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A CONSTRAINTS-LED APPROACH IN VOLLEYBALL

UN APPROCCIO GUIDATO DAI VINCOLI NELLA PALLAVOLO

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Abstract

This article gives an overview of how a coach-centric training approach has several limitations. In contrast to this, the "Constraints-led Approach" (CLA) is presented, in which the environment, the organism and the task are at the center of the creation of training sessions aimed at improving the execution of the technical gesture. A practical example of a specific CLA-based training session for volleyball is proposed, with the aim of demonstrating how this approach can be implemented and how it differs from a traditional training methodology.

In questo articolo viene data una panoramica di come un approccio di allenamento incentrato sull'allenatore presenti diversi limiti. In contrapposizione a questo viene presentato l'approccio guidato dai vincoli "Constraints-led Approach" (CLA) dove ambiente, organismo e compito sono al centro della creazione di sedute di allenamento volte al miglioramento dell'esecuzione del gesto tecnico. Viene proposto un esempio pratico di una seduta di allenamento basata sul CLA specifica per la pallavolo, con l'obiettivo di dimostrare come tale approccio possa essere attuato e in che modo si differenzia da una metodologia di allenamento tradizionale.

Keywords

Constraints-led approach, affordances, constraints, volleyball.
Constraints-led approach, affordances, vincoli, pallavolo.

Introduction

Coaches strive to facilitate change in athletes' movement to both improve sports performance and prevent injuries. Athletes, for their part, should also be able to completely master the technique of the gesture they are going to perform (Favre, 2017).

Being technically aware and able to vary the movement is essential, as exercises performed incorrectly can cause unnecessary stress on the body causing injuries (Hall, 2012; Bahr & Maehlum, 2004) which can limit the time to devote to training and the quality of this.

A common method for teaching or modifying a sporting gesture involves explicit instructions provided by the coach. This approach consists of giving verbal instructions and feedback to athletes on the performance of a given skill (Rucci & Tomporowski, 2010). Usually, the coaches create a series of instructions for a given movement, based on an ideal technique model and on the sensations deriving from their own experience. This way of proceeding has several limitations, as it is unlikely that athletes will share experiences and physical characteristics identical to those of the coach. The use of this approach is also based on the assumption that explicit instruction is optimally effective for modifying motor behaviour. Contemporary literature has questioned the role of explicit education as the best method for developing complex movements. In particular, the explicit approach can be problematic when considering complex performance requests (Masters, 2012).

An explicit approach has several negative effects on performance including:

- Deterioration of skills under pressure (Lew et al., 1996; Masters, 1992).
- Greater dependence on the coach (Patterson & Lee, 2013; Young, 2006).
- Poor decision-making skills (Masters et al., 2008).
- Greater deterioration of skills under physiological stress (Poolton et al., 2007).

Therefore, it is clear that a coach-centred approach, in which the latter makes all decisions and training is primarily directive rather than collaborative, is not very effective.

According to Davids (Davids et al., 2003), it is possible to identify constraints relating to the execution methods of the gesture that can create sense-motor interactions, called sets, which lead to movement control. This idea is the basis of the Constraints-led Approach, and involves three factors that influence the execution of a movement:

- The environment in which the movement is carried out.
- The movement being trained.
- The body that performs the movement.

Each of these factors is able to constrain, or rather, direct the way a movement is performed in a particular direction. The environment makes some ways to perform the movement more effective than others and excludes some, in the same way the demands placed on the task and the properties of the organism behave. This interaction between environment, task and organism places constraints on the ways in which movement can be performed. The movement, therefore, will be determined by the interaction of the three constraints mentioned above, the training can consequently be varied by modifying each of the three constraints. The changes will affect how movement is controlled and consequently the sensorimotor sets that are produced.

CLA is based on the ecological dynamics theory (Araujo et al., 2006), which considers athletes and sports teams as complex adaptive systems in which coordinated patterns are continuously formed, modelled by the interaction of constraints. The role of professionals, such as coaches for example, is to design learning and development experiences for athletes in the best possible way. Constraints shape the behaviour of athletes and sports teams during training and competition. The relationship between athlete and environment forms the basis for understanding performance and development, rather than focusing only on individual, mostly physical qualities. With practice and experience, information in an educational context (affordances) can be coupled with movements to modulate, refine and adapt patterns of action as they emerge (Farrow & Abernethy, 2003). The contexts of practice (training environments) must therefore be structured in such a way as to replicate those that are the key elements of the performance context (competition environment), considering the fact that reproducing a performance envi-

ronment in detail is almost impossible given its unpredictability.

This approach is described in detail in the text *"The constraints-led approach: Principles for sports coaching and practice design"* (Renshaw et al., 2019), in which the authors state that although the theoretical-practical principles for the implementation of this method, there is a lack of application proposals in the various sports disciplines, therefore the purpose of this article is to try to provide a contribution in this sense, proposing an example of exercise in the field of volleyball.

Methods

The proposed practical activity aims to improve defensive performance, to improve the response of the block on the attacks of the opponents.

This training session can have variable duration and can be used both to allow players to learn to respond to a series of standard types of attacks, and to respond to a typical game system of a team that will have to be faced in the immediate future.

To be able to concentrate exclusively on the defensive phase of the block, during the training sessions the usable field is only the one inside the three-meter line. Furthermore, the training session is structured in such a way as to be as close to a real game situation as possible. The athletes are divided into two groups, so that three focus on the defence phase, with the task of making a block, while the others attack and then break through the defence. The attackers have a setter at their disposal which makes the game situation very unpredictable, and the defenders will have to read the play of their teammates in the best way in order to make a good block. The practice environment is also equipped with video cameras, which can provide the coach and players with feedback on the movements and game actions performed.

