

Integrating numerical superiority offensive actions into the game model and handball training execution

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Published online: April 30, 2025

Accepted for publication: April 15, 2025

DOI:10.7752/jpes.2025.04076

Abstract:

The game model represents the coach's philosophy, detailing the strategy designed to achieve success in a competitive environment. It includes both the tactical and strategic elements that define the desired style of play and emphasizes the development and refinement of specific skills during the training process. This study explored coaches' perceptions of the significance of the game model, particularly regarding the execution of offensive actions involving numerical superiority to achieve sporting success. The responses obtained highlight the importance of the game model in structuring and conducting training, involving all club participants. The "way of playing" is unique to each team, thus emphasizing the flexibility of the game model and its adjustment according to the characteristics of the athletes, the team's performance, and the evolution of results throughout the season.

Key Words: Attack; Game model; Handball; Numerical superiority actions; Training.

Introduction

The set of dimensions present in any confrontation between two teams (within the scope of collective invasion sports) entails a high degree of complexity. This underscores the need to transpose a wealth of behaviors, movements, and information to the conceptual plan, in an attempt to organize the training process and the communication established with athletes in the physical, technical, tactical, psychological, strategic domains, as well as others that interfere with the interpretation of cooperation/opposition actions existing at all moments of the game. Teodorescu (1984) was a pioneer in attempting a theoretical interpretation of game analysis, given the open nature of the multiple tasks, arising from its existence. In the author's view, the behavioral study of athletes allows the coach to represent models of their activity at individual, group, and collective levels, so the representation of these models will enable defining the requirements that can lead the team to success, as well as the most favorable strategies to work the team towards that goal, considering the constituents of the internal logic of the game, the characteristics and experiences of the athletes, which tend to shape decision-making and action in the game and/or training.

Competition, as a unique stage for analyzing individual and collective behaviors of athletes (Sampaio, 2000), offers a plethora of indicators to help participants understand the game, which can be outlined in 4 dimensions: (i) distinction between more effective and less effective game models, (ii) organization of the game in terms of individual and collective actions, (iii) integration of performance factors that enhance or condition offensive and defensive actions, both individual and collective, and finally, (iv) definition of more effective training strategies to operationalize the game model advocated by the coach. To these four dimensions, Garganta (2001) adds a fifth one, related to the identification of evolutionary trends in the sport, stating that game observation allows establishing comparisons that can indicate the evolution of playing styles over a certain period.

Indeed, Santos (2004) mentions that one of the great challenges posed in recent decades, both to coaches and researchers, is to decipher the configuration of sporting success in team sports games, through observation and analysis of behaviors expressed by players on the field. In this logic, we highlight the concern expressed by Ferreira and Queiroz (1982) and Queiroz (1986), in the analysis of the internal logic of the game, that is, the set of characteristics that are at the genesis of sports modalities and present them as we know them today, as well as in the attempt to improve the decision-making process, making it more conscious and grounded in the needs derived from the game itself, while trying to improve the inherent training process.

The organization of all these components as evolved and highlights the game model to which, among other senses, is attributed the conceptual framework of guidelines, principles, and rules that mobilize a team in its action framework, in a training or competition context (Castelo, 2019). Indeed, Barbosa (2019) considers the game model as a "guide" for the application of behaviors based on the synergies established between the different participants in the game, considering all the factors that condition it.

In the previous lines of thought, we understand the game model as the coach's ideology, in which the action principles by which his athletes should be guided are imbued, in compliance with the goals aimed at achieving sporting success. Indeed, the coach tries to conceptually plan the organization of his team to objectify and unify its actions, resorting to plans that facilitate their interpretation and assign logic to their specific content. The challenge will naturally be to be able to cross the structural, functional, and relational dimensions of his game model (Castelo, 2019), according to the needs and specificities of the club, athletes, and team, that is, to ensure that everyone understands and expresses a unique way of acting, guiding appropriate decision-making for the context in question.

