



ISSN: 2617-6548

URL: www.ijirss.com



A data-driven multidimensional performance evaluation framework for university soccer midfielders

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Abstract

Traditional methods for evaluating soccer midfielders often rely on subjective judgment, which fails to comprehensively reflect players' multidimensional performance. This study constructs a systematic, data-driven evaluation model for midfield players using Principal Component Analysis (PCA) and Analytic Hierarchy Process (AHP), providing a scientific and quantitative approach to player selection and training. The model integrates six primary dimensions: performance indicators (weight 0.4269), psychological factors (weight 0.2050), physical fitness (weight 0.1738), technical skills (weight 0.1001), body morphology (weight 0.0596), and physiological function (weight 0.0346). It shows that "penetrative pass" (weight 0.2521) and "target focus" (weight 0.1185) are the most influential secondary indicators, highlighting the midfielder's essential role in offensive organization, team coordination, and pressure management. While technical skills, body morphology, and physiological function carry lower weights, they provide critical supplementary insights for comprehensive evaluations. Through expert scoring and robust validation, the study demonstrates the model's applicability for optimizing midfielder selection, training design, and performance enhancement. This model offers a systematic evaluation tool for Chinese university soccer, establishing a scientific foundation for improving the selection and development pathways for midfield players.

Keywords: Data-driven model, Midfielder evaluation, Performance indicators, Scientific selection, Training optimization.

DOI: 10.53894/ijirss.v8i2.5555

Funding: This study received no specific financial support.

History: Received: 7 February 2025 / Revised: 11 March 2025 / Accepted: 17 March 2025 / Published: 21 March 2025

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Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Mahasarakham University (HZU/CAF/MU/2024/12 and 06/12/2024).

Publisher: Innovative Research Publishing

1. Introduction

Midfielders play a central role in football, acting as the link between defense and attack, controlling the pace of the game, intercepting opposition attacks, and creating scoring opportunities. These responsibilities require midfielders to excel in passing and ball control while demonstrating exceptional physical fitness, technical skills, tactical awareness, and psychological resilience [1]. However, the performance of midfielders is influenced by multiple factors, and traditional evaluation methods often lack comprehensiveness, making it difficult to assess their overall performance scientifically [2, 3]. Therefore, establishing a systematic and scientifically grounded evaluation framework is critical for selecting and training midfielders effectively [4]. In the context of Chinese campus football, the development of midfielders faces significant challenges. Due to the absence of standardized and scientifically validated evaluation systems, coaches' selection and training decisions often rely on subjective judgment, influenced by personal experience and biases. This subjectivity risks overlooking promising talent and fails to meet the developmental needs of players, particularly at the university level, where athletes are expected to transition to more competitive environments [5, 6]. These deficiencies have directly led to the underperformance of Chinese midfielders in international competitions, emphasizing the need for data-driven methods to improve talent identification and training strategies [1, 7]. Although China has made significant progress in promoting campus football, such as establishing over 50,000 campus football model schools and engaging approximately 55 million students, inefficiencies in training and evaluation practices for midfielders remain prevalent. These issues limit the performance of Chinese university football teams on regional and global stages [4]. Addressing these challenges requires the development of a scientifically robust and data-driven evaluation model tailored to the unique needs of Chinese university midfielders. Such a model can provide objective and actionable insights for talent identification and individualized training, bridging the gap between amateur and professional football. Midfielder performance is inherently multidimensional, encompassing physical, technical, tactical, and psychological attributes. Physical metrics, such as endurance, speed, and agility, are critical for defensive and offensive transitions, while technical skills, including passing accuracy, ball control, and shooting precision, are essential for creating and converting scoring opportunities [3]. Tactical awareness, such as decision-making, spatial positioning, and adaptability to dynamic game scenarios, distinguishes elite midfielders by enabling them to anticipate opposition movements and implement team strategies effectively [2, 4]. Additionally, psychological resilience, including the ability to maintain focus under pressure and make effective decisions in critical moments, plays a vital role in achieving consistent performance [1]. These interconnected dimensions highlight the need for comprehensive evaluation models that integrate multiple performance indicators rather than relying on isolated measures [1, 4]. Building on this background, this study proposes a systematic framework for evaluating the performance of university-level midfielders in Chinese campus football. The framework integrates multidimensional performance metrics and employs advanced statistical methods to ensure objectivity and practicality. Initially, 34 performance indicators were identified through a comprehensive review of the literature and expert consultations, covering six core dimensions of midfielder performance: body morphology, physical fitness, physiological function, psychological factors, technical skills, and performance indicators [2, 3]. Subsequently, T-tests and regression analyses were used to refine and validate these indicators, reducing the number to 18 critical variables [8]. Principal Component Analysis (PCA) was then applied to simplify the data structure and emphasize the most influential variables, while the Analytic Hierarchy Process (AHP) was utilized to assign relative weights to the six dimensions and their respective indicators [9]. Finally, these weighted indicators were integrated into a comprehensive evaluation model, providing a structured and quantitative framework for assessing midfielder performance across multiple dimensions. This model aims to equip coaches and sports scientists with scientifically grounded tools for making informed decisions regarding talent identification and designing individualized training programs, thereby addressing the diverse demands of the midfield position.