The first step in the design of an intervention based on the CLA is the identification of the constraints relating to a given sport. With the collaboration of a volleyball trainer, an analysis of the discipline was carried out based on the theoretical framework underlying the CLA (Table 1).

Table 1 The constraints identified in volleyball

Organism Power Speed Endurance Intention Motivation Confidence	**Environment** Spectators Temperature Light Material of the ground	**Task** Scoring system Number of opponents Position of the opponents Position of the teammates Time boundaries Spatial boundaries Additional rules

Subsequently, based on the identified constraints, exercises can be devised, providing different environments, more or less representative of the real competition context (Table 2).

Table 2 Exercises sorted by degree of difficulty and representativeness

Block without opponents Block 1 vs 1 Block 1 vs 2	Small sided games 3 vs 4 Game simulation
Less representative	More representative

Finally, as a guide for planning the activity and applying it, the G.R.O.W (goal-reality-option-will) model (Whitmore et al., 2013) is used, specifying the various points it contains.

The goal of this training session is to improve the team's defensive performance. A medium-high level of athletes has been hypothesized, who therefore have an already consolidated

technical execution and therefore it is possible to work on the adaptability of the same. The proposal has been structured in such a way as to be as close to a real game situation as possible. The equipment used is the traditional one for training, such as balls, the net and the side bands. It is also important to prepare your collaborators for the training session, assigning each one a task to respect so as not to cause confusion during the session.

The initial phase involves carrying out an adequate warm-up and a short session aimed at informing the athletes about the purpose of the intervention. The awareness on the part of the athletes will make it easier to understand and contextualize the exercise. Subsequently the athletes arrange themselves on the field so that three will be in defence, to make a block, while the others in attack, trying to score. The attackers have a setter at their disposal who will make the game situation very unpredictable, while the defenders will have to read the play of their teammates in the best possible way in order to make a good block.

The practice environment used is the regular volleyball field.

The constraints on which act are related to the task, in this specific case the first element on which act is the reduction of the field which must be limited to the three-meter line. Subsequently, it is possible to modify the scoring system, creating a sort of mini set of 10 points that will be considered successful for the defence if the latter scores at least 7 points.

The opponents (attackers) may be forced to initially perform a certain type of attack, up to a series of attacks of different types and randomly.

Performance can be evaluated simply by looking at the score achieved.

The success of the training and therefore of the intervention can be evaluated in the first place with the direct observation of the coach who evaluates the improvement in the performance considered.

The score achieved by the defending team can provide further, more objective feedback.

The use of video analysis can provide an objective point of view on technical performance.

Discussions

The activity described is an activity to be proposed to a category of athletes with a medium-high skill level. This is one of the activities that comes closest to a real game situation, thanks to the great unpredictability that it possesses given to it by the presence of a setter who can choose to lift the ball in three different positions and to the attackers who in turn can choose to perform. different types of attacks. In addition, the pressure that athletes suffer during the game is also simulated and then they train to face it and make complex decisions under stress, simultaneously observing how opponents move.

The goal of improving the response of the block on the opponent's attacks allows the athletes to be precise and punctual in the execution of this in a match against opponents other than the teammates or the coach, thus guaranteeing the team a first line of defence against the attempt. opponent to score. The focus of learning is that the athlete can have a defensive reorganization that guarantees solidity both when talking about a single block and when he has to join the side for a double block, creating together a solid line of defence. The purpose of the training session is to provide athletes with game situations that require, recall and offer opportunities for blocking against opponents. In this session it was decided to recreate a mini set of 10 points, which simulated a normal set, in which both teams (defenders and attackers) started from 0 points to try to win the set. However, one can change the scoring mode by creating greater pressure on one side or the other. For example, one could choose to start the set on a score of 4-2 for the attackers, in order to simulate a critical game situation in which the opposing team is in the lead. Although the activity has been designed for athletes of a certain level, this does not mean that it cannot be proposed to athletes with a lower skill level, since by applying some changes, for example, removing the setter and inserting an auto-lift it makes the execution much easier for the attackers and consequently more suitable for those who are still inexperienced.

Conclusions

From the use of the CLA emerges the need to consider a series of aspects related to the environment, the subject (organism) and the task to be performed, in order to design training sessions based on the constraints, of which the individual, in this case the athlete needs to correctly learn the basics of a movement and improve its interaction with the different game situations. The most interesting aspect of the CLA is not the innovation that is given to the proposed exercises, but the new interpretation assumed by the figure of the coach. The coach, in fact, becomes the one who is committed to creating a suitable environment for athletes, in order to stimulate them in learning movement according to what they perceive from the environment itself and from everything around them. The role of the coach, therefore, is always of fundamental importance, as he must have good technical skills, moreover in this context, he must be able to help the athlete to grasp and perceive the affordances present in the environment with which one interacts. On the other hand, CLA-based training favours adaptive learning by athletes, aided not only by the affordances and constraints imposed, but also by the various feedbacks they receive during the training session, both from the coach and from multimedia information sources, such as video footage. The more the athlete will be able to perceive many salient information, the more effective the learning will be. Therefore, the constraint-based approach seems to be quite promising to allow athletes to improve not only in the execution of the movement, but also to understand how to perform it efficiently based on the affordances they perceive. This attempt, albeit substantially theoretical, to decline volleyball training from a CLA perspective, represents a first step for a subsequent application on the field. The next step will be to apply this proposal, evaluating the learning results, comparing this approach with the most used ones, in order to possibly affirm its greater effectiveness.

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