From this need arises the training process as a systematic and repetitive act, consisting of progressive stimuli in terms of practice complexity, conducted and oriented towards the acquisition of knowledge, skills, and cognitive and motor competencies, through the implementation of exercises, tasks, and sessions with duly delineated objectives according to the principles to be acquired. Bompa's definition (1994), one of the first to establish a symbiosis between training and sport, acquires a timeless nature by revealing training as a systematic, long-term sporting activity, progressively complex, aimed at preparing the athlete's functions to overcome the imposed tasks (Bompa & Haff, 2016). It follows from this that one of the main objectives of training is to maintain the athletes' performance at the highest possible level with minimal performance fluctuations. From this principle, the temporal standardization of training derives, aiming to develop, assimilate, and acquire the concepts embodied in the game model, in a relationship between effort and recovery (Tavares & Mil-Homens, 2017). In this sense, its intelligible and adaptive nature is also highlighted, methodologically concretized for the coach himself and, above all, for athletes, about the best and most effective way to act, as a mental operation that leads to the elaboration of action plans to be executed for their subsequent realization and achievement of sporting success. If the contents and instances constitute particular characteristics of a certain modality and, consequently, of its own sports competition, the training process should be oriented towards these specificities, aiming at optimizing sports performance. It can be said that the game model constitutes the basis for the construction of the training model (Santos et al., 2011).

Moreover, the synchronization between game model and training model is a crucial requirement for sporting success, as athletes make decisions and delineate behaviors in a logic that follows a model of cooperation and coordination of individual and collective actions, culminating in the optimization of offensive and defensive processes in the game (Castelo, 2019).

Nevertheless, these concepts are neither static nor prohibitive of athletes' manifestation. Almeida (2014, p.26) states, in this regard, that "the reproduction and practical application of the game model should allow the possibility, based on the experiences gathered, of drawing new conclusions, not remaining in a closed contemplative state." For this purpose, post-interaction moments are very important, as the coach should systematically question the processes of his work and the progress made by athletes under these processes, in order to make the necessary adjustments when the results of these processes do not align with the intended ones. On the other hand, the game model cannot be reduced to the coach's ideas. According to the author, a rich game model will be one that grants players the possibility to add their creativity in solving problems that arise from the game.

As the training process reflects the tangibility of the game model (more abstract), giving it practical meaning, we believe that the ideas conceived by coaches should not be excessively formatted or preconceived. The development of a way of "playing" is not a static process, but rather an evolutionary one, open to the contribution of the coach, coaching staff, and athletes, in which different ideas and practices are considered, tested, added, and removed according to their degree of success (Almeida, 2014).

The same author (2014, p.50) argues that "the conceptualized game model requires a congruent training model, that is, to select and recreate similar scenarios that occur in competition." It is inferred that the advocacy of a game idea must be systematically and interdependently worked on in training, thus aiming at the game model as the cornerstone of the training process. In fact, constructing the training model based on the game model advocated by the coach is the practical application of the methodological principle of specificity training, a principle that, when applied to team sports, advocates for the operationalization of specific exercises to build a particular game process that promotes physical, technical, and tactical adaptations in athlete development. If the coach wants his players to be proficient in decision-making, he cannot operate in training inductive exercises with teaching methods that are disconnected from the game (Freitas, 2012).

Training thus presents an experimental nature, with actions developed in numerical superiority being a concrete example and one to which we give prominence in this study. Indeed, the aim is to analyze coaches' perception of the importance of the game model, as well as its operationalization in the training process, regarding the implementation of actions in numerical superiority to achieve sporting success.

Material & methods

The thematic focus and the study's objectivity led to the use of a qualitative approach due to its advantages, including the ability to gather information that may not be available through other sources (Santos & Lima, 2019). This involves investigating ideas, discovering meanings in coaches' actions and their interactions with their teams, acknowledging that there are multiple realities in the form of mental and social constructions,

experientially located, which give meaning to their experiences and of the world they live in (Creswell, 1998; Guba, 1990; Mertens, 1998; Tuckman, 2012). To gain insights and ideas about the issues to be investigated in the future, an exploratory study was conducted to promote a deeper understanding of the topic at hand and, simultaneously, to improve the understanding of the questions to be formulated in subsequent stages, legitimizing a smaller sample size.