2. Methodology

The proposed model not only addresses the limitations of subjective assessments but also aligns with international standards for talent development. By implementing this model, Chinese universities can standardize their midfielder selection processes, improve training effectiveness, and better prepare players for the competitive demands of professional football. Ultimately, this approach contributes to the broader objective of elevating the overall standard of Chinese football and fostering its integration into the global football ecosystem.

2.1. Conceptual Framework

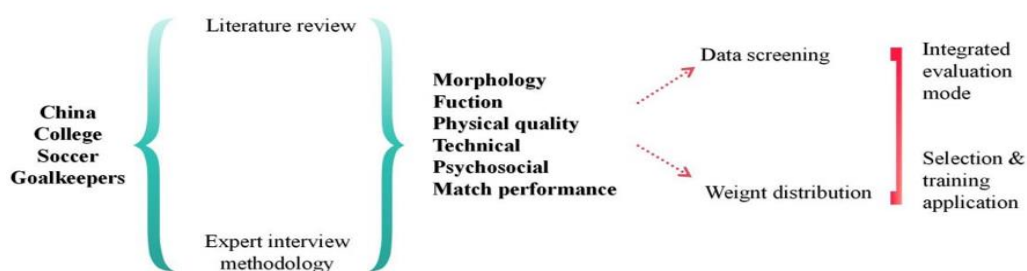


Figure 1.

Research Framework for the Integrated Evaluation Model of College Soccer Midfielders.

2.2. Study Design and Participants

This study employed a cross-sectional survey design, combining quantitative methods and experimental tests. A total of 80 male soccer players from Chinese universities were recruited, including 20 midfielders, with 10 classified as high-level and 10 as ordinary-level midfielders. Participants were selected using a stratified sampling method to ensure diversity and representativeness, considering factors such as age, training experience, and match history. The selection criteria aimed to include midfielders with varying levels of expertise to enhance the generalizability of the findings [3]. All participants provided informed consent before the study, and ethical approval was obtained from the relevant university committees.

2.3. Data Collection Procedures

2.3.1. Survey Assessments

A structured questionnaire was administered to evaluate the key dimensions of midfielder performance, including body morphology, physical fitness, psychological factors, technical skills, and match performance. Self-assessment responses were recorded on a five-point Likert scale to quantify participants' subjective perceptions of their performance.

2.3.2. Experimental Tests

Performance-based tests were conducted to objectively assess midfielders' match performance, focusing on penetrative passes, reaction time, decision-making, and ball control in simulated match scenarios. All tests followed standardized protocols and were conducted in a controlled environment to ensure the consistency and reliability of results. Specific to the midfielder group, data for high-level and ordinary-level midfielders were separately recorded to facilitate comparative analysis in subsequent stages.

2.3.3. Ethical Considerations

This study strictly adhered to ethical research principles to protect the rights of participants and ensure the scientific integrity and confidentiality of the data collected. The research was approved by the Mahasarakham University Ethics Committee (Approval No. 256-089/2024) on April 25, 2024, with the approval valid until April 24, 2025. The study underwent an expedited review process, and all activities were conducted in Nanning City, Guangxi Province, China. Research procedures were meticulously designed to minimize any physical or psychological risks to participants.

