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An integrative review of the game model in soccer: definition, misconceptions, and practical significance

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Abstract

Introduction. The complexity of football has led coaches to develop the game model (GM) to enhance the analysis and training of its various situations. Despite the great practical importance of the GM, this topic remains under-researched, while no relevant definition has been established in the scientific literature. Aim of Study. Therefore, the purpose of this study was to conduct an integrative review focusing on the components and practical applications of the GM. Material and Methods. Three search engines, namely Scopus, SportDiscus, and Google Scholar, were utilized. Results. After applying the exclusion criteria, a total of 17 documents were considered suitable. The review revealed a scarcity of research evidence despite the abundance of theoretical references to the GM. Conclusions. The synthesis of the findings demonstrated that the GM serves as a foundational framework for tactical periodization (TP), incorporating the coach's ideas while considering players' abilities, the club's culture, structure and objectives, and even national culture. In addition, its practical importance in performance analysis, training and competition at both team and individual levels was demonstrated. These findings highlight the value not only of the creation of a GM by coaches, but also of its correct application in practice.

KEYWORDS: football, tactical periodization, playing styles, coach's ideas, player's capabilities, strategies and tactics.

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Introduction

Football is a complex sport, in which chaotic situations arise [14]. To enable coaches to turn these situations into more controllable ones, they develop a game model (GM). It facilitates the breakdown of the game into manageable moments and sub-moments, allowing coaches to observe player positions and behaviors [37]. The GM has gained significant attention and recognition as a critical aspect of team performance. Coaches and researchers alike have recognized its potential to shape a team's playing style, tactical approach, and overall effectiveness on the field [37].

Despite its widespread use, the GM in soccer still lacks a clear and universally accepted definition. This lack of clarity often leads to its misuse, with one common misconception being its confusion with the term "playing style". Game styles (or playing styles) are also a prominent topic of study among soccer researchers [23], as their identification and quantification are crucial steps in effective performance analysis [20]. Playing styles have been extensively defined in the international literature, which describes them as distinctive patterns or behaviors consistently displayed by a team on the field [13, 15].

In the international literature there are examples of authors who do not correctly distinguish between the terms GM and game style. For instance, Jaime et al. [16] defined the GM as the characteristic playing pattern demonstrated by a team during matches. However, this definition aligns more closely with the concept of playing style rather than the GM itself. It is noteworthy that in their subsequent discussion, those authors also referred to the term

"playing style" as if it were synonymous with the GM. Considering this confusion, the practical significance of two concepts for coaches, and the absence of a literature review for components and practical applications of the GM (particularly in the English language), we have undertaken the present brief review.

Additionally, the analysis of performance in sports relies heavily on the development of operational definitions, which are essential in both academic and professional settings [38]. In this review article, we aim to provide a clear definition and a comprehensive analysis of the GM in soccer, exploring its conceptual foundations, practical applications, and impact on player and team performance. We will delve into the dynamic and evolving nature of the GM, considering factors that influence its development.

Aim of Study

By synthesizing current research and insights from leading experts in the field, this review article seeks to broaden our understanding of the GM in soccer and shed light on its practical implications for coaches, players, and researchers. Ultimately, we aim to provide a foundation for further exploration and development of the GM as a fundamental aspect of soccer practice, contributing to the continuous improvement of performance analysis.

Material and Methods

This review is based on documents published until June 15, 2023, with no restrictions on the year of publication. We utilized the search engines: Scopus, SportDiscus (from EBSCO), and Google Scholar, combining the terms "Game Model", "soccer", and "tactics" using the Boolean operator "AND". We conducted a comprehensive search across all document types, including review articles, qualitative and quantitative research articles, books, theses, and even unpublished articles that have not undergone peer review. However, we excluded documents written in languages other than English, documents that exclusively focused on developmental ages, women's or robotic soccer, and documents, for which the full text was inaccessible.

