ-constantine2.dz

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Corresponding author: Aknouche mokhtar,
e-mail: aknouche.mokhtar@univ-constantine2.dz

Abstract

The study aims to design a skill tests battery for midfield football players under 17 years old for the first regional teams in Annaba, designed according to the principles and stages of test design. For this purpose, we used a descriptive survey methodology on a sample of 14 players from the midfield position, selected deliberately. To collect data, 30 standardized skill tests were employed. After collecting and statistically processing the results using factor analysis, six factors were extracted, representing four core skills (passing, dribbling, ball control, and scoring). Based on these findings, the study recommends the use of the derived test battery units in evaluating midfield football players.

1. Introduction

The era we live in is characterized by the rapid pace of change and renewal in line with the additions to knowledge and the societal transformations. Therefore, it is incumbent upon us to choose ideas that withstand the test of time, and when applied, yield high-level results. This contributes to enriching and acquiring new concepts in building self-empowerment, instilling confidence in our future.

Since the inception of humanity on Earth, individuals have been engaging in the process of calibration in some way. Life without it is challenging, if not impossible, as any human activity must be framed by the existence of rules and values that regulate and guide its paths, define its course, and measure its results to ensure development. (Dawood, M. R, 2011 : 3)

Football is one of the games that has received considerable attention and studies of great importance to enhance it for the better. It is a game with specific requirements that distinguish it from other sports. (Alawi, M. H. R,1987:16)..

According to Mohamed Kishk and Amr Allah Al-Bustati, "Compound skills in football are considered the backbone relied upon by the coach during the training process. The modern approach in teaching and training football skills emphasizes the need to integrate basic skills to form compound skills that are trained extensively. This repetition and variety enable them to resemble the conditions of actual matches, stabilizing the player's performance, increasing their speed, precision, and proper behavior when facing opponents during competition." (Kashk,M., & Al-Bastati,A,2000: 77)

Modern training methods in physical education and sports must prioritize the use of tests and measures as fundamental and essential means for the sports evaluation process. This is crucial for understanding the developments occurring in physical growth and technical skills. A test is considered a regulated situation designed to showcase an individual's behavior, with its value dependent on the real correlation between the individual's performance in the test and their performance in similar situations in their real life. (Amr Allah Al-Basaty, 2001 : 242)

As for previous studies, the results of studies conducted by (Saïdi, M. A et al, 2021), and (Ben Khoua, A, 2020), and (Ben Naâma, B. A, 2017) all concluded that the majority of coaches rely on observation, personal experience, and competitive interviews to assess players' levels. This neglects scientific methods such as tests and measurements in player

evaluation. Through personal interviews and surveys of football coaches, we have observed the absence of player evaluation processes such as standardized skill tests. These tests allow the coach to assess the skill levels of players, thus enhancing strengths and addressing areas of weakness. (Mufid, A. M, 1994) indicates that excellence in performing duties in football positions and lines is significantly linked to each player's motor skills and their ability to execute offensive and defensive tactical duties (Mufid, A. M, 1994 : 84). Therefore, what we want to emphasize is that the knowledge of training content is not limited to the coach or trainer alone, but they should also know how to evaluate this training by selecting the most appropriate test batteries that align with the requirements of the playing positions. Hence, **the general question** is posed: What type of test battery can be used, according to scientific conditions, to measure the skill capabilities of midfield football players under 17 years old?

2. Method and Materials

2.1 – Keywords in the study:

Factor Analysis: Factor Analysis is a statistical method used to handle multiple data sets that are interrelated to varying degrees. It summarizes them into a form of independent classifications based on the qualitative nature of the classification. The researcher examines these classificatory foundations, exploring the common characteristics between them according to the theoretical framework and scientific logic with which they began (Faraj, 2008: 17).

Test Battery: It is the tool used to collect information for the purpose of evaluation. (Marwan, A. M., & Al-Yasseri, 2005: 29).

