# GAME SITUATIONS IN YOUTH BASKETBALL PRACTICES

# LAS SITUACIONES DE JUEGO EN EL ENTRENAMIENTO DE BALONCESTO EN CATEGORÍAS BASE

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**ABSTRACT**

The aim of this study was to analyse the type of training situations used in youth basketball practices. The sample includes 394 training tasks from an U12 team and 389 tasks from an U14 team. The variable *game situation* was analysed. A descriptive analysis of data from each of the teams and an inferential analysis utilising the Mann Whitney U and Kolmogorov-Smirnov tests were done. There was a predominance of 1-on-1, 2-on-2, and 3-on-3 situations in the U12 team´s training and 1-on-1 and 5-on-5 situations in the U14 team´s training. For U12, an evolution of situations ranging from simple to complex was seen. The results suggest that the U12 team's tasks are typical of a comprehensive model based on a constructivist approach while the U14 team's tasks come from a technical model.

**KEY WORDS** Game situations, Sport initiation, Coaching, Coach, Basketball.

**RESUMEN**

El objeto de este estudio fue analizar el tipo de situaciones de entrenamiento utilizadas para el entrenamiento del baloncesto en categorías de iniciación. La muestra la constituyen 394 tareas de un equipo de minibasket y 389 de un equipo infantil. La variable de estudio son *situaciones de juego*. Se realizó un análisis descriptivo y un análisis inferencial mediante las pruebas de *U de Mann Whitney* y de *Kolmogorov-Smirnov*. Existe un predominio de las situaciones de 1vs1, 2vs2 y 3vs3 en los entrenamientos del equipo minibasket y de situaciones de 1vs1 y 5vs5 en el infantil. Se aprecia una evolución en la temporada del equipo minibasket de situaciones más simples a más complejas. Los resultados sugieren que las tareas del equipo minibasket son propias de un modelo comprensivo basado en una metodología constructivista mientras que las del infantil de un modelo técnico.

**PALABRAS CLAVE** Situaciones de juego, Iniciación deportiva, Entrenamiento Deportivo, Entrenador, Baloncesto

## INTRODUCTION

Sports training allows for the acquisition and development of abilities that determine an athlete´s skill (Baker, Horton, Robertson-Wilson, & Wall, 2003). It is considered one of the ways that determine the development of the player´s expertise (Baker et al., 2003; Williams & Reilly, 2000). Sáenz-López, Ibáñez, Giménez, Sierra and Sánchez (2005) state the importance of sport training and the suitability of the formative process for an adequate development and skill improvement of basketball players. Analysis of the sport training process is necessary for its optimisation (Ibáñez, 2008). The analysis of the initial formative stage is especially important since it is the foundation for the subsequent stages and can determine future results (Giménez, 2009).

Regarding the training of young athletes and the formative process in the initial stages, Cárdenas and Conde (2007) state the need to differentiate between the terms *sport initiation* and *sport formation*. These authors identify initiation as a period in which the player becomes familiar with the sport, and they define formation as a continuous process that includes each one of the experiences that the player has throughout his or her sport career and that includes the period of initiation. Within the area of sports initiation, there are different perspectives from which to understand initiation; González, García, Contreras and Sánchez-Mora (2009) published a review on this subject. In a player´s sports career, there can be various steps or levels that mark the formative process of the player.

Within a specific sport modality, there are age groups that constitute a division. There are relationships between the divisions and the formative stages of the basketball player, which determine, for example, the way in which training in this sport should be carried out (Cárdenas, 2006; Ibáñez, 2002). This study is focused on the U12 (mini-basketball) and U14 divisions, which, according to Ibáñez, are identified as the stages of *sports initiation* and *sports learning or mechanization*, respectively.

Between the various aspects related to a suitable process of learning and teaching, Giménez (2009) highlights the relevance of a coach being able to create and design adequate exercises. Given the importance of becoming familiar with the proposed training situations for teaching a sport in youth or initiation divisions, studies have been carried out about the type of training tasks that are utilised for team sport training (Cañadas & García, 2005; Cañadas & Ibáñez, 2010; Cañadas, Parejo, Ibáñez, García, & Feu, 2009; Moreira, Pinto, & Graça, 2007; Saad & Nascimento, 2007).