After removing duplicates, the application of the criteria was carried out in two stages. During the first stage (screening) all records that were not in English, lacked full-text accessibility, or did not pertain to adult men's football, were excluded. In the second stage (eligibility) records were eliminated if the mention of the GM was minimal (e.g., only in one sentence) or if it was solely present in the bibliographic references section. To record the gathered data, we employed a Microsoft Excel spreadsheet. For each retrieved paper we recorded the title, author's/authors' name, publication year, and document type.

Results

As depicted in the flow diagram of Figure 1, a total of 690 records were obtained from the initial search across the three databases. After eliminating duplicates and applying two-stage exclusion criteria (screening, eligibility), 17 articles were ultimately considered appropriate for inclusion in the review.

Table 1 presents the details (title, author(s), year, and document type) of the 17 records included in the study. The table reveals that 2 books, 2 dissertations, 4 review articles, 3 unpublished articles, 3 qualitative research articles, 2 quantitative research articles, and 1 research article utilizing a mixed method (qualitative and quantitative).

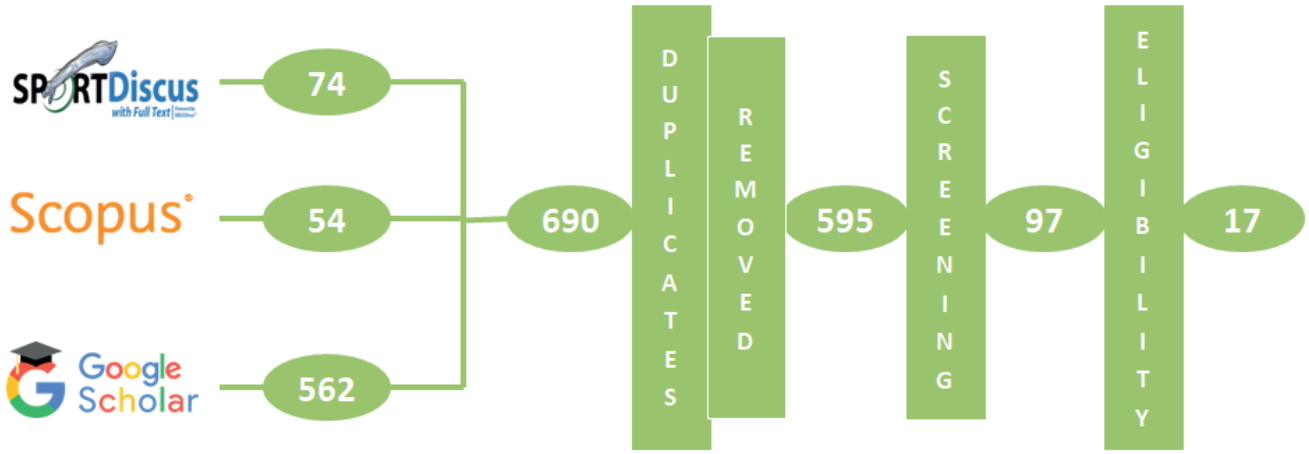

Figure 1. Flowchart illustrating the methodology and results of the search

Table 1. Title, author(s), year, and document type of the 17 records included in the study

