Original Article (short paper)

Teaching handball to players under-12: the perspective of Brazilian coaches

Rafael Pombo Menezes[1*], Renato Francisco Rodrigues Marques[1], Myrian Nunomura[1]
[1]*Universidade de São Paulo, USP, Ribeirão Preto, SP, Brazil*

Abstract — Aims: To reveal the pedagogical principles adopted by Brazilian coaches in teaching handball to the under-12 teams (U-12). **Methods:** The sample included six coaches with extensive coaching experience, whose reports were collected through semi-structured interviews. The data were treated and analyzed according to the Collective Subject Discourse (CSD) method. **Results:** The results indicated a preference for game-centered approaches (CSD1), as they offer a complex environment in which distinct game skills can be developed (such as perception, attention, anticipation and decision making). To a lesser extent, coaches indicated their preference for teaching coordination exercises (justified by the maturation changes that take place during this period), and even less for the technique approach. **Conclusion:** Based on the coaches' perspective, games must be a central element to teaching U-12 teams, which permits the development of different aspects involved in decision-making during handball.

Keywords: team sports; youth sports; sport initiation; sports coaching; coaching.

Introduction

Team sports players' development has been discussed worldwide in the last decades by scholars of different fields of research[1-4].

Handball, a traditional team sport of a complex nature, presents different relationships between teammates (cooperation) and opponents (opposition). These relationships are directly related to the offensive and defensive principles, which are common to other invasion games (like futsal, soccer and basketball). The offensive principles are related to keeping the ball, and to exploiting and creating available space to score; and defensive principles are related to challenging the opponent's progression, regaining the possession of the ball and defending the target[5].

There are pedagogical similarities in teaching invasion games. Some contents are important within this complex context of the game, such as skills, specific technique, tactical schemes (offensive and defensive) and individual tactics (offensive and defensive). Assuming that the tactical elements can be transferred between invasion games, handball can be taught based on different games considering their similarities[6].

Traditionally, literature has drawn attention to two main teaching perspectives: a) teaching-learning process based on the technique approach (in a technocratic way), and b) those that emphasize the game context with its dynamic and complex decision-making[7-11].

Some authors[4] are concerned with teaching through games and game situations in complex contexts (such as Teaching Games for Understanding - TGfU). The emphasis on tactical aspects is more coherent within the context of handball for prioritizing aspects such as decision-making and creativity, which are not contemplated by the technique approach[12].

The complexity of team sports is not restricted only to game scenarios (i.e. players skills, players moves or tactical choices). Coaches are also involved in a complex context with aspects that influence their decisions[13], such as the interaction between different actors[14]. Coaches play a determinant role in the team context and in the players' activities, specifically considering the content distribution and the teaching approaches[15].

The aim of this work was to investigate Brazilian handball coaches' perspective on technical-tactical contents and the main pedagogical approaches to teaching handball to under-12 teams (U-12). Specifically, the goals of this study are to: a) identify the main approaches used by coaches in a specific Brazilian context (the state of São Paulo); b) discuss the coaches' reasons for their pedagogical approaches.

Access to the coaches' information permits the unveiling of strategies and procedures used in the pedagogical process and the clarification of their work procedures in team sports, such as handball[16]. Therefore, the intent is to reveal the pedagogical goals and procedures adopted in the training sessions of U-12 handball teams. To reach this goal, we collected and discussed the discourses of Brazilian handball coaches.

This article begins with an overview of the organization of handball in Brazil, specifically in the state of São Paulo, which is necessary to characterize the coaches' environment and their possible choices for teaching approaches. We then present, in the theoretical framework, the TGfU approach. In the next session, we present the methodological decisions. Next, we discuss the perspective of Brazilian coaches (of the state of São Paulo) about the fundamental contents and pedagogical approaches of U-12 handball teams.

Handball context in Brazil and in the state of São Paulo

Handball is a sport practiced worldwide, and Brazil has shown significant results at the international level, finishing in first place in the 2013 Women's World Championship and, for the first time, the men's team played the quarter-finals at the 2016 Olympic Games.

In Brazil, handball is managed by the Brazilian Handball Confederation (CBHb), which centralizes decisions, organizes national competitions and national teams. In Brazil, there are

27 State Handball Federations (one for each federative unit), which are affiliated to the confederation.

CBHb does not organize competition or systematic events for U-12 teams, which is the responsibility of each federative unit. On the other hand, the São Paulo State Handball Federation (FPHb), as well as other Federations, annually organizes regional competitions for U-12 teams, with the participation of eight men's teams and six women's teams in 2017. Still considering the São Paulo context, there are at least five regional leagues (without connection to the FPHb) that were created to promote competitions at lower costs, bringing together surrounding cities, promoting festivals (with multiple games on the same day) and competitions six months per year.

In Brazil, coaches need to have a degree in Physical Education, which is a requirement for professional practice according to the Federal Law 9696/1998[17]. Milistetd, Trudel, Mesquita, Nascimento[18] point out that the academic preparation for coaches can be described as a comprehensive in so far as it does not specialize in one single sport. Another aspect that we highlight is the plurality of sports expressions in Brazil regulated by Federal Law 9615/1998[19]. This law extends the field of research coaching, mainly because there is a historic closeness between it and the sport pedagogy in Brazil[20].