2.3.4. Expert Evaluation Process

To maintain the scientific rigor and quality of the research, a detailed evaluation process was implemented:

1. **Indicator Validation (IOC Scoring):** Experts assessed the content validity of the selection indicator system, focusing on critical performance metrics for the midfielder position.
2. **Review of On-site Data Collection:** The proposed plan for data collection at multiple competition venues was reviewed to ensure feasibility and alignment with the study's objectives.

2.3.5. Indicator Refinement and Expert Validation

The initial set of 34 secondary indicators was derived from a comprehensive literature review. To enhance their practical applicability, interviews were conducted with 10 football experts, including experienced coaches, trainers, and directors of university football programs. Feedback from these experts was used to refine and validate the indicators, resulting in a final set of 18 secondary indicators [10].

2.3.6. Statistical Methods

A multi-stage analytical approach was adopted to ensure the scientific rigor of the comprehensive evaluation model:

1. **T-tests and Regression Analysis:** These statistical tools were employed to screen and validate the relevance of the initial indicators, removing redundancies and ensuring the final set accurately reflected performance variables.
2. **Principal Component Analysis (PCA):** PCA was applied to reduce data dimensionality and identify the most influential factors affecting midfielder performance. This method provided insights into the hierarchical structure of the indicators and ensured appropriate emphasis on key variables [8].
3. **Analytic Hierarchy Process (AHP):** AHP was used to assign relative weights to each indicator and dimension, incorporating expert judgment to ensure operational feasibility and scientific accuracy [9].

2.3.7. Bias Control and Data Reliability

Several measures were implemented to minimize bias and ensure data reliability. All tests were conducted under identical environmental conditions using standardized equipment and procedures. Each measurement was repeated multiple times to improve reliability, and data validation processes were employed to cross-check results. Consistency was maintained across all stages of data collection and analysis, effectively reducing potential confounding factors that could influence the findings.

2.3.8. Data Analysis

The final set of 18 secondary indicators was analyzed using PCA and AHP. PCA was used to identify the principal components contributing most significantly to midfielder performance, reducing data complexity and focusing on the most impactful variables. AHP provided a structured framework for assigning weights to each indicator, ensuring a balanced

representation of all dimensions in the comprehensive evaluation model. Together, these methods constructed a robust framework for multidimensional evaluation and quantification of midfielder performance.

2.3.9. Instruments

This study aimed to construct a comprehensive evaluation model to assess midfielder performance across six core dimensions: body morphology, physical fitness, physiological function, psychological factors, technical skills, and match performance. The research sample included 20 midfielders from Chinese university soccer teams, classified into two groups based on the China University Football League (CUFL) division standards. The high-level group consisted of 10 midfielders from the Super Champion League and Champion League, who typically had experience in national or professional competitions. The ordinary group comprised 10 midfielders who primarily participated in regional or intra-campus matches, representing average university students' soccer skills. This grouping reflects the distinct competitive levels in campus soccer and provides a robust basis for evaluating performance differences.

3. Results

3.1. Principal Component Analysis (PCA) Results

Principal Component Analysis (PCA) was applied to identify the most significant contributors to midfielder performance, simplifying the dataset and emphasizing the most critical variables. Table 1 illustrates the PCA loadings for key indicators.

Table 1.
PCA Loadings for Midfielder Performance Indicators.

Principal Component Analysis (PCA) Loadings for Midfield Players	
Indicator	PC1 Loadings
Skeletal Muscle (kg)	0.1838
Yo-Yo Intermittent Recovery Test	0.1836
Emotion Control	0.1833
Target Focus	0.1827
Dominant Leg Kick Distance	0.1824
Left Leg Jump Height	0.1810
Vertical Jump Height	0.1810
30m Sprint Time	0.1808
Long Pass Score	0.1799
T Test Time	0.1799
Attention Stability	0.1798
Vertical Jump Height / Height Ratio	0.1787
Right Foot Shot	0.1779
Shot	0.1771
Lean Body Mass / Body Weight $\times 100$	0.1769
Block Passing Lane	0.1768
Right Leg Jump / Height Ratio	0.1764
Short Pass Score	0.1763
Tackle	0.1758
Maximum Oxygen Uptake / Weight	0.1756
Breath Holding Time	0.1756
Penetrative Pass	0.1745
Horizontal Visual Field	0.1732
Vital Capacity	0.1766
Weight	0.1464
Height	0.1584
Inhaled Chest Circumference	0.1441
Exhaled Chest Circumference	0.1320
Comprehensive Technical Time	0.1802
Non-Dominant Leg Kick Distance	0.1727

The PCA results reveal that physical fitness, psychological factors, and performance indicators are the most influential dimensions in midfielder performance. Notable indicators such as Skeletal Muscle (kg) (0.1838), Yo-Yo Intermittent Recovery Test (0.1836), and Emotion Control (0.1833) indicate the importance of endurance, mental resilience, and technical execution in determining midfielder success.