TITLE	YEAR	AUTHOR	TYPE OF DOCUMENT
Tactical Periodization: Mourinho's Best-kept secret?	2012	Delgado-Bordonau & Mendez-Villanueva	Unpublished article
Holistic soccer profile by position: a theoretical framework.	2021	Mota et al.	Review article
Network-based centrality measures and physical demands in football regarding player position: Is there a connection? A preliminary study.	2019	Castellano & Echeazarra	Quantitative research article
The Analysis, Support and Development of Coaches' Tactical Knowledge in Practice.	2021	Walsh	Dissertation
Comparative Analysis of The Offensive Game Between Real Madrid 10/11 and 09/10 Inter Milan.	2011	Barbosa et al.	Unpublished article
Exploiting bi-directional self-organizing tendencies in team sports: the role of the game model and tactical principles of play.	2019	Ribeiro et al.	Review article
Coaching through Principles of Play. A Conceptualisation of the Coaches' Process of Knowledge.	2018	Kerr-Cumbo	Dissertation
Tactical periodization: A proven successful training model.	2018	Delgado-Bordonau & Mendez-Villanueva	Book
A systematic review of research on tactical periodization: absence of empirical data, burden of proof, and benefit of doubt.	2020	Afonso et al.	Review article
How and why do soccer coaches use small-sided games in the training process?	2017	Alves et al.	Qualitative research article
Adapting the High Chaos phase of the 'control-chaos continuum': a bridge to team training	2020	Taberner et al.	Unpublished article
Patterns of Play in the Counterattack of Elite Football Teams - A Mixed Method Approach	2017	Sarmento et al.	Quantitative and Qualitative research article
The coaching process in football–A qualitative perspective.	2014	Sarmento et al.	Qualitative research article
Soccer match analysis. A qualitative study with Portuguese First League coaches.	2013	Sarmento et al.	Qualitative research article
Tactical Principles of Soccer: concepts and application	2009	da Costa et al.	Review article
Coaching Positional Play: "expansive Football" Attacking Tactics and Practices.	2015	Basile	Book
Comparison of tactical principles efficiency among soccer players from different game positions.	2017	Rechenchosky et al.	Quantitative research article

Discussion

Components of the game model

The creation of a GM involves considering various factors, primarily including the coach's ideas, players' capabilities, the club's culture, structure, and objectives, as well as the country's culture. These factors have been extensively discussed in international literature, as evidenced by scientific articles, books and dissertations. Obviously, the coach's ideas (philosophy) are the most crucial factor in creating a GM. These encompass the principles of play [12, 19], the desired style of play for the team [8, 24, 37], systems (or formations or structural organization) [3, 12], and strategies and tactics to be implemented [26, 37]. All of these aspects are adapted to the key moments of the game [17, 37]. There are five key moments (or phases) in football: attack, defensive transition, defense, attacking transition, and set-pieces [15, 21]. With the distinction of set-pieces into defensive and offensive, it becomes six [6]. Furthermore, the attack phase can be divided into three sub-phases (or sub-moments): the build-up phase, the progressive or creativity phase, and the finishing phase. Depending on the zone the team defends, we distinguish three additional sub-phases: high-press or high-block, mid-block, and low-block [20].

Delgado-Bordonau and Mendez-Villanueva [11] clearly defined the role of game principles as a crucial factor in

constructing a GM. In fact, they categorized principles into the main, sub, and sub-sub categories based on their complexity. Principles enable a team to execute specific motor actions and patterns. The main principles of play pertain to collective actions, sub-principles pertain to sectorial and intersectorial actions, while sub-sub-principles of play pertain to individual actions. All these elements are interconnected, forming a functional organization that showcases the team's identity.

Another crucial factor in creating a GM is the team's formation, which refers to how the players are positioned on the field and is commonly referred to as the system of play. The formation is typically denoted by three numbers representing the number of defenders, midfielders, and forwards, with the addition of number 1 for the goalkeeper [10]. For example, when a team adopts a 1-4-3-3 formation, it indicates that they have one goalkeeper, four defenders, three midfielders, and three forwards. While the formation represents a static spatial arrangement, it can significantly influence and facilitate the desired behaviors of the team [12].

According to Walsh [37], the coach's ideas that determine the GM also include playing styles, strategies and tactics. In fact, other authors have argued that one of the key aspects in a coach's philosophy is the playing styles they want their teams to adopt [18, 30, 31, 39]. Playing styles refer to the patterns and behaviors that teams adopt during matches [13, 15]. Additionally, Luxbacher [18], Walker and Hawkins [36] and Zainuddin et al. [39] argued that the coach's philosophy determines the strategies and tactics they want their team to implement. The term tactics refers to specific actions carried out by football players within the context of the team's broader strategy [7].