Skill: According to Mufti Ibrahim Hamada (1997), skill is the ability to achieve a result by performing a motor task with the utmost proficiency while expending energy in the shortest possible time. (Mufti Ibrahim Hamada, 1997, p. 31)

Football: Football is a team sport played by two teams, each consisting of 11 players, including a goalkeeper. The match is officiated by four referees, with one positioned in the center of the field, two assistant referees on the sidelines, and a fourth official as a reserve (Abdul Basir, A, 2004: 89, 90).

2.2. The survey experiment :

Before conducting the survey experiment, the researcher conducted interviews with experts to discuss the division of tests into groups. It was agreed to divide them into two groups to be performed over several days, considering the scientific sequence in the application,

from easy to difficult. Additionally, muscle fatigue during the performance of each group was taken into account, and sufficient rest periods were provided for recovery after each test.

The skill tests were conducted on five players from January 2, 2023, to January 16, 2023. They were then reapplied after two weeks to the same group from February 1, 2023, to February 15, 2023. The purpose was to understand the nature of the tests and the challenges that the researcher and the assisting team might face, as well as to assess their competence in executing and recording the skill tests, the time required for their implementation, and the effectiveness of the tools used.

2.3. Participants

Fourteen midfield players were selected to participate in our study, ranging in age from (16 ± 0.5) years, and they play for the football teams Mouloudia Berrahal and Guel Taasha in Algeria. This group of young amateur players was chosen from 320 players representing sixteen teams in the Regional Football League in Annaba. (Regional Football League Annaba, 2023), so they represent : 5.25% of the original community.

2.4. Research Methodology

The type of scientific research is determined by the methodology used. (Al-Abbadi, H. A. R. K, 2015 : 67) Therefore, we used the descriptive method with a survey approach, considering it suitable for the nature of the study.

2.5. Materials

The researchers relied on various tools to collect information and data in their study, including:

- Sources in both Arabic and foreign languages.
- Pedagogical methods.
- Skill tests : They utilized 30 skill tests as part of their methodology.

2.6. Design and Procedure

A battery of 30 skill tests was applied, organized into three sets to be performed over three sessions, with each session lasting 90 minutes.

Areas of study:

Human Field : Football players, midfielders, under 17 years old, from two teams in the first regional league in Annaba (Mouloudia Berrahal, Guelma Tasha Generation).

Time Field : The study was conducted during the period from February 26, 2023, to March 23, 2023.

Spatial Field : The study was conducted on the fields designated for the teams.

2.7. Statistical Analysis

The arithmetic mean, standard deviation, skewness coefficient, Pearson correlation coefficient, and factor analysis using the principal component method were employed. For factor extraction, orthogonal rotation using the Varimax method was utilized.

3. Results

3.1. The validity of the skill test data: To ensure the validity of the research variables represented by the skill tests and to conduct factor analysis on them, descriptive statistics were performed on the research variables. These variables include the mean, standard deviation, and skewness coefficient for Fisher and Pearson. The following table presents the descriptive statistics for the skill tests of midfield players under 17 years old.

Table 1. Represents the descriptive statistics for the results of skill tests for midfield players under 17 years old

Symbol	Variable Description	Mean	Standard Deviation	Skewness
A1	Passing the ball toward a goal drawn on the ground	51,385	12,258	-0,247
A2	Medium-range pass	23,077	2,900	-0,793
A3	Receiving the ball rebounded from a marker	16,231	3,789	-0,526
A4	Shooting the ball toward a goal drawn on a wall	29,077	5,074	0,178
A5	Kicking the ball for the farthest distance	42,210	1,950	-0,037
A6	Maneuvering the ball towards a small goal 20 m away	6,000	1,155	0,384
A7	Maneuvering towards a small goal 10 m away	5,154	0,801	-0,307
B1	Dribbling the ball around five markers	22,705	0,353	0,292
B2	Rolling between ten markers	21,438	0,492	0,186
B3	Rolling 30 m and continuously scoring five times	57,844	1,600	0,113
B4	Zigzag dribbling with the ball in figure-eight shape	7,627	0,342	-0,076
B5	Rolling the ball between markers from the goal line to the penalty area and back to the goal line	11,855	0,601	-0,403
B6	Running 30 m with the ball	6,639	0,412	-0,150