3.2. Final Weight Calculation for Primary Indicators

Using the Analytic Hierarchy Process (AHP), weights for six primary dimensions were calculated to reflect their importance in evaluating midfielder performance Table 2 presents the results.

Table 2.

Final Weight Calculation for Primary Indicators.

Primary Indicator	Weight
Performance Indicators	0.4269
Psychological Factors	0.2050
Physical Fitness	0.1738
Technical Skills	0.1001
Body Morphology	0.0596
Physiological Function	0.0346

Performance indicators hold the highest weight (42.69%), highlighting their critical role in evaluating midfielder effectiveness. Psychological factors (20.50%) and physical fitness (17.38%) are also significant contributors, emphasizing the multifaceted nature of midfielder performance.

3.3. Final Weight Calculation for Secondary Indicators

Each primary indicator encompasses several secondary indicators. The final weights for secondary indicators were computed by combining their respective weights with the primary indicator weights. Table 3 provides a detailed breakdown.

Table 3.

Final Weight Calculation for Secondary Indicators.

Final Weight Calculation for Midfield Players				
Primary Indicator	Primary Indicator Weight	Secondary Indicator	Secondary Indicator Weight	Final Weight
Performance Indicators	0.4269	Penetrative Pass	0.5907	0.2521
-	-	Shot	0.2762	0.1179
-	-	Tackle	0.1331	0.0569
Psychological Factors	0.2050	Target Focus	0.5778	0.1185
-	-	Attention Stability	0.2731	0.0560
-	-	Emotion Control	0.1491	0.0306
Physical Fitness	0.1738	Vertical Jump Height / Height Ratio	0.3647	0.0634
-	-	Dominant Leg Kick Distance	0.2265	0.0394
-	-	T Test Time	0.1367	0.0238
-	-	Vertical Jump Height	0.1079	0.0187
-	-	30m Sprint Time	0.0864	0.0150
-	-	Yo-Yo Intermittent Recovery Test	0.0788	0.0137
Technical Skills	0.1001	Right Foot Shot	0.5745	0.0575
-	-	Long Pass Score	0.2672	0.0267
-	-	Short Pass Score	0.1583	0.0159
Body Morphology	0.0596	Height	0.5579	0.0332
-	-	Weight	0.2633	0.0157
-	-	Skeletal Muscle (kg)	0.1219	0.0073
-	-	Lean Body Mass / Body Weight $\times 100$	0.0569	0.0034
Physiological Function	0.0346	Maximum Oxygen Uptake / Weight	0.5778	0.0200
-	-	Breath Holding Time	0.2731	0.0094
-	-	Horizontal Visual Field	0.1491	0.0052

3.3.1. Key Findings

1. Performance Indicators Dominate: Performance indicators contribute the highest weight (42.69%) to the model, with penetrative passing emerging as the most critical secondary indicator (25.21%).
2. Significance of Psychological Factors: Psychological factors (20.50%) are key contributors, particularly target focus (11.85%) and attention stability (5.60%).
3. Importance of Physical Fitness: Physical fitness accounts for 17.38%, with notable contributions from vertical jump height/height ratio (6.34%) and dominant leg kick distance (3.94%).

4. Holistic Evaluation: The inclusion of dimensions like body morphology (5.96%) and physiological function (3.46%) ensures a well-rounded evaluation model for midfielder performance.

4. Discussion

This study presents a comprehensive evaluation model that uses multidimensional indicators to assess the performance of midfielder players. The findings provide critical insights into the key determinants of midfielder success and offer actionable guidance for training and talent selection.

4.1. Dominance of Performance Indicators

Performance indicators emerged as the most influential dimension, accounting for 42.69% of the total model weight. Among these, penetrative pass contributed the highest secondary weight (25.21%), emphasizing its crucial role in modern football for breaking defensive lines and creating scoring opportunities. This finding aligns with Bradley, et al. [11] who identified passing accuracy as a key determinant of match success. Furthermore, shooting accuracy (11.79%) and tackling (5.69%) highlight the dual responsibilities of midfielders in offensive and defensive transitions. These skills are essential for maintaining possession, creating scoring opportunities, and preventing opponent advances.