After graduation, the coach usually starts coaching with beginner levels (such as U-10 and U-12). After a period of time, and depending on the structure of the place where he/she coaches, the coach starts to have opportunities with other teams (such as U-14, U-16 and subsequent ones). In this scenario, it is common for adult team coaches to have experiences with teams of other ages, with the expectation that these coaches will understand the long-term teaching process.

Teaching Games for Understanding

Studies assessing the effects of different team sport teaching approaches, whether through the technique approach or new pedagogies (based on tactical approaches), have been important in many sports involving Brazilian children and youth[16,21,22]. In this study TGfU is the theoretical framework in which the coaches' reports are discussed.

Traditionally, team sports have been taught based on technical/skills approaches in a positivist way, which do not consider the complexity of the games' environment and fail to explain the contextual nature of these games to players[23]. Another characteristic is the main position assumed by skills development and its automatic application in game context[24]. Teaching based on game understanding gained notoriety in the sports context due to its counterpoints to the technique approach, as an alternative to the historically established paradigms[4,15,25-27].

However, this finding is not only based on the fact that the pedagogical approaches are diametrically opposed, but also on the practical implications for players in the complex technical-tactical scenario of the game. The complex context of team sports, in which the game scenario changes dynamically, reveals the importance of players' decision making[5,12,28], who need to solve a large number of problems related to the interactions with teammates and opponents[29].

Memmert and Harvey[26] indicate that teaching approaches based on games (tactical approach) were developed due to the dissatisfaction with the technique approach, which was based on learning the movements prior to play. These technique-centered approaches denied the importance and understanding of the tactical nature of the sport and taught the technical elements in a context that did not consider the requirements of the complex and unforeseeable relations of cooperation and opposition of the game[7,9,30]. Moreover, they culminated in the lack of transfer of skills acquired from the training to the game environment[31].

To be able to appropriate decisions making into the game, players need to combine some attributes, such as perception, attention, memory, and the anticipation of their teammates and opponents' possible movements in the dynamics of the game[4,28]. Gréhaigne and Godbout[5] indicate two aspects that players should manage: risk taking to gain advantage or executing a safer strategy to maintain the stability of the system (and leaving the initiative to the opponent). The development of those aspects might be influenced by coaches' choices of teaching approaches.

One of those approaches, called TGfU, has been designed to develop tactical knowledge based on games activities and situations. Werner, Thorpe and Bunker[4:28] argued that this approach "stresses the importance of the game, tactical awareness, and decision making", in which the learner is placed as the central element. The TGfU approach is focused on developing learners' abilities to play and respond well to different games[8], and was presented as an alternative to the technique approach to teach team sports.

Four fundamental pedagogical principles constitute the TGfU approach: sampling, modification-representation, modification-exaggeration, and tactical complexity[27]. The principle of sampling assumes that games should provide a variety of experiences to players[27]. It is possible to highlight the similarities between apparently different games, which can lead to the transfer of concepts, mainly in relation to its principles and the players' action rules[5]. Sampling is at the center of the TGfU approach, and the classification of games pointed out by Werner, Thorpe and Bunker[4] facilitates the integration of those with similar tactical possibilities.

The principle called modification-representation highlights that games are developed from the same tactical structures of the adult game, but are adapted according to age and height, for example. In other words, "games can be modified to be representative of the advanced game form"[3:215], and players might be exposed to situations in which the development of tactical awareness and the practice of skills are sought. However, only mini-games can lead players not to learn the adult game, which justifies the principle of modification-exaggeration[27]. Learning takes place in authentic contexts because it is embedded within games or game-like activities that are modified to reduce skill demands[23], encouraging players to engage in cognitive play[27] to solve "tactical problems encountered within the game"[3:216].

The third principle, modification-exaggeration, describes that although mini-games allow children to create associations with adults' games, solutions for their tactical problems can be difficult. Thus, after learning the primary rules of the formal game, it becomes possible to introduce secondary rules to emphasize some specific tactical problems[27].

The premise pointed out by the second and third principles are relevant as they submit players to the game environment or its different situations (which remits to the TGfU[4]), and does not take place when the technique is executed beyond that context (prioritized by the technique approach).

The fourth principle, called tactical complexity, is based on the idea that the teaching of games must be done in increasing complexities, with target games being presented as the first step and the invasion games (like handball) as the last step[4]. There is a close relationship between this principle and the modification-exaggeration, because when a game is presented in its complete form, it may be extremely complex for the learner, but it can be tactically simple by exaggeration[27].

Methods

Jones and Thomas[14] argued that coaching is a social and non-linear process influenced by the interactions between different actors. They also presented a metaphor of coaching as a 'scaffolded practice', which considers coaching as a complex pedagogical system influenced by socio-cultural aspects.

A qualitative research approach was chosen to gain understanding of the handball coaches' experience in the teaching process in U-12 and the main reasons for their methodological decisions. To get that information, semi-structured interviews were conducted with coaches[32]. The initial premise was the access to the coaches' thoughts about players' development, which would reveal the possible pedagogical procedures that the interviewed coaches adopted in U-12 handball teams.