Although the analysis of the learning/training situations is an area of study that is currently on the rise, the majority of the studies that have been carried out are based on the analysis of weeks of training (table 1). A few training tasks cannot properly reflect a model or style of training, because this way of training may be influenced by factors such as the point in the season from which they are taken,

player attendance, social desirability, etc. The analysis of an entire season of training tasks is a true reflection of the way that training is carried out during a year. Examples of this type of method are the following studies: Cañadas and García (2005), Moreira et al. (2007), Cañadas, Ibáñez, García and Sáez (2009), Cañadas, Parejo et al. (2009), Cañadas and Ibáñez (2010) and the present study. These studies, though time consuming, demonstrate a true reflection of the sports training that is carried out in initiation divisions.

**Table 1.** Data about studies that analyse teaching/learning tasks in area of sports training.

| Author(s) | Teams | Division (age of players) | # of practice sessions analysed per team |
|---|---|---|---|
| Saad & Nascimento (2007) | 6 | Pre-mini-bb (10-11) Mini-basketball (12-13) | 10 |
| Ramos (2008) (study in chapter 5) | 1 | Mini-basketball (10-13) | 4 |
| Lemos (2005) | 5 teams (5 coaches) | 3 sport initiation & 2 U16 | 4-6 |

Another type of study, which analyses the type of training tasks, relates it to the coach´s degree of expertness or experience and looks closely at the figure of the coach (Lemos, 2005; Ramos, 2008).

The functions that the coach carries out are quite varied (Ibáñez, 2009; Meinberg, 2002). Among these functions are designing training tasks. As demonstrated in studies such as those by Ibáñez (1997), the coach is influenced by multiple variables that affect his or her coaching model. These variables, therefore, also shape the type of training tasks that the coach designs. The aim of this study was to analyse the training tasks (not the figure of the coach), though we are aware that certain variables associated with the coach may influence the type of tasks.

To plan and monitor training, Ibáñez (2008) proposes a series of elements that define tasks, denominating them *pedagogical variables of training*. As demonstrated in studies by Cañadas, Ibáñez, et al. (2009), Cañadas, Parejo, et al. (2009) and Cañadas and Ibáñez (2010), the analysis of these variables allows us to describe how sports training is being carried out, in this case, in initiation divisions.

One of these pedagogical variables is *game situations*. Basketball is a team sport that is carried out in a game situation of 5-on-5, in which five players on offense compete against five players on defense. Oliveira and Graça (1997) highlight the advantages of teaching basketball in early stages, by simplifying the situation through decreasing the number of players in both stages. The design of teaching/training tasks is determined by the complexity of the tasks with regard to perception and decisions (Ruiz & Sánchez, 1997). Thus, the design of training situations is related to the processes of perception, decision-

making, and movement execution that come with the skills that this sport demands (Ruiz & Sánchez, 1997).

As demonstrated in a study by Herbert, Landin, and Solmon (2000), task organisation based on the progression from simple to complex tasks favours the learning process. Based on the comprehensive model for teaching sport, and employing a constructivist methodology, the use of several game situations and their organisation throughout the season was carried out, with the goal of favouring the players´ learning (Cárdenas, 2006; Ibáñez, 2008; Oliveira & Graça, 1997).

In studies such as those by Cañadas and García (2005), Lemos (2005), Saad and Nascimento (2007), Ramos (2008), and Ortega, Palao and Puigcerver (2009), game situations were studied by analysing training sessions.

The aim of this study was to analyse the type of game situations that are carried out throughout a basketball season on the training sessions of two teams, one from an U12 mini-basketball division and the other from an U14 division.

## METHOD

**Design**. This was an empirical, qualitative study. Specifically, it was a multiple-case study (Montero & León, 2007).

**Sample.** The study´s sample was composed of 394 training tasks from an U12 mini-basketball team (10-11 year-old players) and 389 tasks from an U14 basketball team (12-13 year-old players) from the same season. This involved the analysis of 74 practice sessions from the mini-basketball team and 70 sessions from the U14 team. In both cases, it included every practice session for the season.

These teams belonged to two different sport clubs that carried out sport initiation from a vertical teaching-learning process (training in a specific sport modality, in this case, basketball) and were federated. These identifications are based on the criteria proposed by Gonzalez et al. (2009).