Given the importance of these indicators, talent identification protocols should evaluate players' abilities to execute accurate and timely passes under high-pressure conditions. For example, coaches can simulate defensive scenarios during trials to assess a player's capacity for penetrative passing. Training programs should also incorporate drills that enhance quick decision-making and passing precision in constrained spaces, mimicking real-match situations.

4.2. Psychological Resilience as a Key Attribute

Psychological factors accounted for 20.50% of the total model weight, with target focus (11.85%) and attention stability (5.60%) emerging as the most significant secondary indicators. These findings align with Sarmiento, et al. [1] who emphasized the role of psychological resilience in maintaining consistent performance under competitive pressure. Midfield players frequently operate in dynamic and high-stakes environments where adaptability, focus, and split-second decision-making are critical.

Assessing psychological resilience during selection processes can involve situational simulations and cognitive tests, enabling coaches to observe how players respond under stress. Effective training interventions might include pressure-simulation drills that help players maintain composure and execute tactical plans. Additionally, tools such as wearable devices and virtual reality systems can be used to develop spatial awareness and enhance focus, both critical for midfield performance.

4.3. Physical Fitness and Supportive Performance

Physical fitness contributed 17.38% to the overall model, with indicators such as vertical jump height/height ratio (6.34%) and dominant leg kick distance (3.94%) reflecting the physical demands of midfield roles. These findings underscore the importance of explosive power, endurance, and agility, particularly in aerial duels and long-range passing. Dellal, et al. [12] similarly noted that the physical requirements of midfielders extend across all areas of the pitch, making these attributes vital for sustained high-level performance.

In talent identification, standardized physical fitness tests, such as vertical jump assessments and long-range passing drills, provide measurable insights into a player's physical capabilities. Training programs should prioritize exercises that enhance explosiveness and strength, such as plyometric drills and weighted ball training. These activities can improve a player's ability to excel in physical contests and deliver accurate long-range passes.

4.4. Balanced Contribution of Technical Skills

Technical skills accounted for 10.01% of the model weight, with right-foot shot accuracy (5.75%) identified as the most critical secondary indicator. This finding reinforces the importance of technical precision in creating and converting scoring opportunities. Carling, et al. [13] similarly highlighted those technical skills such as shooting and passing play pivotal roles in maximizing a team's match efficiency. Complementary indicators, including long pass accuracy (2.67%) and short pass accuracy (1.59%), further reflect the multifaceted technical demands placed on midfielders.

Evaluating technical skills during trials requires dynamic assessments that replicate match scenarios, where players must demonstrate shooting accuracy and tactical awareness under pressure. Training programs should incorporate drills designed to replicate match conditions, encouraging players to develop proficiency in both dominant and non-dominant feet, thereby enhancing their tactical versatility.

4.5. Comprehensive Assessment through Multidimensional Indicators

While performance indicators dominate the model, other dimensions such as body morphology (5.96%) and physiological function (3.46%) ensure a holistic evaluation framework. Indicators like height (3.32%) and maximum oxygen uptake/weight (2.00%) play critical roles in sustaining high-intensity performance and providing a physical advantage during contests. These findings align with Vaeyens, et al. [14] who emphasized the importance of integrating multiple dimensions in talent evaluation.

Selection processes should include advanced assessments of body composition and endurance to identify players with optimal physical profiles for high-level competition. Interval training programs aimed at improving aerobic capacity and

tailored strength-conditioning routines designed to optimize lean muscle mass can further enhance a player's physical readiness.

4.6. Practical Implications

The findings of this study have significant implications for training and talent development. The dominance of performance indicators such as penetrative passing and shooting underscores the need for precise technical and tactical training, while the importance of psychological resilience highlights the value of mental conditioning in competitive environments. The inclusion of physical fitness and body morphology as supporting dimensions ensures a well-rounded approach to player development. By integrating these insights into selection and training protocols, coaches and sports scientists can make more informed decisions that align with the demands of modern football.