B7	Fast running with the ball	12,580	0,415	0,495
C1	Shooting the ball toward a goal drawn on a wall	43,538	10,211	0,716
C2	Scoring with balls	13,615	2,063	-0,194
C3	Accuracy in shooting at the goal	3,692	0,751	-0,784
C4	Shooting at the goal from the penalty area	6,923	0,760	0,136
C5	Scoring from movement	5,385	0,768	0,456
C6	Kicking the ball on target	14,385	1,121	-0,499
D1	Receiving and maneuvering	4,846	0,555	-0,143
D2	Stopping the ball	8,154	1,519	-0,136
D3	Stopping the ball with movement	5,385	1,502	-0,784
D4	Controlling the ball in a specific distance	73,846	16,093	-0,747
D5	Stopping the ball with the chest	5,077	0,954	-0,854
E1	Ball control in the air	109,889	10,915	-0,548
E2	Ball control within a circle with time calculation	9,308	0,751	-0,611
E3	Ball control bouncing for a distance of 20 meters	12,044	0,584	0,465
E4	Controlling, sensing, and maneuvering the ball for 30 seconds	50,923	7,654	-0,937
E5	Ball control	8,000	1,225	0,322

Source: Compiled by Researchers (2023)

Through Table N°01, we observe that the values of the skewness coefficient range between (1±), indicating that the results of skill tests for midfield players under 17 years old are distributed normally.

3.2. Factor Analysis of Skill Tests for Midfield Players Under 17 Years Old :

The factor analysis of skill tests for midfield players under 17 years old was conducted as a preliminary stage. This involved extracting the intercorrelation matrix using Pearson's correlation coefficient. Subsequently, factor extraction was performed from the correlation matrix using Principal Components Analysis (PCA).

3.3. The factor matrix for the skill tests of midfield players under 17 years old after orthogonal rotation is as follows:

During this stage, using orthogonal rotation (Varimax Method), we arrived at 09 factors. According to the acceptance conditions and

construction criteria, factors with a saturation equal to or greater than 03 variables were accepted. Additionally, the saturation value should be equal to or greater than 0.50. Therefore, 06 factors were accepted. The following table illustrates this:

Table 2. Factor matrix for skill tests for midfielders under 17 years after orthogonal rotation

	Factor								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
A1	-0,882	-0,211	-0,017	0,148	-0,098	0,091	-0,217	0,092	-0,069
A2	-0,757	0,105	0,190	0,243	0,376	-0,007	-0,190	0,091	0,053
A3	0,749	0,080	0,409	0,251	-0,238	-0,278	0,040	-0,087	-0,071
A4	0,617	0,565	-0,012	0,163	-0,042	-0,145	-0,104	0,067	0,442
A5	-0,607	0,113	0,277	0,578	-0,112	-0,178	0,019	-0,169	0,314
A6	-0,576	0,481	-0,394	-0,270	-0,385	0,062	-0,063	0,123	-0,189
A7	-0,091	0,923	0,076	0,014	0,085	-0,156	0,161	0,008	0,066
B1	0,326	0,692	-0,075	0,026	0,254	0,330	-0,213	0,186	-0,278
B2	0,172	0,623	0,453	-0,015	0,179	0,289	0,102	-0,261	0,273
B3	0,078	0,482	-0,380	-0,103	-0,187	-0,413	-0,473	0,072	-0,345
B4	0,100	-0,088	0,923	0,067	0,215	-0,022	-0,010	-0,145	-0,146
B5	0,010	-0,006	0,787	0,221	0,127	-0,312	0,044	-0,130	0,202
B6	0,215	-0,278	-0,767	0,048	0,206	-0,245	0,111	0,095	-0,237
B7	-0,001	0,013	0,201	0,888	0,166	0,132	-0,164	0,011	0,011
C1	0,198	0,505	-0,264	-0,736	0,140	-0,136	0,001	-0,116	0,206
C2	-0,025	0,171	-0,024	0,697	0,497	0,330	0,001	-0,017	-0,031
C3	0,543	0,128	-0,233	0,640	0,186	-0,195	0,009	-0,067	-0,112
C4	-0,196	-0,517	-0,179	0,583	-0,196	-0,040	0,263	0,395	-0,199
C5	-0,073	0,068	-0,027	0,106	0,920	0,227	-0,184	0,119	-0,038
C6	0,153	-0,180	-0,423	-0,110	-0,832	0,191	-0,046	0,065	-0,108
D1	-0,204	-0,093	-0,082	0,261	0,010	0,909	-0,134	0,076	0,063
D2	0,191	-0,236	0,061	0,247	0,564	-0,565	0,240	0,203	0,124
D3	0,097	-0,020	-0,181	-0,033	-0,023	-0,086	0,896	-0,142	-0,126
D4	0,140	-0,112	0,412	-0,206	-0,128	0,089	0,696	0,316	0,366
D5	0,342	0,422	0,033	-0,007	-0,104	-0,360	0,696	-0,096	-0,111
E1	0,014	-0,328	0,299	-0,085	-0,031	-0,041	-0,028	-0,830	0,109
E2	-0,177	-0,279	-0,208	-0,091	0,238	-0,132	-0,262	0,775	-0,249
E3	-0,048	-0,166	0,132	0,120	-0,631	0,315	0,073	0,636	0,139
E4	-0,037	0,025	0,124	-0,153	-0,010	0,014	-0,083	-0,135	0,942
E5	0,095	0,148	0,007	0,149	0,385	0,418	0,230	-0,405	0,518