Participants

The group of participants consisted of six Brazilian handball coaches (called C1, C2, C3, C4, C5 and C6), with a mean age of 42.7±6.4 (min=31, max=49) years old and an average professional experience of 18.0±5.9 years (min=13, max=28). All coaches hold a Physical Education degree (which is a requirement in Brazil to coach[20]) and some also practice continuous education in different areas, such as sports training, sports marketing and educational sports. The interviewees signed an Informed Consent Form previously approved by the Institutional Research Ethics Committee (CAAE: 18016013.0.0000.5407), safeguarding their identity.

The participants' selection criteria considered the amount of experience on teaching different ages (including U-12 teams), the fact of currently coaching senior teams and have already being classified their main (adult) team at top three of the "Jogos Abertos do Interior" of the state of São Paulo (Brazil). This competition joins the teams classified in the eight regions of the State, which are distributed between the 1st and 2nd divisions, with approximately 12 teams in each one. The outstanding position taken by the state of São Paulo in the Brazilian handball context is notorious. In 20 editions of the Brazilian National League, the State clubs were champions 15 times and runners-up 8 times, evidencing hegemony in the Brazilian handball scenario[33].

Interview procedures and speeches analysis

Coaches were contacted via phone, email and social networks. All interviews were conducted and recorded at workplaces indicated by coaches. The transcripts were sent verbatim to each coach for their consideration, and to maintain the validity and reliability of their speeches.

After the transcription, the discourses were organized according to the Collective Subject Discourse (CSD) method. This research method was developed at the end of the 1990's, and is based on speeches, in which the results are presented as a discursive opinion on a collective scale[34].

Lefèvre and Lefèvre[35] observe that the CSD is based on open and discursive questions, applied to the target subjects of the study to collect their opinions and thoughts on a given topic. It also involves different operations applied to the individual speeches that culminate in the collective discourse, which is constructed based on literal excerpts from the most relevant contents of different testimonies with the same meaning[34]. This method preserves the discursive nature of the opinions and the similarities can be shared and joined in the same synthesis-discourse. Hence, it is presupposed that the individuals who are part of a certain social group do not necessarily share similar ideas, which would cause disagreements regarding certain precepts and procedures.

The CSD reveals different categories of thoughts in the sample studied, despite discussing the same theme. These distinct forms of thinking take the form of distinct discourses, and each one is named CSD and receives a specific label. Hence, the similar ideas can be identified and reconstructed, starting from an inductive base, in view of a set of individual discourses and obtained through open questions, in which each CSD joins and articulates the different arguments of a certain opinion. Thus, the discourse of the collective thinking can be preserved, ranging from the elaboration of the questions to the presentation of the results.

The CSD method consists of the following methodological figures[34,35]:

> a) Key expressions (KE): are continuous or interrupted excerpts of the discourse that need to be selected because they reveal its essence. Aimed at selecting only what is relevant and maintaining the literal essence of the discourse being analyzed. These reveal what the interviewee "said";
>
> b) Central ideas (CI): name that reveals and faithfully synthesizes the meaning of each set of KE and permits the reduction of the multiple meanings of the discourse. These reveal what the interviewee "wanted to say";
>
> c) Collective subject discourse (CSD): combination in a synthesis-discourse, in the first person singular, of the KE with the same CI. Expresses the collective reference of the discourse, as it is produced on behalf of that group (or collective subject) which is directly expressed, in this case, the experienced handball coaches.

Thus, the goal is an expression of a community (or group's) thinking, based on the combination of isolated excerpts of individual discourse, maintaining consistency with each part that composes it.

Findings and discussion

The production of the CSD from the coaches' speeches allowed the identification of the main approaches used to teach handball to U-12 teams. Each CSD will be presented in full (with the source of the speeches overwritten), and will be followed by the specific discussion.

Coaches were divided in three groups: a) coaches who support the teaching-learning process by the TGfU approach perspective (C1, C2, C4, C5, C6); b) coaches who also address coordination exercises (C1, C2); and c) coaches who emphasize exclusively the technique approach (C3).

The analysis of the results reveals that most coaches acknowledge the importance of the game-centred approach in U-12 handball teams, as indicated in CSD1 (including discourse C1, C2, C4, C5 and C6). In CSD1, coaches evidenced the benefits of teaching handball based on games, besides offering a variety of sports to the players, and those which are related to TGfU principles.

Initially, the concern is related to the efficacy of the players' actions, like players who think of making the best decision for their team in a game situation, regardless of the technical gesture that is to be executed:

> Working without the importance of the gesture technique, but thinking about the gestures application and never about the technique of the gestures[C1]. I think that you have to present the technical gesture for they, but if they use the wrong way but effective, you let them; but if it's a wrong technical gesture and not effective you correct them[C4].

The technique employed, however, should benefit their team in action rules like keeping the ball, playing in movement, exploiting and creating available space and uncertainty[5].