5. Conclusion

This study developed a multidimensional evaluation model to systematically assess the performance of midfield players. By integrating Principal Component Analysis (PCA) and the Analytic Hierarchy Process (AHP), the model identified and quantified the contributions of six key dimensions: performance indicators, psychological factors, physical fitness, technical skills, body morphology, and physiological function. The model's validity and reliability were confirmed with a consistency ratio (CR = 0.0932), demonstrating its robustness as a scientific evaluation tool.

5.1. Key Findings

5.1.1. Dominance of Performance Indicators

Performance indicators emerged as the most critical dimension, accounting for 42.69% of the total weight. The high contribution of penetrative passing (25.21%) emphasizes its role in modern football as a core skill for breaking defensive lines and initiating scoring opportunities. Supporting indicators, such as shooting accuracy (11.79%) and tackling (5.69%), further highlight the dual responsibilities of midfielders in both offensive and defensive phases.

5.1.2. Significance of Psychological Factors

Psychological factors accounted for 20.50% of the model, with target focus (11.85%) and attention stability (5.60%) identified as essential components. These findings underscore the importance of mental resilience and decision-making under pressure, which are critical for midfield players operating in dynamic, high-stakes scenarios.

5.1.3. Supportive Role of Physical Fitness

Physical fitness contributed 17.38% of the total weight, with key indicators such as vertical jump height/height ratio (6.34%) and dominant leg kick distance (3.94%) reflecting the physical demands of aerial duels and long-range passing. The findings reinforce the importance of explosive power and endurance for midfield roles.

5.1.4. Balanced Contribution of Technical Skills

Technical skills, accounting for 10.01% of the model weight, were primarily represented by right-foot shot accuracy (5.75%). These results highlight the need for precise technical execution to maintain possession and capitalize on scoring opportunities, particularly under high-pressure conditions.

5.1.5. Comprehensive Integration of Body Morphology and Physiological Function

Body morphology (5.96%) and physiological function (3.46%) served as supportive dimensions in the model. Indicators such as height (3.32%) and maximum oxygen uptake/weight (2.00%) demonstrated their critical roles in sustaining high-intensity performance and providing physical advantages in competitive contexts.

5.2. Practical Implications

The findings have several practical implications for training, talent identification, and performance evaluation in football:

1. **Data-Driven Talent Identification:** The model offers an objective framework for identifying promising midfield players by emphasizing high-weight indicators such as penetrative passing, focus, and physical explosiveness.

2. **Targeted Training Programs:** Insights from the model support the design of training programs that prioritize key performance areas while ensuring a balanced development across physical, technical, and psychological dimensions.

3. **Scientific Decision-Making:** The integration of multidimensional indicators provides coaches and sports scientists with a robust, evidence-based tool for optimizing player development and performance evaluation.

6. Limitations and Recommendations for Future Research

6.1. Limitations

While the evaluation model developed in this study demonstrates robustness and practical applicability, certain limitations should be acknowledged:

6.1.1. Sample Size and Diversity

The study sample consisted of university-level midfield players, primarily drawn from Chinese campuses. This relatively homogenous group may limit the generalizability of the findings to other contexts, such as professional leagues or international competitions.

6.1.2. Static Testing Environment

The performance indicators were primarily assessed in controlled environments, which may not fully capture the dynamic and unpredictable nature of real-match scenarios. Factors such as opponent behavior, crowd influence, and match-specific pressures were not directly accounted for in the evaluation.

6.1.3. Exclusion of External Influences

The model did not consider external factors such as coaching strategies, team dynamics, or match context, which can significantly influence a player's performance.

6.1.4. Technology Limitations

Although statistical techniques such as PCA and AHP ensured data-driven reliability, the study lacked the integration of advanced wearable devices or tracking technologies that could provide more precise real-time performance data.

7. Recommendations for Future Research

7.1. Expanding the Sample Scope

Future studies should validate the model using a broader and more diverse sample, including players from different competitive levels (e.g., professional and amateur leagues) and cultural backgrounds. This would enhance the generalizability and applicability of the model across various football contexts.

7.2. Dynamic Match Data Integration

Incorporating real-time match data, such as GPS tracking and video analysis, would provide deeper insights into a player's performance under dynamic and competitive conditions. These data could supplement the static metrics and improve the model's ability to predict real-world performance.

7.3. Longitudinal Studies

Conducting longitudinal studies to monitor players' progress over multiple seasons would help validate the model's effectiveness in tracking development and predicting long-term success.