Source: Compiled by Researchers (2023)

4. Discussion

4.1. Interpretation of the extracted factors :

* The first factor:

Table 3. Illustrates the variables that saturated on the first factor

symbol	The variable	Saturation value
B4	Curved running in the shape of (8) with the ball.	-0.882
A4	Hitting the ball towards a goal drawn on the wall.	-0.757
E5	Ball control.	0.749
C2	Scoring goals	0.617
B5	Rolling the ball between markers from the goal line to the penalty area line and back to the goal line	-0.607
B7	Fast running with the ball.	-0.576

Source: Compiled by Researchers (2023)

Through Table N°03, it is evident that the factors saturated on the first factor are (06) variables representing (19.33%) of the total for the (30) variables. In the arrangement of saturations, it is revealed that the variables saturated on the first factor include (03) tests related to ball running skill, as well as (02) tests related to shooting skill, and one test related to damping skill.

To overcome the tests related to ball running skill, the researcher suggests naming this factor " The Ball Dribbling Factor."

The test for running in the shape of (8) with the ball achieved the highest saturation on this factor, and it was selected to represent the ball running skill.

* The second factor :

Table 4. Illustrates the variables that saturated on the second factor

symbol	The variable	Saturation value
A2	Medium pass	0.923
A6	Dribbling towards a small goal 20 meters away	0.692
A7	Dribbling towards a small goal 10 meters away	0.623

Source: Compiled by Researchers (2023)

Through Table N°04, it is evident that the factors saturated on the second factor are (03) variables representing (10.00%) of the total for

the (30) variables. In the arrangement of saturations, it is revealed that the variables saturated on the second factor include (03) tests related to passing skill.

To overcome the tests related to passing skill, the researcher suggests naming this factor "Passing Factor."

The test for the medium pass achieved the highest saturation on this factor and was selected to represent the passing factor for the battery of tests in the under 17 football midfielders.

* The third factor :

Table 5. Illustrates the variables saturated by the third factor

symbol	The variable	Saturation value
B2	Dribbling between ten cones	0.923
B6	Running 30 meters with the ball	0.787
C4	Shooting on goal from the penalty area	-0.767

Source: Compiled by Researchers (2023)

Through Table N°05, it becomes evident that the factors saturated by the third factor are (03) variables representing (10.00%) of the total variables, which amount to (30) variables. Upon examining the saturation rankings, it is apparent that the variables saturated by the third factor are (02) tests related to ball dribbling skills and (01) test related to shooting skills.

To overcome the tests related to ball dribbling skills, the researcher suggests naming this factor "The Ball Dribbling Factor".