In general, it is considered that handball should be taught based on a large group of games[36], whose modifications in terms of time, place, number of players, and targets should promote the learning of the basic elements in order to play with action rules, as mentioned by Gréhaigne and Godbout[5]. Also in CSD1, coaches indicate that the practice of different games can provide cognitive support aimed at transfering to formal game situations, being that the basic premise is problem solving:

> "In the U-12 team it's playing, with games and playfulness[C1,C2,C4,C5,C6], playful work is very important to the development of motor aspects of the child; I think that you have to work on that in the beginning not only aiming for handball[C6]. I believe that the content is based on the handball games group[C1], that you can work with other balls and other sports[C2]. I think the teacher has to follow the student's interest[C5], but you need a lot of games[C2,C4,C6] because there's a content you want to teach, and I think that provides a very rich education in the cognitive part[C2] and in general[C6]".

> "Teach based on games, with variations and adaptation when you perceive that it's difficult or easy[C1], always using activities and games that children are able to do[C5]. At the U-12 we mix a bit, from 0 to 10, 90% in the same sense, games, situations, intensify the handball per area[C1]".

> Coaches' speeches revealed a preference for the TGfU approach principles, and it can be possible to identify its pedagogical principles described previously[27]. CSD1 also revealed that coaches adopted this approach to emphasize participation in the sport, appreciation of the handball game, and the understanding of the game environment and its situations. Coaches said (in CSD1) that the focus of this approach is on tactical development, and that technique has a lower priority, emphasizing the effectiveness, and not the 'perfection' of the movement.

Tactical creativity can be trained and developed through motor skills that are not specific to handball[9], but may be transferable between invasion games[4]. This fact offers support to solving problems that emerge in the constant modifications in the environment of the handball game[29].

Different authors[36-39] indicate this premise because of the possibility of transferring the learning of tactical issues, mainly due to the common principles of invasion games[4] and the similarities of game problems in invasion games, which are influenced by the relations of cooperation and opposition. Garganta[40] indicates the need to transfer the aspects manifested in competition/matches to the training situations, which can be achieved based on principles of modification-representation and modification-exaggeration of TGfU.

Players are subject to different situations in the game that accepts multiple solutions, and should explore the environment to detect their possibilities of action and decision-making[41]. Teaching through games allows the players to think about the game in order to try and to take advantage of their opponents, enabling them to make decisions that respond to the requirements of the game in a continuous development and assessment process of their decisions[7].

For players, understanding the tactical elements of the game is complex and it needs to be made feasible through progressive stimuli[7], and adjusted to the practitioners' characteristics[42]. This fact justifies the concern of the coaches in CSD1 with the different games and plays that do not specifically involve handball elements, but which emphasize the efficacy of the technique in the game context. It is important to highlight that the games in different contexts, which vary in space, time and number of players, for example, aim to present these players with several situations, in which they need to make their decisions based on the possibilities their partners and opponents offer. Therefore, modified rules are used in these games, so as to present the former rules of handball later on, when the players are already familiar with and able to use them as a whole, which refers to the precept of the tactical approach[7].

In a study with soccer players[43] which applied and rated the systematization of teaching exclusively through games, the authors identified the manifestation of tactical capabilities in four times, and reported that teaching through the games approach promoted improvement of the tactical capabilities of the players during the offensive and defensive phases of the game. These results indicate the importance of complex environments for teaching team sports.

The games' environment offered to the teaching-learning of U-12 handball is filled with problem-situations that demand players to choose a response. This environment, that is rich in diverse interactions, is important for the players to construct their way of thinking and position themselves critically to achieve the

proposed objectives. Thus, the requirements in this environment need to stimulate the players to position themselves intentionally, an objective the coach should cover in the elaboration of the training session activities.

We observe in CSD1 that coaches consider the learner to be at the center of the process, as proposed in TGfU[24,27]. Thus, to provide an environment for the learners' development, coaches also revealed the need of games modification to enable the teaching of different principles that children are able to do.

Two coaches (C1 and C2) point out that, despite using the strategy of emphasizing aspects of coordination, the proportion in comparison with games is very low, estimated at about 10% of the total training time (C1). In CSD2, it is perceived that besides the importance of game-based teaching (tactical approach), the approach of coordination aspects (related to the multiple and rich development of movements, adapted to the situations)[44] is another object of concern, justified by the maturation and growth period of the players in this age range.

> A bit of line is going to appear, because we're going to work with coordination[C1,C2], work a lot of rope jumping, arches, stairs, jumping and moving along the cones[C1]. Ten percent of activities from coordination exercises will appear, involving somewhat more complex tasks, with more difficulty[C1], and you can do circuits and work the coordination using the ball, not using the balls, several balls, and not just the handball ball[C2].

DSC2 consisted of two coaches' speeches (C1 and C2) who had expressed their preference for the TGfU approach in DSC1. In DSC2 we cannot disregard the importance of coordination aspects, but considering that games require great player concentration and attention, as well as movement/skill adaptation, to problem-solving.

It makes sense to think about the importance of motor coordination aspects in game-specific tasks or small-sided games, and not necessarily in a lot of specific exercises without game application and context. This kind of training session may be boring for players, as is the technique approach, and does not motivate their desire to play.