7.4. Advanced Technological Adoption

The integration of wearable devices, motion sensors, and AI-driven analytics can provide more precise measurements of physical, technical, and psychological performance. These technologies can also identify subtle patterns those static methods might overlook.

7.5. Exploring External Factors

Future research should consider the influence of external factors such as tactical systems, coaching styles, and team dynamics. Including these variables would create a more holistic model that captures the interplay between individual performance and team strategies.

7.6. Application in Other Positions

While this study focused on midfield players, adapting and testing the model for other football positions (e.g., defenders, forwards, and goalkeepers) could expand its utility and provide a comprehensive evaluation framework for the entire team.

7.7. Cross-Disciplinary Collaboration

Future research should involve collaboration between sports scientists, psychologists, and data analysts to refine the model further. Cross-disciplinary approaches could ensure the integration of diverse perspectives and improve the model's practicality.

References

- [1] H. Sarmiento, M. T. Anguera, A. Pereira, and D. Araújo, "Talent identification and development in male football: A systematic review," *Sports Medicine*, vol. 48, pp. 907-931, 2018. <https://doi.org/10.1007/s40279-017-0851-7>
- [2] C. Carling, J. Bloomfield, L. Nelsen, and T. Reilly, "The role of motion analysis in elite soccer: Contemporary performance measurement techniques and work rate data," *Sports Medicine*, vol. 38, no. 10, pp. 839-862, 2008. <https://doi.org/10.2165/00007256-200838100-00003>
- [3] A. Dellal, D. P. Wong, W. Moalla, and K. Chamari, "Physical and technical activity of soccer players in the French First League—with special reference to their playing position," *International Journal of Sports Medicine*, vol. 31, no. 12, pp. 137-145, 2010. <https://doi.org/10.1055/s-0030-1264202>
- [4] R. Vaeyens, M. Lenoir, A. M. Williams, and R. M. Philippaerts, "Talent identification and development programmes in sport: Current models and future directions," *Sports Medicine*, vol. 38, no. 9, pp. 703-714, 2008. <https://doi.org/10.2165/00007256-200838090-00001>

- [5] A. M. Williams and T. Reilly, "Talent identification and development in soccer," *Journal of Sports Sciences*, vol. 18, no. 9, pp. 657-667, 2000. <https://doi.org/10.1080/02640410050120041>
- [6] J. Bangsbo and P. Krstrup, "Physical demands and physiological response to high-intensity intermittent exercise in football," *Sports Medicine*, vol. 38, no. 9, pp. 657-684, 2008. <https://doi.org/10.2165/00007256-200838090-00002>
- [7] T. J. Gabbett and R. Whiteley, "Physical characteristics and performance indicators of soccer goalkeepers: A longitudinal study," *International Journal of Sports Science & Coaching*, vol. 16, no. 4, pp. 651-660, 2021.
- [8] I. T. Jolliffe, *Principal component analysis*, 2nd ed. United Kingdom: Springer, 2002.
- [9] T. L. Saaty, *The analytic hierarchy process*. United States: McGraw-Hill, 1980.
- [10] D. L. Tomlin and H. A. Wenger, "The relationship between aerobic fitness and recovery from high intensity intermittent exercise," *Sports Medicine*, vol. 31, no. 1, pp. 1-11, 2001. <https://doi.org/10.2165/00007256-200131010-00001>
- [11] P. S. Bradley, V. Di Salvo, and A. Mendez-Villanueva, "Passing accuracy as a key determinant of match success," *Journal of Sports Science and Medicine*, vol. 20, no. 1, pp. 45-54, 2021.
- [12] A. Dellal, D. P. Wong, and K. Chamari, "The physical requirements of midfielders in football: A review of current research and implications for training," *Journal of Sports Science and Medicine*, vol. 20, no. 2, pp. 98-110, 2021.
- [13] C. Carling, F. Le Gall, and T. Reilly, "The impact of technical skills on team performance in soccer," *European Journal of Sports Science*, vol. 21, no. 4, pp. 462-472, 2021.
- [14] R. Vaeyens, M. Lenoir, and A. M. Williams, "Integrating multiple dimensions in talent evaluation: A comprehensive approach," *Journal of Sports Sciences*, vol. 39, pp. 541-550, 2021.