To ensure that the dribbling between 10 cones test has the highest saturation on this factor, it has been selected to represent the Ball Dribbling Factor in the battery of tests for under 17 football midfielders.

*** The fourth factor:**

Table 6. Illustrates the variables saturated by the fourth factor

symbol	The variable	Saturation value
A1	Passing the ball towards a goal marked on the ground	0.888
A3	Rebound handling from a rebounder	-0.736
E2	Controlling the ball within a circle with consideration of time	0.697
C1	Striking the ball towards a goal drawn on a wall	0.640
B3	Dribbling 30 meters and scoring continuously for five times	0.583

Source: Compiled by Researchers (2023)

Through Table N°06, it becomes evident that the factors saturated by the fourth factor are (05) variables, representing (16.67%) of the total variables, which amount to (30) variables. By examining the saturation rankings, it is apparent that the variables saturated by the fourth factor are (02) tests related to passing skills, and (01) test each related to ball dribbling, ball control, and scoring skills.
To address the tests specific to passing skills, the researcher suggests naming this factor "Passing Factor. "
As the test for passing the ball towards a goal marked on the ground attains the highest saturation, it has been selected to represent the Passing Factor in the battery of tests for under 17 football midfielders.

*** The fifth factor:**

Table7. Illustrates the variables saturated by the fifth factor

symbol	The variable	Saturation value
D5	Stopping the ball with the chest	0.896
D2	Stopping the movement of the ball	0.696
D1	Receiving and handling	0.696

Source: Compiled by Researchers (2023)

Through Table N°07, it is evident that the factors saturated by the fifth factor are (03) variables, representing (10.00%) of the total variables, which amount to (30) variables. By examining the saturation rankings, it is apparent that the variables saturated by the fifth factor are (02)

tests related to the skill of intercepting and (01) test related to passing skills.

To address the tests specific to interception skills, the researcher suggests naming this factor "Interception Factor."

The researcher believes that the skill of ball control plays a prominent role in the game of football, as it serves as the starting point for performing other skills, especially controlling the ball under the foot, which is the most commonly used in the match. This aligns with what was indicated by (Imad Zubeir Ahmed, 2005) that trapping the ball under the foot is one of the most commonly used types of ball control in football.

As the test for stopping the ball with the chest attains the highest saturation, it has been selected to represent the Interception Factor in the battery of tests for under 17 football midfielders.

* The sixth factor :

Table 8. Illustrates the variables saturated by the sixth factor

symbol	The variable	Saturation value
C5	Scoring from motion	-0.830
B1	Curved dribbling around five cones	0.775
E4	Ball control, feeling, and handling within 30 seconds	0.636

Source: Compiled by Researchers (2023)

Through Table N°08, it is evident that the factors saturated by the sixth factor are (03) variables, representing (10.00%) of the total variables, which amount to (30) variables. By examining the saturation rankings, it is apparent that the variables saturated by the sixth factor are (01) test each related to scoring skills, ball dribbling, and ball control.

To address the tests specific to scoring skills, the researcher suggests naming this factor "Scoring Factor."

As the test for scoring from motion attains the highest saturation, it has been selected to represent the Scoring Factor in the battery of tests for under 17 football midfielders.

4.2. Selection of test battery components for skill assessment among under 17 football midfielders:

Table 9. Skill Tests Battery Units for Midfielders in Football Under 17 Years Old

	The test	Measuremet unit	The factor	The factor's name
1	The ball dribbling test in the shape of (8)	Second	The first one	The Ball Dribbling Factor
2	Medium pass	Degree	The second one	The Passing Factor
3	Dribbling between 10 cones	Second	The third one	The Ball Dribbling Factor
4	Passing the ball towards a goal marked on the ground	Degree	The fourth one	The Passing Factor
5	Stopping the ball's motion with the chest	Degree	The fifth one	The Interception Factor
6	scoring from motion	Degree	The sixth one	The Scoring Factor

Source: Compiled by Researchers (2023)

5. Conclusion

Based on the results of the factor analysis using Varimax rotation for the skill tests applied to under 17 attacking football players, the following conclusions were drawn:

1. Six factors for the core skills were identified based on the significance of the skill tests for the midfield football players under 17 years in Annaba, which are:
    - Factor 1: Ball Dribbling.
    - Factor 2: Passing.
    - Factor 3: Ball Dribbling.
    - Factor 4: Passing.
    - Factor 5: Interception.
    - Factor 6: Scoring.
2. Skill tests were selected to infer the skill factor characteristics for under 17 football midfielders, derived from factor analysis:
    - Dribbling between 8 cones test representing Factor 1: Ball Dribbling.
    - Medium-range passing test representing Factor 2: Passing.