Participants

Three coaches were pre-selected, working in the sports season of 2023\2024, in the senior men's divisions of clubs competing in the two main divisions of the sport's competitive system in our country. Of the three interviewed coaches, two are nationals, and one holds citizenship of a European Union Member State. Two out of the three interviewed hold the highest international technical qualification from the European Handball Federation (EHF): the EHF Pro License. One of the interviewed coaches was undergoing training to obtain the Professional Coach of Sport (TPTD) Degree III, a title to be achieved at the end of the current sports season. Two of the analyzed teams are competing in the National Handball Championship 1 (PO01) of the Senior Men's category in the current sports season. The third team analyzed in this study competed in the National Championship of the 2nd Division of Senior Men (PO02) in the current sports season.

Data Collection Instruments

As the aim was to analyze the opinions, attitudes, and representations of the participants, the interview technique was used, which, on this occasion, represents the privileged means to assess the social and emotional context of the interviewees (Santos & Lima, 2019). The semi-structured typology was chosen, with a reference guide being constructed for the asking of open questions, so that the interview did not proceed either rigidly or completely freely, while at the same time granting freedom to the interviewee to present their answers naturally and with a more informal language. The guide presented two dimensions which intended to analyze: (i) the inscription of offensive numerical superiority actions in the game model; (ii) operationalization and execution of training contents related to numerical superiority actions. Subsequently, a content analysis was carried out which, according to Bardin (2016, p. 49), is defined as "a set of communication analysis techniques aimed at obtaining, through systematic and objective procedures, the description of the messages' content indicators that allow the inference of knowledge regarding the conditions that create these messages". Content analysis is, therefore, a data treatment technique collected from conducting interviews that aims to help the researcher describe and interpret what was narrated by the interviewee, emphasizing the strengths of their narrative about the subject under study.

Procedures

Requests for collaboration were sent, by letter, to the clubs where the three coaches work, in order to also obtain the institutions' consent for our purpose. The content of the letters provided the presentation of the study topic, the framing of the methodological procedure to be applied within the study objectives, and a detailed description of the interview conditions and related conduct regarding the analysis, namely the safeguarding of anonymity and confidentiality of all participants, the choice of interview date, maximum duration and format of the interview, the request for authorization to record the interview for validation purposes, and the sending of the interview's audio file copy for validation of the study information. After the process' explanation, all participants signed an informed consent, which contained the relevant details of their intervention, thus allowing them to make an informed decision before agreeing to participate in the study. To safeguard the confidentiality and anonymity of the analyzed teams, their coaches, and the collected data, the 3 teams were coded and numbered (randomly) for this study. Consequently, the coaches will henceforth be referred to by the following abbreviations "T1", "T2", and "T3".

Results' presentation and discussion

First Category - Inscription of 7x6 Offensive Numerical Superiority Actions in the Game Model

The inscription of tactical combinations and/or special situations and its decision-making, movements, and technical-tactical actions in the collective, group, and individual scope that each athlete from each specific position should execute in a game model, transforms this model into an indispensable tool for the training process' construction by virtue of the construction of what Garganta (1997) designated as a training model, a concept also developed by Almeida (2014) or Castelo (2019).

Regarding the execution of the aforementioned combinations in offensive numerical superiority contexts (7x6), as well as the various movements, decision-making, and individual technical-tactical actions that each athlete should execute within a manifestation that could constitute a game model, we inquired the coaches for this purpose, and T3 and T1 mentioned conceiving actions in their game model. T1 stated that he included offensive individual tactics' combinations and that there is a set of group and collective dynamics sculpted in numerical superiority actions (6x5 and 7x6) that are common in his game model. On the other hand, T2 mentioned not developing these actions in his team's game model, since the actions to be carried out in moments of absolute numerical superiority (7x6) are the same to be executed in actions in numerical equality (6x6), within

the established relationships between his athletes in the context of achieving numerical superiority situations in a certain field area. Deepening T2's reasoning: *"No, these actions are not written in the game model. In fact, we do not practice 7x6 actions in training as much. In fact, we hardly ever practice them! What we actually practice are these actions in the group context, that is, in exercises with reduced numbers... (...) As I was saying, the actions we develop in partial situations of 3x2 or 4x3 in 6x6 attacks should be similar in 7x6 actions. We only feel the need to 'talk' about 7x6 and practice these actions once or twice per season."*

Given the primacy attributed to cooperation relationships among athletes, we found that this perception was also identified by Goulão et al. (2020) when inferring in their study that, in the participants' perception, the game model aims to capitalize on the development of athletes and contribute to game knowledge.

