RELATING CONTENT AND NATURE OF INFORMATION WHEN TEACHING VOLLEYBALL IN YOUTH VOLLEYBALL TRAINING SETTINGS

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Abstract:
The purpose of the study was to gain a deeper insight into the instructional process in youth volleyball training. A mixed method design, combining systematic observation and interview procedures, was used to examine both the nature and the content of the information provided by coaches during the instructional process. Twenty-eight young volleyball coaches, who coached amateur teams in a club setting, players from 13 to 17 years of age, were interviewed and one of their training sessions was videotaped for systematic observation. Results of interviews showed that coaches have adopted two agendas to teaching volleyball contents: a skills agenda, following a molecular approach, which focuses on the biomechanically efficient component; and a game agenda, using modified games and competition to facilitate the integration of technical skills in game situations. However, coach behaviour profiles showed a predominant technical orientation.
All the volleyball contents were targeted in the coaches' instructions of technique. The same did not occur in the coaches' instructions of individual tactics, and even less in team tactics. The dominance of a technical perspective suggests the need to deepen youth coaching, to help coaches to improve their competence and to change and diversify their instructional approaches.

Key words: *coach, instructional approach, volleyball, youth sports*

Introduction

In the last few years criticism towards the dominant approach to teaching games has extended from physical education to organized sports settings (Wright, McNeill, Fry, & Wang, 2005). Traditionally, teaching games revolves around a prescription of isolated drills which reflects the widespread belief that skill development must be previously addressed aside from its use in the game (Bunker & Thorpe, 1986). Gréhaigne, Godbout and Bouthier (1999) suggest that the most prominent facet of the debate regarding the teaching of team sports and games concerns the relative contribution of the tactical and technical approaches to

teaching games. As these authors indicate, the traditional view of teaching games and sports puts emphasis on the mastery of techniques by means of drill practice, as a fundamental requirement that must precede the progressive introduction to the tactical elements in game context. Conversely, the tactical approach gives the precedence to understanding and learning tactical concepts related to a game or sport, and argues that techniques should only be introduced after learners have perceived they are in need of improving their execution of skills (Gréhaingne, et al., 1999; Griffi n, Mitchell, & Oslin, 1997).

Rovegno (1995) rethought the partial-global controversy that pervades the teaching of skills and games by setting apart two contrasting assumptions: learning is holistic versus learning is molecular. From the molecular perspective, the content is previously divided and sequenced in order to be presented to the learners, so that they may collect, little by little, the discrete parts or pieces of the entire material, i.e. the game contents are performed as isolated skills aside from the actual performance contexts (Rovegno, 1995). Conversely, from the holistic perspective the learner is an active constructor of meaning, organizing and reorganizing the understanding of the content as a whole, a process that in its very essence is different from learning a series of parts or elements (Berlak & Berlak, 1981).

More recently, the either-or dichotomy tends to have faded a bit and become more amenable to several alternative approaches to teaching games that are attracting significant attention from theoreticcians and practitioners, such as *Teaching Games for Understanding* (TGfU) (Bunker & Thorpe, 1982), *Tactical Games Approach* (Mitchell, Oslin, & Griffin, 2006), *Play Practice Model* (Launder, 2001), *Ball School Model* (Kroger & Roth, 1999), and *Step Game Approach* (Mesquita, Graça, Gomes, & Cruz, 2005). All these approaches seek to redefine and deepen the learning process of the technical and tactical aspects of the game into a more intimate relationship, by focusing on the development of game performance through a tactic-to-skill approach (Chow, et al., 2007).

Notwithstanding the relevance of the research in this domain, the fact is that research agendas have been focused on problems concerning the characteristics of practice, giving little attention to the content and nature of information provided by coaches (Gilbert, Trudel, Gaumond, & Larocques, 1999; Seaborn, Trudel, & Gilbert, 1998). Actually, the nature of the information conveyed by coaches reflects the type of approach that frames their instructional process and, consequently, it directs the athletes' attention towards some particular aspects while overlooking others (Mesquita et al., 2008; Pereira, Mesquita, & Graça, 2009).