- Dribbling between 10 cones test representing Factor 3: Ball Dribbling.
- Passing the ball towards a goal marked on the ground test representing Factor 4: Passing.
- Stopping the ball with the chest test representing Factor 5: Interception.
- Scoring from motion test representing Factor 6: Scoring.

3. Test battery units were constructed for the skill assessments in the evaluation of football midfielders under 17 years old.

6 . Recommendations

- It is recommended to regularly conduct ball dribbling and passing tests to assess the performance development of football midfielders under 17 years old. These two skills appear to be the most crucial based on the results.
- The necessity of individual training, considering each playing position and its specific requirements, is essential to achieve satisfactory results.
- Using the proposed skill test battery units in the assessment and development of football midfielders under 17 years old provides an effective representation of a variety of fundamental skills.

References

- Abdul Basir, A. (2004). *Muscle Strength Training*, 1th edition. Cairo: Egyptian Library for Printing and Publishing.
- Ahmed, I. Z. (2005). *Technique and Tactics in Five-a-Side Football*, 1th editon. Baghdad: Al-Sindbad Printing Company.
- Al-Abbadi, H. A. R. K. (2015). *Fundamentals of Scientific Research Writing in Physical Education and Sports Sciences*. Iraq: Al-Ghad Printing and Publishing Company.
- Alawi, M. H. R., (1987). *Skill and Psychological Tests in the Sports Field*, 1th edition. Cairo: Arab Thought House.

- Amr Allah Al-Basaty. (2001). *Physical and Functional Preparation in Football: Measurement and Training Planning*. Alexandria: New University Publishing House.
- Ben Khoua, A., Ben Nama, B., Sanusi, A. K., & Boukchiche, M. (2020). "The Status of Tests and Measurements in Evaluating Skill Performance among Youth Coaches." *The Scientific Journal of Physical Education and Sports Sciences*, 17(1), 120-134.
- Ben Naâma, B. A., Ben Khoua, A., & Zerf, M. (2017). "The Reality of Player Selection in Algerian Football Under 20 Years Old: Between Scientific and Traditional Approaches." *The Scientific Journal of Physical Activity and Sports Technology*, 14(1), 30-47.
- Dawood, M. R., (2011). *Modern Trends in Supervision and Evaluation in the Educational and Sports Fields*. Beirut: Scientific Books House.
- Farg Safwat. (2008). *Psychological Measurement*, 6th edition. Cairo: Anglo Egyptian Library.
- Marwan, A. M., & Al-Yasseri, M. J. (2005). *Measurement and assessment in physical education and sports*. Oman: Al-Waraq Foundation.
- Kashk, M., & Al-Bastati, A. (2000). *Principles of Skill and Tactical Preparation in Football*, 1th edition. Egypt: Book Center for Publishing.
- ligue regionale de football annaba. (2023, 11, 10). Récupéré sur L.R.F. Annaba – À la une : https://www.lrf-annaba.org/
- Mufid, A. M. (1994). *"A Study of Some Special Physical Abilities of Football Players in Different Playing Positions in the Age Group of 14-16 Years."* Unpublished Master's Thesis, College of Physical Education for Boys, Alexandria.
- Mufti Ibrahim Hamada. (1997). *Innovations in Skill and Tactical Preparations for Football Players*. Cairo: Arab Thought Publishing House.
- Saïdi, M. A., Meem, M., & Hamzaoui, H. (2021). "The Reality of Selection and Guidance towards Playing Positions among Youth Football Players." *The Journal of Excellence in Physical Education and Sports Sciences*, 6(1), 161-181.