However, in addition to their personal ideas coaches should take into account other factors when creating a successful GM. First and foremost, the coach should consider whether the characteristics of his players align with the GM he wants to create [11, 12, 17, 37]. Therefore, he must assess the abilities of his players in five areas: technical, tactical, psychological, physiological, and sociological skills [22, 37]. Secondly, the team's structure, objectives, and culture are another crucial factor. Hence, the manager needs to take into account the number of players and coaching staff members, whether the team aims to win the championship or avoid relegation, and also consider the team's culture [11]. Lastly, the overall culture of the country, to which the team belongs, can influence the development of its GM. A prime example is the contrasting styles between Brazilian and Italian, or Norwegian teams [4, 34].

Figure 2 summarizes the factors that contribute to the creation of a GM. The four main components of the GM, namely the coach's ideas, players' capabilities, club culture, structure and objectives, and even the country's culture, can be observed in the corridor. Following that, there is an extensive analysis of the coach's ideas, including principles, formations, strategies, tactics, and playing styles, which must be adapted to the key moments of the game.

Practical applications in the training process

The most widespread application of the GM is the TP. According to Delgado-Bordonau and Mendez-

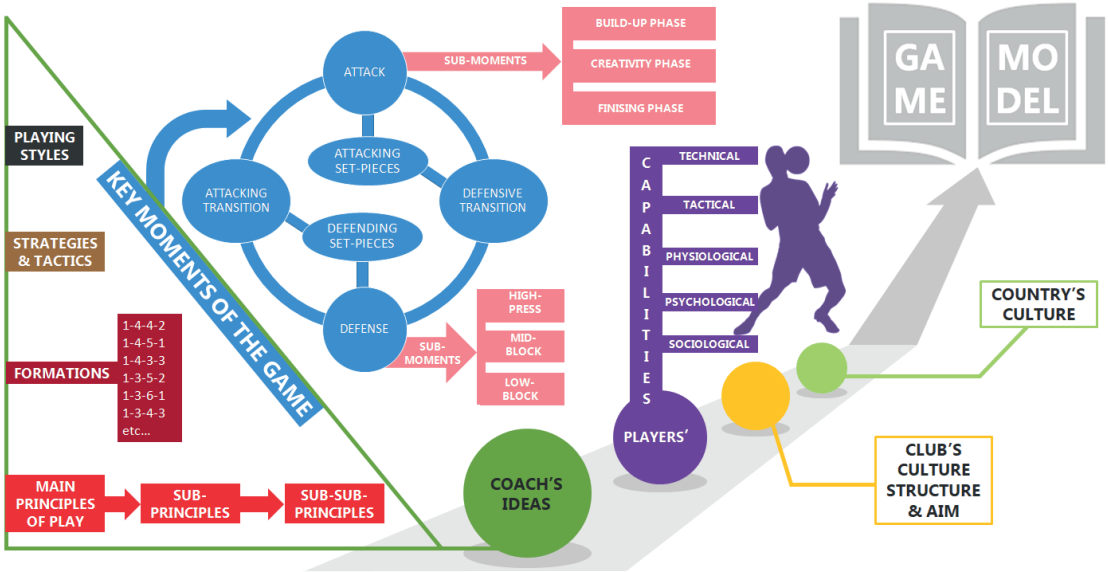

Figure 2. Factors that contribute to the creation of a GM

Villanueva [12], TP is a training approach in football that prioritizes the tactical dimension as the driving force for all aspects of the game. It revolves around the GM, which guides the training process. By aligning training sessions with the GM, TP ensures a close relationship between all dimensions of the game, including physical, mental, and technical elements.

In more detail, Delgado-Bordonau and Mendez-Villanueva [11] argued that TP emphasizes specificity, with practices designed to directly transfer the principles of play to competitive matches. It also incorporates systematic repetition to develop habits related to performance in real matches. Additionally, complex progression prioritizes the most important principles of the GM and increases the complexity of training practices as players become more integrated. The approach places significant importance on the coordination of decisions within a common tactical language, promoting collective thinking and optimal actions on the field. Successful coaches such as José Mourinho, Leonardo Jardim, Brendan Rodgers, Marco Silva and Pep Guardiola have utilized principles of TP to prepare their teams, emphasizing the construction of a specific style of play based on well-defined ideas.