A critical feature of volleyball is its reliance on skill competency in order to play well enough, or on a virtuosic technique to play at top levels (Griffin, et al., 1997; Maxwell, 2003; Mesquita & Graça, 2002). The logical priority ascribed to technique in volleyball teaching has been supported by the argument for the perpetuation of the traditional approach, even when this approach makes volleyball an unfriendly sport for many children in physical educational programmes (Griffi n, et al., 1997). To what extent the technique absorbs the youth volleyball coaches' concerns and how they deal with these concerns are topics open to coaching research.

To fully capture the complexity of coaching, it is argued that direct observation system techniques should be supplemented along with interviews (Potrac, Brewer, Jones, Armour, & Hoff, 2000; Potrac, Jones, & Armour, 2002; Potrac, Jones, & Cushion, 2007). Nevertheless, even if the triangulation of research methods has been strongly recommended (Denzin, 1989; Patton, 1990), few researchers have used both quantitative and qualitative approaches (Gilbert & Trudel, 2004). According to Potrac and colleagues (2000, 2002, 2007), a mixed-method approach is suited to provide a more holistic understanding of the coaches' conceptions and behaviours. Combining interviews and systematic observations can provide

a more complete description of coaches' pedagogical content interventions (Seaborn, et al., 1998) and, consequently, may generate a valuable knowledge that can be used to improve professional practice (Macdonald & Brooker, 1995).
The present study intends to examine coaches' conceptions about teaching volleyball contents and how those conceptions are reflected in coaches' instructional processes. More specifically, it will be examined to what extent and how the information related to volleyball content provided by coaches reflects either a more technical or a more tactical approach to teaching volleyball in a youth training setting.

Methods

Participants

The participants of this study were twenty-eight young volleyball coaches, eight females (n=8) and twenty males (n=20), certified by the Portuguese Volleyball Federation, and fourteen of the coaches also had a PE degree. The age of the participants and their experience as a volleyball coach was 29.14±8.16 and 7.89±6.28 years, respectively. All of them coached in a club setting with young teams of athletes aged from thirteen to seventeen years. The participation of youth coaches was based on the agreement to take part in the study, and informed consent was obtained from all the participants. From the twenty eight training sessions, one per coach, 4,812 information units were analysed, which means 171.9 units per training session.

Variables and instruments

The systematic observation tools used to describe and categorize the information transmitted by coaches were adapted from multiple sources, as there was no available instrument that entirely satisfied the demands of the study. The categories of the nature of information related to the teaching approach sustained by coaches were adapted from Gilbert et al. (1999) and Hastie (1999), while the categories for the information related to volleyball contents were adapted from Vickers (1990) and Mesquita et al. (2005). Minor adjustments were made in both cases. The assessment of construct and content validity of the observation system was accomplished by three senior researchers in Sport Pedagogy, one of them also having expertise in volleyball coaching and coach education (18 years as a coach of young athletes). Each expert evaluated the list of categories and applied them to classify the information extracted from one volleyball training session. The percentage of agreement between the experts reached the level of 95.3%, meaning a strong consistency. The instrument is presented in Table 1.
The interview protocol was developed to aid in the appreciation of the particularities of coaches' approaches to teaching volleyball to young players, intending more specifically to find out the coaches' orientation to technical and tactical issues. The interview protocol adopted a semi-structured approach with open-ended questions. This format beliefs, perceptions or accounts on a particular topic (Smith, 1995). The semi-structured format permits some adjustment to the interview script in order to facilitate rapport and empathy, and to allow a greater flexibility of coverage and openness to the unpredicted (Smith, 1995). The interview script was also evaluated by the three senior researchers in sport pedagogy, who had substantial experience with interview methods. A pilot study was conducted to appraise the ability, adequacy, and relevance of questions for the target sample. The interview script was built upon the behavioural categories included in the observation system. The questions that compose the script are presented in Table 2.