In contrast to TGfU, CSD3 describes the preference for the technique approach exclusively in the sports initiation stage, specifically for handball, based on C3 speeches.

> Teaching for the U-12 team is more technical; I can already start teaching all types of passes, first stopped and then moving, with the opposite leg to enhance the dynamics; work a lot of grip exercises to improve even when you're going to execute the pass[C3].

The technical approach, privileged in CSD3, starts from different premises as those addressed in CSD1 and in CSD2 and emphasizes that the teaching of the technical elements, with well-defined progressions, such as from easy to complex, from the simplest to the most complex movement, mainly paying attention to the passes. The idea presented in CSD3 presupposes the learning of different types of passes without opposition, one on one with a teammate, in a context alienated from the situations and without the pressures the game imposes. Hence, it is only after reaching a certain level of technical performance that the player will be capable of playing well. Although, Werner, Thorpe and Bunker[4] pointed out that tactical awareness must not wait for the development of standard skills.

CSD3 expresses the need to learn handball based on the technique approach with systematic repetition of movements. The idea is that players would have contact with the game itself only after a successful learning process of technical skills. Thus, the learning of tactical-related elements happens subsequent to the mastery of technical skills, the latter being taught with progressive difficulties[7].

This approach, mentioned by C3, is characterized as teacher-centred and focused on the execution of motor skills, which leads to the development and refinement of these skills beyond the game context, so as to repeat the movement model executed by the teacher[15,45]. Some criticism of this approach is given, such as the non-transfer of the techniques practiced in an isolated context to the solution of situations that emerge in the game[4,7]. Other criticisms are related to the low motivation of players[4], and to the non-development of decision-making skills, because the players do not understand when and why to use the technical skills[45]. In the context of handball, and in other team sports, the technique approach may develop some skilful players, but with poor decision-making capacities, as argued by Werner, Thorpe and Bunker[4].

In this approach, techniques are presented and emphasized as skills development outside the game context, in an environment that fundamentally does not motivate the players[4,8,10,15,25,46,47]. Other arguments are provided as weak points of the technique approach, such as the reductionism of the complexity of the game environment to the sports techniques and the search for short-term results[29]. Thus, the fact that players' understanding of the purpose and subsequent application of the contents learned are not made a priority[36, 48], hinders the transfer of learning to the game context, moving away from game principles[7].

Team sports are characterized by their complexity and are derived from the confrontations of antagonistic and simultaneous objectives, with unforeseeable and random behaviours of both teams' players. Due to this fact, the technique approach privileges the reductionism of the game based on the premise of more controlled situations that, at the same time, remove the context and characteristics of the actual game environment[39].

Considering the CSD3, we think that the technique approach is not justified in U-12 handball teams, because it provides poor stimuli in relation to the complexity of the game. The domain of specific techniques also is presented in TGfU, but its emphasis occur only after the learners "sees the need for a particular kind of skill"[4:29]. In this way, the technical development is less important than tactical skills in U-12 teams, as it is necessary to develop a taste for sport (playing the game) and decision-making skills.

Gréhaigne and Godbout[5] point out that the need to develop motor skills before engaging in the game would further emphasize the motor skills when compared to the tactical aspects and the understanding of the game environment. On the other hand, the appropriate development of technical skills is essential for the players to become good players[7]. However, they need to understand that the game scenario is complex and dynamic and requires adjustments in the movements in order to achieve offensive and defensive goals.

It is important to develop the technical elements for the purposes of training and specialization in handball, as the demands at the top level rest on the players' efficacy during the different phases of the game. On the other hand, the U-12 team is at a stage in which the players need to experience different game forms and contexts that are playful and challenging, considering their non-specialization in an early stage. In that scenario, it seems a mistake prioritizing technical teaching in this phase of the teaching-learning training process in detriment of tactical teaching, as concerns should be focused on a wide range of experiences, in accordance with different authors[15,36,39,42,49].

Based on the coaches' discourses, which indicated preferences for the tactical approach (C1, C2, C4, C5 and C6) as well as the technique approach (C3), the importance of both elements should be considered, but not necessarily with the same level of importance in U-12 teams. Gray and Sproule[45] observe that the coaches' role is to select specific tactical problems so that the players can actively select and develop the most appropriate motor responses to the situation imposed. Thus, there is an implicit need to learn the tactical elements of the game, so that the techniques are initially manifested according to the context that is presented.

Although different authors mentioned earlier constitute a movement in favour of the TGfU approach, which indicates good development of the understanding of games' situations, a discourse like CSD3 is observed, in which the technique approach is the main aspect of the U-12 teams. Thus, the different criticism against the technique approach, which do not consider the child's desire to play, seem to make sense when considering the adaptation of the technique to the game situation.

Corrêa, Silva and Paroli[50] investigated the influence of four sports teaching methods on youth futsal (with a mean age of 12.6 years) regarding different variables (decision making, execution of skills and support), and based on the Game Performance Assessment Instrument (GPAI). The pre and post-test results also indicated that, for boys, there were no differences in any of the variables analysed. On the other hand, for girls, the technique approach revealed improvements in game involvement, while the other methods indicated improvements in game involvement, decision making index, skills index, support index, and global performance.