According to TP, the training is structured around the microcycle, which corresponds to the training week, and aims to prepare the team for the next challenge [1, 11]. Designing practices and training sessions based on the team's style of play and GM is crucial. The coach breaks down the principles of play, creates complex actions, and fosters desired relationships and habits among the players. Weekly training patterns are designed through continuous interactions between the GM, the team's performance, and the characteristics of the upcoming opponent. However, despite its popularity TP lacks scientific evidence and research to support its effectiveness [1].

However, in addition to Tactical Periodization, there are other practical training aspects related to the GM. Alves et al. [2] found that Small-Sided Games (SSGs) play a crucial role in the evolution of the team's GM. SSGs provide dynamic and intense gameplay that enables corrections, targeted training, and the development of players' abilities and the desired GM. Furthermore, as stated by Taberner et al. [33], it is crucial for practitioners to have a comprehensive understanding of the physical and neurocognitive demands of team training and the coach's GM before implementing high chaos training phases as part of the RTS (return to sport) process. This knowledge allows for a careful and progressive reintegration of the returning player into team training, ensuring their readiness and suitability for the dynamic and unpredictable nature of the game.

Practical applications in match preparation

The performance analysis process involves observing and diagnosing strengths and weaknesses, followed by intervention to improve performance. Coaches ensure congruence between their GM and what they observe regarding their teams [28]. Understanding their own team is crucial in evaluating opposing teams [29]. The preparation phase is characterized by rigor and systematization. The observed aspects are then evaluated based on each coach's specific GM, which informs on their intervention and planning [29].

Practical applications in competition

The GM and its associated principles play a crucial role in team organization and functioning. They guide cooperative interactions and behaviors of players as they seek tactical solutions during competitions [26]. For instance, the principle of an offensive or defensive unity emphasizes the importance of understanding the game and the team's adopted GM in relation to offensive or defensive strategies, respectively [9]. Creating a clear GM enables coaches to operationalize their team's style and systems of play, improving tactical cohesion [37]. The relationship between the GM and tactical principles of play is bidirectional, as they continually influence each other at different levels of team organization [26]. The operational strategy, influenced by the opponent's weaknesses and strengths, guides the training content to maximize the team's advantage [5].

Furthermore, the GM also impacts the individual development of players. It helps players understand their roles and responsibilities, leading to improved team performance [37]. Understanding the GM can inform the development of specialized player development programs and provide theoretical and practical frameworks for training and performance periodization in different sub-phases of play [26]. The GM reduces player uncertainty and impulsive decision-making [5]. However, this does not mean that a GM should be rigid and inflexible. On the contrary, it should be flexible, allowing players to explore a wide variety of performance solutions within the prescribed principles of play [26]. Players have individual autonomy and diversity within a team, and this tendency persists even if the coach imposes a predefined GM. While actions within a team usually align, the specific shape the game takes depends on problem-solving reasoning in response to game situations and the quality of individual tactical