Table 1. Observation System of Coach Intervention related to instructional approach

1. Information related to teaching approach
Technical (T) - The coach gives information related to biomechanically efficient body position with and without the ball.
Individual tactics (IT) - The coach gives information about decision-making related to the individual performance.
Team tactics (TT) - The coach provides information about team systems, according to principles and rules of playing, and about decision-making related to the collective performance.
2. Information related to volleyball contents
Serve – The coach provides information related to the action of serving.
Reception – The coach provides information related to the action of the first touch after an opponent's serve.
Setting – The coach provides information related to the action of placing the ball in the best place to perform an attack.
Attack – The coach provides information related to the action of throwing the ball to the opponent's court with the objective of making the opponent unable to return the ball.
Block – The coach provides information related to the action of direct opposition to an opponent attack at the space above the net.
Defence and coverage – The coach provides information related to the action of preventing the success of an opponent attack and putting the ball in the best conditions for setting, and also information related to the action of protecting one's own attack from the opponent block.
Basic skills – The coach provides information related to the technique without relation to any particular moment of the game.
Movement patterns without the ball – The coach provides information related to any off-ball movement pattern.

Table 2. Interview script

Q1 – Bearing in mind your perspectives for the introduction to volleyball, what kind of contents should be emphasized in the earlier stages of learning?
Q2 – What kind of priorities do you establish to make the game more approachable to your athletes?
Q3 – What volleyball contents will be included in the training session today?
Q4 – Which of those contents will be addressed for the first time?
Q5 – According to those volleyball contents, what approach to training will you be using?

Data collection

After having explained the aim of the study, clarified the conditions of the participation, and received the free and informed consent, each coach was interviewed in a tranquil place, i.e. as free of interference as possible and appropriate for an open conversation to be conducted. Interviews took place before the training sessions and lasted no less than thirty minutes.

Video recordings of the training sessions took place specifically in the middle of the week in order to assure similar conditions for all the observed sessions and also to decrease the circumstantial influences of particular competitions (Potrac, et al., 2007). All segments were included for observation, except the opening and closing moments of the sessions, and the warm-up segments with no volleyball specific content. The coded time amounted to 2,430 minutes of observation, averaging 87 minutes per session. The sessions were videotaped using a wide angle lens making it possible to include the coach and the ongoing activity in the picture. Coaches had on their lapel an FM wireless microphone that allowed the direct insertion of their verbal interventions into the video stream.

Event recording was the procedure used for data collection. For that reason the frequency of occurrences in each content and type of practice category was computed. Two members of the research team were trained in the allocation of coaching behaviours to correct categories. During the observation training phase the observers discussed and adjusted category

assignment criteria, and controlled the improvement in inter-observer agreement until the threshold of 80%. A test-retest procedure, with a delay of two weeks between the tests, with no feedback being given in the interim, was applied to evaluate inter-observer agreement. No significant differences were found between the first and second tests, indicating that the observers were able to develop a reliable coding protocol.

Data analysis

The recordings of the interviews were transcribed verbatim and subsequently introduced in the qualitative data analysis software QSR Nvivo, version 7.0. Each coach was identified by a numbered code (C1-C28). Data from the interviews were analysed following a grounded theory approach (Côté, Salmela, Trudel, Baria, & Russel, 1995; Strauss & Corbin, 1990). Grounded theory is an inductive methodology for developing theory grounded in data systematically collected and analysed (Saury & Durand, 1998). The analysis began with an open coding phase (i.e. breaking down the data into separate units of meaning) based on constant comparison that proceeded until no more themes emerged from the data. The next phase was focused on grouping units with similar meanings into ever broader and more abstract categories, which enabled the organization and interpretation of the unstructured data from the coaches' interviews.

Descriptive statistics were completed to determine frequencies and percentages. Multiple regression using the *enter method* was applied to examine to what extent the information related to volleyball contents could determine the information related to the instructional approach. Collinearity diagnostics showed the values of *tolerance* between .462 and .971, which is within the reference values mentioned by Pestana and Gageiro (2005) for the use of this statistical tool. The predictive effect of the independent variables on the dependent variable was verified by the values of semi-partial correlations (Pestana & Gageiro, 2005). The level of significance assumed was .05 ($p \leq .05$).

Reliability

The reliability of the observations was assured by assessing the inter-observers and intra-observers' agreement. Reliability tests included three practice sessions, twenty-seven tasks, and 1,280 units of information (39.9% of the total units computed), a value higher than the minimum (10%) recommended in literature (Tabachnick & Fidell, 2000). Cohen's
Kappa was calculated to eliminate any agreement by chance. The values for the agreement of two independent observers ranged from .85 to .90, and intra-observers' consistency ranged from .84 to .89. Since Fleiss (1981) considers an agreement greater than a score of .75 as strong, we therefore considered this data reliable enough to be used.