On the other hand, T1 mentioned not presenting his game model to his athletes due to less positive episodes that occurred when he practiced this in the past. We understand his option, as reading the game model by the athletes can present advantages and disadvantages. For athletes less identified with some of the work to be operationalized in training or with their coach's thinking, reading the game model can help understand, adopt, and correctly execute the behaviors envisioned in it. As the main disadvantage, incorrect interpretation of the intended expressed ideas, an error committed in its elaboration by the coach, or misunderstanding of them could undermine the reciprocal trust that all coaches seek to achieve with their workgroup. This climate of total trust is, in our view, fundamental to success. T1 also considered that, despite having the inscription of these actions in his game model, decision-making is complex because the task shifts from a closed state to an open one halfway through its practice, a transformation that gives athletes greater degrees of freedom to make the best possible decision in the scenario dictated by the Game: *"It is also important to understand that the athlete has total freedom to decide, that is, it is a task that is clearly open, not a closed task! There is no previous collective tactical action that somewhat closes the task. We train the wingman's entry without the ball, and then, we make a '9' or a 'Korea,' which is an exchange of the first line, and only when the pivot receives, does he start attacking, crossing with the wingman. Until reaching the cross with the wingman, the task is closed and it is only decided from there, but no, there are defined trajectories, there are defined behaviors, the tasks are more open."*

T1's discourse raises the question of who should participate in the construction of the game model. In this line of thought, Miranda (2009) admits the coaches' exclusive responsibility in its construction, even though together with his technical team, while Goulão et al. (2020) highlight the intervention of athletes in this process, although to a reduced percentage. Even if that is a slight discrepancy between opinions, it becomes clear that training exercises are fundamental in preparing athletes, teams, and sports seasons. As such, and according to Castelo (2019), if properly planned, they will produce positive effects that will manifest over time through better adaptation and sustainability indexes. The game model guides training (Almeida, 2014), therefore, all involved parties should be aware of the ideologies inscribed in it, so that it becomes possible to emphasize the central objective of each training exercise and, thus, build a "way of playing," characteristic and specific to each team (Quinta, 2017), alongside the development of skills for playing (Garganta, 2017).

Second Category - Frequency of Training Contents Execution Related to 7x6 Numerical Superiority Actions

In light of the response provided by T2 in the previous questions, it is perceived that the overall training situations of 7x6 numerical superiority actions, in absolute numbers, are not constituted, notwithstanding the fact that they are frequently performed by the team in a game context as a regularly operationalized content in training, but rather exercises of decision-making in partial contexts, i.e., in specific contents for decision-making in 4x3, 3x2, and 2x1 situations, equally important for these actions' success: *"We train more according to the partial method, in reduced groups, in the same way as we train 6x6 situations. However, we know that in these actions we have one more pivot... We operationalize these types of exercises a lot, like exercises where we replicate 3x2, 4x3 situations. We practice a lot of these types of exercises, which, as you know, end up being important for the development of 7x6 actions."*

The same responses assured us that there is no training session outlined in the standard microcycle or morphocycle to work on these situations in a global context: *"We work on these actions very little... Today's training was one of the rare exceptions. Usually, during the season, we play two games per week. We can't waste too much time on these actions."*