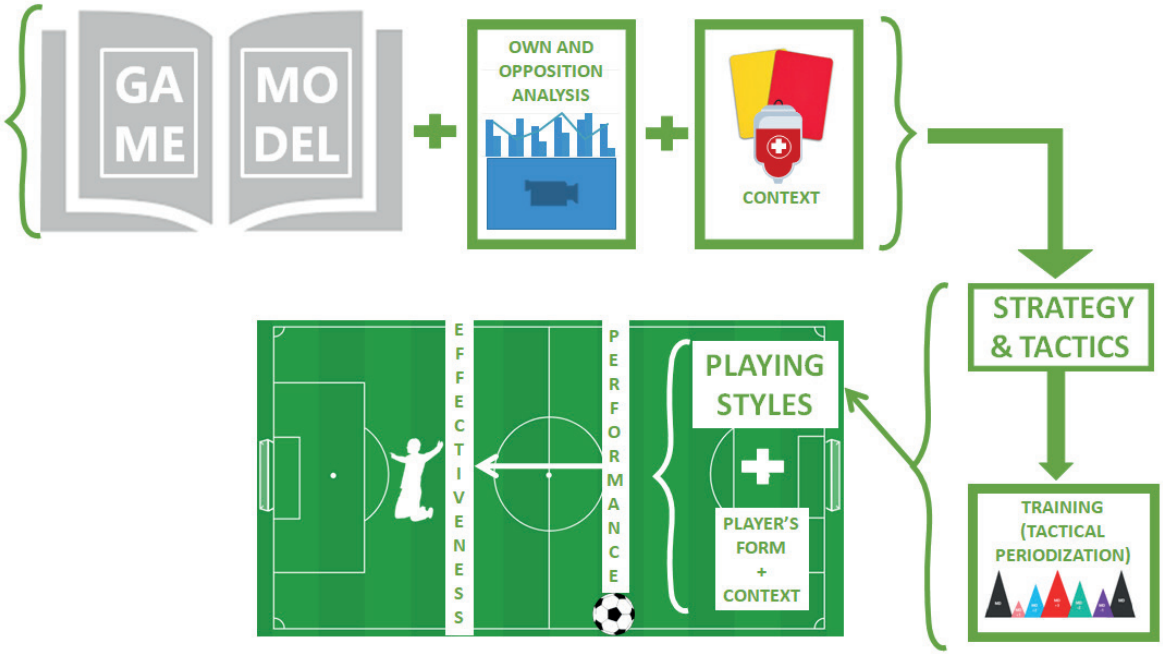

Figure 3. Practical applications derived from the GM

execution [25]. Coaches attribute the success of such teams as Barcelona to their GM, which enables effective decision-making and utilization of players' abilities [27]. The goal is to develop "intelligent performers", who are autonomous problem solvers and can regulate their actions using information [25].

Figure 3 provides a summary of the practical applications that emerge from the Game Model (GM). The coach, based on the GM, takes into account the context for the next match, such as the presence of suspended or injured players and the venue of the match. Additionally, the coach analyzes the team's performance in the previous match and assesses the upcoming opponent. This analysis guides the coach in determining the strategy and tactics to employ during the match, which are then refined during the week's training sessions. As a result, the team demonstrates specific styles of play on the field. These styles, in conjunction with the players' form and the match context (e.g., player form, opponent quality, match conditions), ultimately determine the team's performance and overall effectiveness.

Definition

Considering all the points discussed above, we present the following revised definition: "The Game Model is a framework encompassing the coach's ideas, players' capabilities, club's culture, structure and objectives, and even the country's culture. It serves as the basis for team organization, training, and individual player development, while constitutes the core of Tactical Periodization".

Conclusions

An important limitation of the present review is its reliance solely on English language records. Consequently, documents in other languages, such as Portuguese, which serves as the foundation for TP [1, 11], were not included. Furthermore, the review was not conducted in a systematic way. Despite these limitations, our review provides valuable information regarding the GM. We developed two new theoretical frameworks, which serve as the focal point of this integrative review [32, 35]. Specifically, we initially identified the factors necessary for the establishment of the GM, followed by an analysis of its practical applications in training, performance analysis, and within the game context at both team and individual levels. Additionally, a definition was extracted, which could provide a common language among football researchers. The current study could serve as a foundation for a future systematic review on the GM in soccer. Furthermore, this review revealed that most knowledge is derived from theoretical concepts (qualitative research, books, review articles, theoretical frameworks). This underscores the necessity for scientists to conduct further research on the practical applications of the GM. The two theoretical frameworks we have developed (illustrated in Figures 2 and 3) can serve as valuable tools for future researchers conducting studies on the GM.

Conflict of Interest

The author declares no conflict of interest.

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