Results

Coaches' conceptions to teaching volleyball

The coaches from this study seem to stick to a technical orientation when teaching volleyball. Coaches strongly believe that players need to master the *basic skills* before they are able to play volleyball satisfactorily. This argument has been used to begin teaching volleyball by introducing the basic skills through a molecular perspective which is based on the belief that skill development must be previously addressed in an out-of-game context. Some excerpts of the coaches' interviews illustrate that proposition clearly:

> 'I think that the most important aspects in the beginning stages of learning are the basic technical skills, the overhand pass and the forearm pass, and then little by little letting it develop. This is when I put the most emphasis on technique'. (C1, 1st paragraph).
> 'The teaching of volleyball must start with the technical skills, because, unlike other sports, volleyball has a lot of skills, and so it is difficult to learn'. (C10, 1st paragraph).
> 'At first you should emphasize the technique, because if your technique is not working, I think, you can't give any importance to the different team formations or the playing system'. (C23, 1st paragraph).

Moreover, coaches emphasized the training of technical skills in a low variability of practice (i.e. practice of one or more skills outside the game exigencies) putting forward a molecular approach, where components of the biomechanically efficient body position become dominant, and the exigencies of the games to perform the skills are forgotten.

> 'Usually, I run a drill in pairs, face-to-face, in which athletes are in control of the situation'. (C4, paragraph 4).
> '… A kind of analytic work highly divided indeed …' (C6, paragraph 5).
> 'I think that practice must be very analytical, generally with a lot of repetition'. (C8, paragraph 2).
> '… I do a lot of analytical practice, I do a lot of ball contact … half an hour always doing the same, correcting details, refining, doing that in a consistent way in order to get it as perfect as possible'. (C9, paragraph 3).
> 'When I work with the technical aspects, my option is to individualize practice as much as possible, in a very analytical arrangement, each one with a ball…' (C11, paragraph 4).
> 'It must always be a more analytical work, because the technical aspects are the most important ones. If players do not execute the overhand pass or the forearm pass well enough they cannot improve as much'. (C18, paragraph 4).

Another agenda to teaching volleyball emerges clearly among the majority of coaches. The idea of minimal consistency in technique control is reinforced as a turning point from analytical practice (which reflects a molecular approach) to an integrated practice (which reflects a holistic approach). In general, coaches tried to contextualize the technique in situations that progressively include the formal game demands (i.e. 6x6 with the use of the formal rules) mainly through the use of simplified game forms (e.g. 2x2; 3x3, etc.). The contextualization of technical demands in a process of getting closer to the real game situation is the next step. Some extracts of coaches' interviews are illustrative of this trend:

> 'Firstly the preparation in technical terms should be executed, followed by the integration of the tactical aspects'. (C14, 1st paragraph).
> 'Firstly you should begin with the analytical work to simplify the situations, but as they acquire some basis and some consistency in their execution, you move to more integrated work'. (C15, paragraph 3). 'Obviously the approach must always be progressive, even with the game like forms. It's always from the easier to the more difficult, more complex. But in my approach, I always try to keep game-like forms'. (C19, paragraph 3).

The adoption of modified game forms and game-like situations is the instructional strategy coaches used to make the fulfilment and purpose of the game's agenda easier; as evident in the selected extracts:

> 'Whenever possible I take on game-like situations, I think it is the best way to learn'. (C12, paragraph 4).
> 'I teach technique a lot through game-like forms, mainly in groups of 3, so that the ball does not circulate in a single line, but mainly in game forms, 2 on 2, 3 on 3. I think they are great to teach the issues of tactical domain, as also game forms 3 on 3 and 4 on 4'. (C19, paragraph 5).
> 'I always work on technique by simulating the game situation. I don't mean 6 on 6, but just that it is relevant to a game situation. Even when they are working on 3 on 3, when it is give and go, they go, but they have to go to protect. There is always a tactical component, even in the simplest practice forms'. (C28, paragraph 4).
> 'The game should be the most important in the initiation process. It is the game that has to call and pull the players into the sport. It is the game that has the responsibility to keep those players in the sport'. (C20, paragraph 5).