Morales and Greco[21] studied the effects of three pedagogical proposals on the development of tactical knowledge in 40 basketball players between 10 and 12 years of age. The results indicated that the proposal based on situational and global methods improve players' tactical intelligence. Contrarily, the technique approach was not an interesting alternative, because it did not allow the development of tactical knowledge.

The results of these studies suggest that the development of different players' skills is strongly influenced by an environment in which the use of tactics plays a paramount role and it is related to active teaching proposals. Most of the interviewed coaches, and based on the expression of CSD1, point out their preference for the tactical approach (game-based teaching), mainly when they suggest experiences in different sports and players' non-specialization in this age range. Therefore, the coaches need knowledge about the teaching approaches that prioritize tactical elements, in which the players are considered the central elements of the teaching-learning process, and whose environment permits critical and intentional decision-making.

The knowledge about different teaching methods and specific sport contents is important, mainly with regard to the optimization of communication processes[51], regardless of a game or an activity that involves coordination. During the execution of the game, coaches indicated in CSD1 to teach U-12 handball is the fundamental role of establishing targets related to the game skills (perception, attention, anticipation and decision making)[28] and the specific principles of the offensive and defensive phases[5].

Memmert et al.[12] suggests that is not easy to implement game-centred approaches. In Brazilian context some coaches held degrees in Physical Education where the curriculum emphasized the technique approach (the historic context was discussed by Matta, Richards and Hemphill[52]) in all of the sports stages, is possible to contextualize the opinion of CSD3, without agreeing to this statement.

The preference for TGfU by the coaches might be justified because it offers an environment with different stimuli that approximate the reality of the game. These stimuli can (and should) be adjusted according to the players' characteristics (e.g. modification through representation and modification through exaggeration) and should also be culminated in the development of different capacities required for the game. In this context, teaching through TGfU can develop general principles, like spatial awareness, width, and depth, required in different sports[12]. The specific skills for the development of handball include the game experiences, as verified by the intensity of the interviewed coaches' positions.

In the TGfU, players adjust different technical elements in an attempt to solve problem-situations that are presented. The fact that most of the interviewed coaches do not choose the technique approach is related to the players' possible specialization while still in the initial stage, which reveals the concern with wide-ranging experiences in complex contexts, and as is the case of games. In such context, different technical elements can be emphasized, such as specific passes or reception of the ball, but in a way that permits its development and application in game context.

In the course of the teaching-learning process, the variety of the functional aspects of the game, such as the environmental requirements, the individual pressures, and the nature of the tasks should be emphasized, allowing the involved players to discover and explore the rich environment of the game[41]. So, TGfU allows the players to expand their repertoire of motor and cognitive skills, which can give rise to different problem-solving (decision making) possibilities.

Teaching handball players in the initial categories should privilege the diversity of techniques, aimed at developing tactical skills related to the questions that emerge in the context of the game[44], and which favour the players' critical positioning through their decision making, in addition to the motivational and social-affective aspects involved in these practices.

Following the reasoning above, and based on coaches' discourses and literature, we suggest that TGfU is more relevant than technique approach (mentioned in CSD3) for teaching

handball to Brazilian U-12 teams (in the state of São Paulo), , based on complex context for players. Games are proposed "as a challenge to the players for an integrative development of their game understanding, tactical consciousness, decision-making processes, and techniques' execution"[12:354]. Players will be encouraged to make decisions in the game that in the long run will present different technical, tactical and understanding demands of the relations between the players. It is hoped, therefore, that it will be able to develop players that identify and solve the problems presented by the game. The technical approach choice is not a coherent option when we consider the context of the game and its poor ability to develop the skills related to decision-making and creativity.

In U-12 teams, the coach plays a determinant role, as the management of the objectives that consider the players' characteristics should be taken into account to provide the widest possible range of stimuli. The choice of the tactical approach demands constant adjustment of the game environment from the coaches, so as to permit the emphasis on different tactical elements deriving from the interactions between players from the same and the opponent teams, and to consider the offensive and defensive principles.

Conclusions

After the analysis of coaches' discourse and specific discussions, TGfU is considered a central approach in the teaching-learning process in the U-12 teams, mainly highlighting that TGfU characteristics enable the development of this criticism in the game. Therefore, the coach is responsible for adapting the difficulty levels of the games to players' characteristics in U-12 teams, permitting and stimulating the development of different game skills. This assumption highlight the coaches' role as mediator in the sports learning[14].

In addition, based on coaches' speeches we do not recommend the exclusive use of the technique approach in U-12 teams, because of its proposal of exercises that treat the complexity of the game context in a reductionist way. In particular when working to develop critical players who are able to understand and intervene intentionally in the game context. CSD1 indicates the importance of valuing handball teaching in the U-12 level, through games that address aspects like the cooperation and opposition relations, unpredictability and complexity. Another aspect to highlight is that the game-centered approaches may enable learners to find different (and better) tactical solutions[12] when compared to technique approaches.