T1 stated that he operationalizes more specific contents for 7x6 with greater regularity, although he does not have one or more exclusive training sessions to do this type of actions, but it is a fundamental part of a training session. The respondent pointed out the need for these actions to be worked on in a more group context (collective game tactics), similar to 6x6 numerical equality actions and 6x5 numerical inequality actions: *"They are regularly, whether in specific 7x6 training or in group tactical training, let's say, 3x2, 2x2, 2x1, 4x4... I used it much more as work in the central defense zone, but up to 3x2 clearly. In the microcycle, just to train 7x6, no, but to train... to dedicate 45 minutes of the main training trunk to work on 7x6, yes. We often work on 2x1 and 3x2 for finishing, but also with the pivot open on the right side, with the pivot closed on the left side, which somewhat encompasses what our 6x5 and 6x6 are... and as the right back decides with the open pivot, the left back decides with the closed pivot, 'with the pivot in 2/3 or with the pivot in 1/2.'"*

On the other hand, T3 responded affirmatively to all questions asked within this category. In his team, offensive numerical superiority actions (7x6) are regularly performed in the training process, with the planning

of a specific training session in the weekly microcycle. The exercises are carried out within the partial method, although he also favors the performance of game situations and more individualized exercises, especially for the development of the goalkeepers' capacities that are intended to be seen in defending against this type of situation.

The obtained responses refer to the plasticity of the game model, that is, to its ability to readjust based on the athletes' characteristics, the team's performance, and the evolution of results throughout the season. Bettega et al. (2018) argue that the game model cannot be rigid but rather approximated to the athletes' development patterns, since their behaviors may vary over time and according to the variability of game principles. In this regard, all participants in Goulão et al.'s study (2020) responded positively to the question of the game models adaptability, even emphasizing the change in the "way of training" if necessary. Marques and Oliveira (2002) advocate for continuous multilateralism and transformation of training exercises, as competition stimulates the performance of sports actions that demand constant adaptations and through which athletes' neuronal and muscular systems develop.

Conclusions

The game model, when centered on the athlete, serves as a didactic training plan aimed at highlighting physical, technical, and tactical skills, as well as decision-making and autonomous learning, subsequently executed in the daily competition routine. It aims for active participation, both individually and collectively, where each athlete contributes their own conception of team play and develops relationships of value with their teammates, respect for others, recognition of being an integral part of something greater than themselves, and the establishment of group dynamics both within and outside of competition, in training context or purely social settings.

The importance of the game model and its vertical interaction with the training model is emphasized as a learning facilitator of the skills required to achieve sporting success. In this context, it is required that actions in 7x6 numerical superiority be included as a target content in the sports season planning, embedded in the game model, and operationalized in all dimensions of sports training so that athletes can acquire skills for their practice. These actions take the form of offensive tactical, individual, and collective combinations, developed within numerical superiority situations, and in the specific cases of the formations guided by the interviewees, derived from tactical combinations already operationalized for situations of numerical inequality 6x5 and numerical equality 6x6, with the additional advantage conferred by the presence of a second pivot in the second line. Although there is reference to the operationalization of exercises according to the global method, the partial method is most commonly used by coaches to operationalize decision-making in 7x6 actions. Training decision-making in reduced-number exercises (4x3; 3x2, and 2x1) in the side corridors is one of the most practiced contents by the interviewed coaches.

Lastly, although there is a record of these combinations in the game model, communication errors leading to false interpretations by the athletes regarding the ideas advocated by the coach result in them not being presented to the athletes. Therefore, there is a need for the tasks performed in these actions to transit from a closed state (such as crosses or permutations) to a more open state in decision-making, granting athletes freedom and creativity in creating finishing situations. However, the operating principles outlined in the game model do not foresee the practical adoption of standardized movements, thus it is up to the athletes to perceive the environment presented in each specific action in terms of opponent positioning and movements, to adopt behaviors that most easily allow the pursuit of game objectives.

Despite the caution required in the inferences stated, limited by the sample size, we believe that the perception of how these variables manifest in the behaviors of coaches forms a strong foundation in improving training programs, the development of practice, and the decisions made by coaches during the game.

Acknowledgments

This work is funded by National Funds through the FCT - Foundation for Science and Technology, I.P., within the scope of the project Ref^a UIDB/05507/2020 and DOI identifier <https://doi.org/10.54499/UIDB/05507/2020>. Furthermore, we would like to thank the Centre for Studies in Education and Innovation (Ci&DEI) and the Polytechnic of Viseu for their support.

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