Analysis of training session

Data related to the observed training sessions corroborated the coaches' orientation to a technique approach. The dominance of technical skills among the volleyball contents included in those sessions is clear. The coaches' agenda for the observed session revealed that no skill was introduced for the first time, as coaches reported in the interviews. At that moment, serve and block actions were the primary focus of coaches' efforts, as we can verify in the following extracts.

> 'I'm going to focus on the technical work, specifically in the ready position, feet position and the forward foot placement'. (C11, paragraph 14).
> 'Technically, I think that all basic skills will be included. In the block the point will be stop, jump and land in the same spot, and away from the net, in a way that they were able to put their hands on the other side of the net, to penetrate into the opponents' court'. (C12, paragraph 15).
> 'We're going to start with the technical work on block, almost with no rhythm, only technical work, only correcting the positioning of hands.
> We are going to practice individual block, with a jump from outside-in and inside-out' (C9, paragraph 17).
> 'In the serve our concern will be on the unbent position of the wrist, not allowing the wrist to flex'. (C24, paragraph 18).

Data from the systematic observation on the behaviour profile coaches adopted during the training session confirmed the perspectives portrayed through the interviews. Table 3 shows the relation between the *information related to volleyball contents* and the technical *information related to teaching approach*.

The regression model tested was significant (r2= .852; p= .000), and the variables included in the model explained 85.2% of the total variance of the information related to the technical approach, with a higher contribution of the *basic skills, defence and coverage and block*. All variables were determinants of technical information. Even if not so notorious as technical information, coaches also underscored specific topics of the individual tactics domain. There

was a clear concern from coaches for associating the decisions in block to the opponent's attack, as confirmed in excerpts of C8 and C9:

> 'In terms of attack, we are going to concentrate almost entirely on the players' decision-making. I'm going to set up many situations that require them to see the opponent's block, how they act, in order to take advantage in the attack. So we are going to explore that'. (C8, paragraph 17).
> 'We are going to work on attack with the block marking zone and limiting the attack to one pre-established zone, and, after that we will work on first tempo situations with attack and individual block'. (C9, paragraph 18).

Table 3. Relation between information related to volleyball contents and technical information

	Unstandardized coefficients		Part Correlations	t	Sig.
	B	Std. Error			
(Constant)	.336	.616		.545	.587
Serve	.600	.076	.205	7.894	.000
Reception	.385	.050	.200	7.703	.000
Setting	.288	.081	.092	3.542	.000
Attack	.347	.046	.195	7.492	.000
Block	.458	.035	.343	13.211	.000
Defence and coverage	.366	.028	.345	13.289	.000
Basic skills	.723	.041	.463	17.853	.000
Movement patterns without the ball	.642	.154	.108	4.155	.000

Table 4. Relation between information related to volleyball contents and individual tactics information

	Unstandardized coefficients		Part Correlations	t	Sig.
	B	Std. Error			
(Constant)	.217	.347		.624	.533
Serve	.017	.043	.012	.391	.696
Reception	.132	.028	.140	4.686	.000
Setting	.224	.046	.146	4.884	.000
Attack	.248	.026	.284	9.479	.000
Block	.193	.020	.297	9.898	.000
Defence and coverage	.149	.016	.287	9.583	.000
Basic skills	.099	.023	.129	4.316	.000
Movement patterns without the ball	.008	.087	.003	.097	.922

Table 4 presents all the independent variables included in the regression model, and the one that better explains the *individual tactics information*. The regression model tested was significant (r2= .803; p= .000), and the independent variables included in the model explained 80.3% of the variance of the information related to individual tactics. Regression coefficients conveyed that the *individual tactics information* was higher when the information dealt with *block, attack* and *defence and coverage* (Table 4).

As we can ascertain from Table 4, the information related to volleyball contents about *serve* and *movement patterns without ball* was not a determinant of individual tactical information.
In respect of team tactics, coaches' interviews revealed that coaches also attached importance to the whole-team training on play systems for the different phases of the game, as described in the following excerpts:

> 'I'm going to put emphasis on the playing positions of our defensive system, and they have to comply strictly with those positions'. (C2, paragraph 13).
> 'We are going to work on serve and reception and afterwards the combination of the received work on every position of the setter and try to improve each one' (C18, paragraph 16).
> 'We are going to work on the team tactical aspects, mainly on attack, blocking and protecting their own attack' (C19, paragraph 16).