Considering that TGfU presents the requirements for the development of tactical knowledge, as pointed out in CSD1, other pedagogical approaches could be used with TGfU, for the teaching of handball to U-12 teams. So, we agree with[27:164] that "the crucial point is when to introduce tactical or technical skills", and suggest that different kind of teaching is required to provide multiple experiences to learners. In this way, we believe that, in U-12 teams, a large amount of games and game situations are required, based on the sampling principle of TGfU.

References

1. Fraser-Thomas JL, Côté J, Deakin J. Youth sport programs: an avenue to foster positive youth development. Phys Educ Spo Ped. 2005;10(1):19-40.
2. Burgess DJ, Naughton GA. Talent development in adolescent team sports: a review. Int J Spo Physiol Perf. 2010;5:103-16.
3. Griffin LL, Brooker R, Patton K. Working towards legitimacy: two decades of Teaching Games for Understanding. Phys Educ Spo Ped. 2005;10(3):213-23.
4. Werner P, Thorpe R, Bunker D. Teaching Games for Understanding: evolution of a model. J Phys Educ Recr and Dance. 1996;67(1):28-33.
5. Gréhaigne J-F, Godbout P. Tactical knowledge in team sports from a constructivist and cognitivist perspective. Quest. 1995;47:490-505.
6. Garganta J. Para uma teoria dos jogos desportivos colectivos. In: Graça A, Oliveira J, editors. O ensino dos jogos desportivos. 3 ed. Porto: Universidade do Porto/Centro de Estudos dos Jogos Desportivos; 1998. p. 11-26.
7. Hopper T. Teaching games for understanding: the importance of student emphasis over content emphasis. J Phys Educ Recr and Dance. 2002;73(7):44-8
8. Kirk D, MacPhail A. Teaching games for understanding and situated learning: rethinking the Bunker-Thorpe model. J Teach Phys Ed. 2002;21:177-92.
9. Memmert D, Roth K. The effects of non-specific and specific concepts on tactical creativity in team ball sports. J Spo Sci. 2007;25(12):1423-32.
10. Mesquita IMR, Pereira FRM, Graça ABS. Modelos de ensino dos jogos desportivos: investigação e ilações para a prática. Motriz. 2009;15(4):944-54.
11. Harvey S, Song Y, Baek J-H, van der Mars H. Two sides of the same coin: student physical activity levels during a game-centred soccer unit. Eur Phys Educ Rev. 2016;22(4):411-29.
12. Memmert D, Almond L, Bunker D, Butler J, Fasold F, Griffin L, et al. Top 10 Research Questions Related to Teaching Games for Understanding. Res Quart Ex Spo. 2015;86(4):347-59.
13. Bowes I, Jones RL. Working at the Edge of Chaos: Understanding Coaching as a Complex, Interpersonal System. Spo Psych. 2006;20(2):235-45.
14. Jones RL, Thomas GL. Coaching as 'scaffolded' practice: further insights into sport pedagogy. Spo Coach Rev. 2015;4(2):65-79.
15. Menezes RP, Marques RFR, Nunomura M. Especialização esportiva precoce e o ensino dos jogos coletivos de invasão [Early sport specialization and the teaching of invasion games]. Movimento. 2014;20(1):351-73.
16. Menezes RP, Marques RFR, Nunomura M. O ensino do handebol na categoria infantil a partir dos discursos de treinadores experientes [Handball teaching in under-14 teams according to experienced coaches' discourses]. Movimento. 2015;21(2):463-77.
17. Law 9696. Physical Education Professional regulation, (1998).
18. Milistetd M, Trudel P, Mesquita I, Nascimento JVd. Coaching and coach education in Brazil. Int Spo Coach J. 2014;1:165-72.
19. Law 9615. General provisions of sport., (1998).
20. Marques RFR, Nunomura M, Menezes RP. Sports coaching science in Brazil. Spo Coach Rev. 2016;5(2):1-6.
21. Morales JCP, Greco PJ. A influência de diferentes metodologias de ensino-aprendizagem-treinamento no basquetebol sobre o