Table 5 presents the regression model for the information related to team tactics in relation to volleyball content information.
The regression model tested was significant (r2= .625; p= .000), and the independent variables included in the model explained 62.5% of the variance of the information related to team tactics.
Interventions related to *defence and coverage, reception and attack* were predictors of the information related to team tactics. The information related to *serve, setting, block, basic skills and movement patterns* was not a determinant of team tactics information.

Table 5. Relation between information related to volleyball contents and team tactics information

	Unstandardized Coefficients		Part Correlations	t	Sig.
	B	Std. Error			
(Constant)	-.543	.350		-1.552	.122
Serve	-.003	.043	-.002	-.060	.952
Reception	.154	.028	.225	5.443	.000
Setting	.054	.046	.048	1.171	.243
Attack	.112	.026	.176	4.266	.000
Block	.014	.020	.030	.717	.474
Defence and coverage	.172	.016	.455	11.016	.000
Basic skills	-.013	.023	-.023	-.555	.580
Movement patterns without the ball	.033	.088	.016	.377	.706

Discussion and conclusions

The present study attempts to gain a better understanding of youth volleyball coaches' conceptions about teaching volleyball. Results showed that coaches' conceptions presented two agendas to teaching volleyball. The first agenda, which was confirmed in the systematic observation and in the interviews, ascribed a special importance to technique, in which the practice of technical skills apart from the game was viewed as a requisite to play. The second agenda reflected the conception of the gradual integration of the technical skills in the full game, through simplified game forms.
Coach behaviour profile showed predominantly a technique orientation. All specific contents of the volleyball game were addressed in the coaches' technical information. As different

authors argue, the *modus operandi* of traditional approaches to teaching games consists of breaking the game down to its "fundamental skills". Technique always precedes tactics, so skill development away from game situations precedes the use of skills in game play.
The simplifi cation of practice proceeds at odds with the game inherent of situational constraints, since it requires complex mental decisions and physical adjustments under pressure (Blomqvist, Häyrien, Selänne, & Luthanen, 2001; Harrison, et al., 2004; Light, 2008). The technique approach is seen to reflect what Kirk and MacPhail (2002) referred to as the "traditional dualistic divide between cognition and physical performance" (p. 181). Indeed, the practice of skills in closed situations does not merely remove the tactical component (knowing what you have to do in particular situations), but it also removes the crucial components of the technical response (how to perform in those particular conditions). Furthermore, among the motor behaviour research community, ecological and dynamical system scholars also reject the molecular perspective, preferring to emphasize instead non-linear motor control and development processes within a more holistic perspective (Newell, 1986; Prawat, 1992).
Volleyball, as a specific team sport, depends on a repertoire of fundamental skills to be played with success, and a virtuosic technique to play at expert level (Griffi n, et al., 1997; Maxwell, 2003; Mesquita & Graça, 2002). French, Werner, Rink, Taylor and Hussel (1986) and Rink, French and Tjeedsma (1996) claim that students' abilities to execute skills can influence the tactical options that are available to them, which means that minimum requirements of skill execution are necessary in order to integrate the teaching of technique and tactics in combination. Indeed, this kind of argument for ascribing logical priority to technique in volleyball teaching is the key assumption of traditional approaches and it seems to be shared by the coaches of this study, in view of the higher value given to technique. However, different authors (Maxwell, 2003; Mesquita, et al., 2005; Rovegno, 1995) point out the intimate relationship between cognitive function and physical action, or in other words, the inseparability of technique and tactics. The complex and changeable context of the game requires, not only the mental solution of the tactical problem (i.e. decision-making), but also the adaptation of a fi ne-tuned motor response to the mutable conditions of the situations. Even so, as remarked by Rovegno (1995), rather than trying to control the complexity of performing in a motor activity by controlling the complexity of the coordination and control demands of efficiency, coaches should control complexity by controlling the environmental demands.
Coaches' concentration on technique was remarkably notorious concerning the serve, as no information related to individual tactics or team tactics was convoyed by the coaches. The serve being one of the earliest skills to be taught, and a support for posterior learning may be the main reason for such a technique to be overemphasized. Though, it may have detrimental effects on the strategic use of the serve. When technique is developed without connection to tactics the transfer effect of learning to game situations is not encouraged, which may restrain to a significant degree the potential of players in matters of initiative-taking, decision-making, and knowledge of the game (Bunker & Thorpe, 1982). Maxwell (2003) suggested that asking players to identify and discuss serve options is an effective strategy in developing their knowledge structures. As a consequence the focus of coaches' intervention should be on the tactics or strategies students use, and the necessary interventions on technical aspects should make it clear how they will affect the athletes' tactical decisions. Rovegno (1995) rebuts the traditional ideas about teaching volleyball and sequencing content, such as the notion that players must be taught the correct technique or they will develop bad habits, and

the notion that players should develop the mature pattern of fundamental skills before using those skills in game situations.