nível de conhecimento tático processual. Rev Bras Ed Fís Esp. 2007;21(4):291-9.
22. Silva MV, Greco PJ. A influência dos métodos de ensino-aprendizagem-treinamento no desenvolvimento da inteligência e criatividade tática em atletas de futsal. Rev Bras Ed Fís Esp. 2009;23(3):297-307.
23. Light R, Fawns R. Knowing the game: integrating speech and action in games teaching through TGfU. Quest. 2003;55(2):161-76.
24. Butler JI. Teacher responses to Teaching Games for Understanding. J Phys Educ Recr and Dance. 1996;67(9):17-20.
25. Light R. Coaches' experiences of Game Sense: opportunities and challenges. Physical Education and Sport Pedagogy. 2004;9(2):115-31.
26. Memmert D, Harvey S. Identification of non-specific tactical tasks in invasion games. Phys Educ Spo Ped. 2010;15(3):287-305.
27. Holt N, Strean WB, García Bengoechea E. Expanding the Teaching Games for Understanding model: new avenues for future research and practice. J Teach Phys Ed. 2002;21:162-76.
28. Matias CJAdS, Greco PJ. Cognição e ação nos jogos esportivos coletivos. Ciência & Cognição. 2010;15(1):252-71.
29. Menezes RP. Contribuições da concepção dos fenômenos complexos para o ensino dos esportes coletivos. [Contributions of the complex phenomena conception to the teaching of team sports]. Motriz. 2012;18(1):34-41.
30. French KE, Thomas JR. The relation of knowledge development to children's basketball performance. J Spo Psych. 1987;9:15-32.
31. Holt JE, Ward P, Wallhead TL. The transfer of learning from play practices to game play in young adult soccer players. Phys Educ Spo Ped. 2006;11(2):101-18.
32. Marconi MdA, Lakatos EM. Metodologia científica. 6 ed. São Paulo: Atlas; 2011.
33. Menezes RP, Marques RFR, Morato MP. Percepção de treinadores de andebol sobre as variáveis defensivas e ofensivas do jogo na categoria sub12 [Handball coaches' perception of the offensive and defensive variables of the game in u-12 teams]. Motricidade. 2016;12(3):6-19.
34. Lefèvre F, Lefèvre AMC. Pesquisa de representação social: um enfoque qualiquantitativo. 2 ed. Brasília: Liber Livro Editora; 2012.
35. Lefèvre F, Lefèvre AMC. Discurso do sujeito coletivo: um novo enfoque em pesquisa qualitativa. 1 ed. Caxias do Sul: EDUCS; 2003.
36. Leonardo L, Scaglia AJ, Reverdito RS. O ensino dos esportes coletivos: metodologia pautada na família dos jogos. Motriz. 2009;15(2):236-46.
37. Dyson B, Griffin LL, Hastie P. Sport education, tactical games, and cooperative learning: theoretical and pedagogical considerations. Quest. 2004;56(2):226-40.
38. Launder A, Piltz W. Beyond 'understanding' to skilful playin games, through play practice. New Zeal Phys Ed. 2006;39(1):47-57.
39. Reverdito RS, Scaglia AJ. A gestão do processo organizacional do jogo: uma proposta metodológica para o ensino dos jogos coletivos. Motriz. 2007;13(1):51-63.
40. Garganta J. Trends of tactical performance analysis in team sports: bridging the gap between research, training and competition. Rev Port Ciê Desp. 2009;9(1):81-9.
41. Araújo D. O desenvolvimento da competência táctica no desporto: o papel dos constrangimentos no comportamento decisional. Motriz. 2009;15(3):537-40.
42. Sadi RS, Costa JC, Sacco BT. Ensino de esportes por meio de jogos: desenvolvimento e aplicações. Pensar a Prática. 2008;11(1):17-26.
43. Aquino RLdQTd, Marques RFR, Gonçalves LGC, Vieira LHP, Bedo BLdS, Moraes Cd, et al. Proposta de sistematização de ensino do futebol baseada em jogos: desenvolvimento do conhecimento tático em jogadores com 10 e 11 anos de idade [Proposal of teaching systematization of soccer based on games: development of tactical knowledge in 10 to 11 years old players]. Motricidade. 2015;11(2):115-28.
44. Kröger C, Roth K. Escola da bola: um ABC para iniciantes nos jogos esportivos. 2 ed. São Paulo: Phorte; 2005.
45. Gray S, Sproule J. Developing pupil's performance in team invasion. Phys Educ Spo Ped. 2011;16(1):15-32.
46. Bunker D, Thorpe R. A model for the teaching games in secondary schools. Bull Phys Educ. 1982;18(1):5-8.
47. Turner A, Martinek T. Teaching for understanding - a model for improving decision-making during game play. Quest. 1995;47(1):44-63.
48. Reverdito RS, Scaglia A. Pedagogia do esporte: jogos coletivos de invasão. São Paulo: Phorte; 2009.
49. Greco PJ, Silva SA, Greco FL. O sistema de formação e treinamento esportivo no handebol brasileiro (SFTE-HB). In: Greco PJ, Fernández Romero JJ, editors. Manual de handebol: da iniciação ao alto nível. São Paulo: Phorte; 2012. p. 235-50.
50. Corrêa UC, Silva AS, Paroli R. Efeitos de diferentes métodos de ensino na aprendizagem do futebol de salão. Motriz. 2004;10(2):79-88.
51. López Gutiérrez CJ, Mohamed KM, El Yousfi MME, Zurita Ortega F, Martínez Salinas Á. Elementos comunicativos en entrenadores de baloncesto en diferentes categorías: un estudio de casos. Cult Cie Deporte. 2011;18(6):199-206.
52. Matta GD, Richards KAR, Hemphill MA. Toward an understanding of the democratic reconceptualization of physical education teachereducation in post-military Brazil. Phys Educ Spo Ped. 2015;20(3):329-45.

Acknowledgments

This study was funded by the São Paulo Research Foundation (FAPESP) under Grant No. 2013/05854-8.

Corresponding author

[*]Rafael Pombo Menezes, PhD
[1]University of São Paulo (USP), School of Physical Education and Sport of Ribeirão Preto
Ave Bandeirantes, 3900, Campus USP, Ribeirão Preto-SP, Brazil
Email: rafaelpombo@usp.br

Manuscript received on June 30, 2017

Manuscript accepted on October 1, 2017