Information on *attack, blocking*, and *defence and coverage* had the largest contribution to the amount of information on individual tactics delivered by the coaches. This makes sense as far as involving larger opponents' interference, these game actions demand a higher decision-making capability. Acknowledging that these three contents correspond to three enchained moments of the game, it is feasible to infer that the coaches' intervention on tactics adhere to the event-based logic of the game.

Somewhat surprisingly, the information related to team tactics only presented an association with the information related to the first touch actions (*reception* and *defence and coverage*) and to attack. And so, even if critically dependent on the coordination of all members of a team (Mesquita & Graça, 2002), setting and blocking was not mentioned in the coaches' team tactic information.

Considering the tactical complexity of setting and blocking, it is diffi cult to understand the reasons for the absence of this information. Based on empirical research, Abernethy, Wann and Parks (1998) highlight that even when coaches agree that tactical decision-making is the most important to game success, they are not prone to spend more time with tactical decision-making practice than technical skills.

A number of studies have compared learning outcomes between technical and tactical approaches, and have come up with inconsistent findings (Barrett & Turner, 2000; French, et al., 1996). The assumption that skill teaching would lead to greater skill development and that tactical instruction would lead to a greater understanding of the game strategies and better game play has not been definitively established. Studies have revealed no differences between tactical and technical groups for skill execution under game conditions (Griffin, Oslin & Mitchell, 1995; Mitchell, Griffi n & Oslin, 1995; Turner & Martinek, 1992). Turner and Martinek (1992), who found that tactical participants executed skills within the game better than technical counterparts, suggest that inconsistency across studies could be due to the variation in the duration of the intervention, notwithstanding the inconclusive outcomes there may be a solid reason for giving preference to the holistic approach based on tactical demands – motivation. Several studies support that players would be more interested in this alternative to the molecular approach when teaching games (Griffin, et al., 1995; Lawton, 1989; Rovegno, 1995; Turner, 1996; Wright, et al., 2005).

The coaches in this study view the game play situations as the most important factor in fostering a lifetime commitment to volleyball in the earlier stages of sport involvement, they also showed a predominant technical orientation. Furthermore, the wide range of coaching experience present in this study allowed the confirmation of the prevalence of molecular approach as a common profile throughout instructional behaviours.

The dominance of a technical perspective suggests the need to deepen youth coaching, to help coaches to improve their competence and to change and diversify their instructional approaches. However, for a better understanding, further research should consider how different variables, i.e. coaches and players' characteristics, motor task complexity, etc., influence the instructional approaches adopted by coaches, namely by referring to in-depth qualitative analysis.

The coaches of this study espoused two agendas to teaching volleyball contents: firstly, a skill agenda following a molecular perspective that rewarded biomechanical efficiency and deferred skills contextualization; and secondly, a game agenda, favouring a more holistic approach based on modified game forms and play context to facilitate the integration of technical and tactical components in the actual game.

However, coach behaviour profiles showed a predominant technical orientation. All the volleyball contents were targeted in the coaches' instruction of technique. The same did not occur in coaches' instruction of individual tactics, and even less in team tactics. Information about the serve was devoid of any tactical clue, and information related to team tactics was restrained to *defence and coverage, reception* and *attack*.

There is a striking gap between the instructional profile observed in this study and the recommendations extracted from recent sport pedagogy and coaching for changing the practice and instruction. Indeed, the dominance of a technical perspective suggests the need to give prospective coaches ample opportunities to acquire knowledge and practice various approaches to coaching. Instead of trying to determine which is best, efforts should be made to determine the strengths of each approach and examine how coaches may use instructional models according to particular and ecological training settings.

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