The tasks were designed by two basketball coaches with differing education and experience in this area. Coach "A", who led the mini-basketball team, had three years of experience as a youth basketball coach, in addition to having held other positions within this sport. He also had seven years of playing experience. This coach was part of an educational program that teaches basketball from a comprehensive methodology. This educational program is characterised by the use of mentoring and reflecting on one´s actions as its primary means of education. Regarding Coach "B", the U14 coach, this was the coach´s first year of coaching. The coach had 10 years of experience as a player. Both coaches had their licensure in physical activity and sport sciences as well as their first level basketball coaching certificates.

**Variables**. The study´s variable is the *game situation*. This is one of the *pedagogical variables of training* (Cañadas, Parejo, et al., 2009; Ibáñez, 2008) and it represents the number of players and the role that they have in a specific task. The categories of this variable are: 1-on-0, 1-on-1, 1-on-2, 2-on-0, 2-on-1, 2-on-2, 2-on-3, 3-on-0, 3-on-1, 3-on-2, 3-on-3, 3-on-4, 4-on-0, 4-on-1, 4-on-2, 4-on-3, 4-on-4, 4-on-5, 5-on-0, 5-on-1, 5-on-2, 5-on-3, 5-on-4, 5-on-5, 5-on-6, others.

**Instrument**. The *PyC Basket 2.0* computer program was utilised for registering the training sessions. This computer program allows for registering the planned training (theoretical training) as well as the training that is carried out (real training) through its website. This informatics tool was created by and for the planning and monitoring of sports training (Ibáñez, Macías, Pérez, & Feu, 2001). *PyC Basket* was created based on the structures that define sports training, in general, and specifically in regard to the elements of basketball training defined by experts in the area.

**Procedure**. Both of the coaches were in charge of registering each of the sessions that they designed, and the sessions were later reviewed by an external evaluator.

Before recording the data, training of the coaches and the external evaluator was carried out to educate them on the instrument and the way in which they should register the practice sessions. There was also a data registry trial to analyse the *quality of the data*.

The registry trial consisted of classifying 37 training tasks. After this trial, the intra-rater reliability (two registers taken by the same coach at two different moments) and inter-rater reliability (the registers taken at the same time) based on the procedure established by Castellano, Hernández Mendo, Gómez de Segura, Fontetxa and Bueno (2000) were analysed.

To determine the *quality of the data*, the agreement rate and the Pearson correlation coefficient were utilised, through a frequency distribution (Pardo & Ruiz, 2002). To calculate the degree of agreement, keeping in mind the order that the coach and external evaluator registered each of the categories, Cohen´s kappa was utilised (Cubo, Martín, & Ramos, 2011). The Pearson´s correlation coefficients had values of 0.99 for Coach A and 0.96 for Coach B (intra-rater agreement) and of 0.99 for Coach A and the evaluator and 0.98 for Coach B and the evaluator (inter-rater agreement) ($p < .01$).

Regarding the values of Cohen´s kappa, for Coach A, they were 0.94 (intra-rater agreement) and 0.98 (inter-rater agreement). For Coach B, they were 0.96 (intra-rater agreement) and 0.97 (inter-rater agreement).

After the reports that were generated by the informatics program, the data analysis was carried out.

**Statistical analysis**. The data registered by *PyC Basket* were incorporated into the SPSS 15.0 computer program. Descriptive and inferential analyses were carried out. For the inferential analysis, due to the nominal character of the data, the non-parametric tests of *Mann-Whitney U* and *Kolmogorov-Smirnov* for two independent samples were utilised. The reason for using both of these tests was to further the study of the differences that exist between the training tasks of the two teams. The *Mann-Whitney U* calculates whether there are differences between the averages of each of the samples. This type of test calculates whether there are large differences between the samples. It was through the *Kolmogorov-Smirnov* test that we were able to discern whether there were differences in the distribution of the data of each of the samples (Pardo & Ruiz, 2002).

**RESULTS**

### Descriptive analysis by season

The most utilised game situations for the mini-basketball team´s training tasks were 1-on-1 (39.85%), 2-on-2 (16.24%), and 3-on-3 (10.41%). For the U14 team, in almost half of the tasks, 1-on-1 tasks were proposed (42.53%), and the second most utilised game situation was 5-on-5 (14.94%). However, for the mini-basketball team, 5-on-5 represented just 1% of the tasks (figure 1).
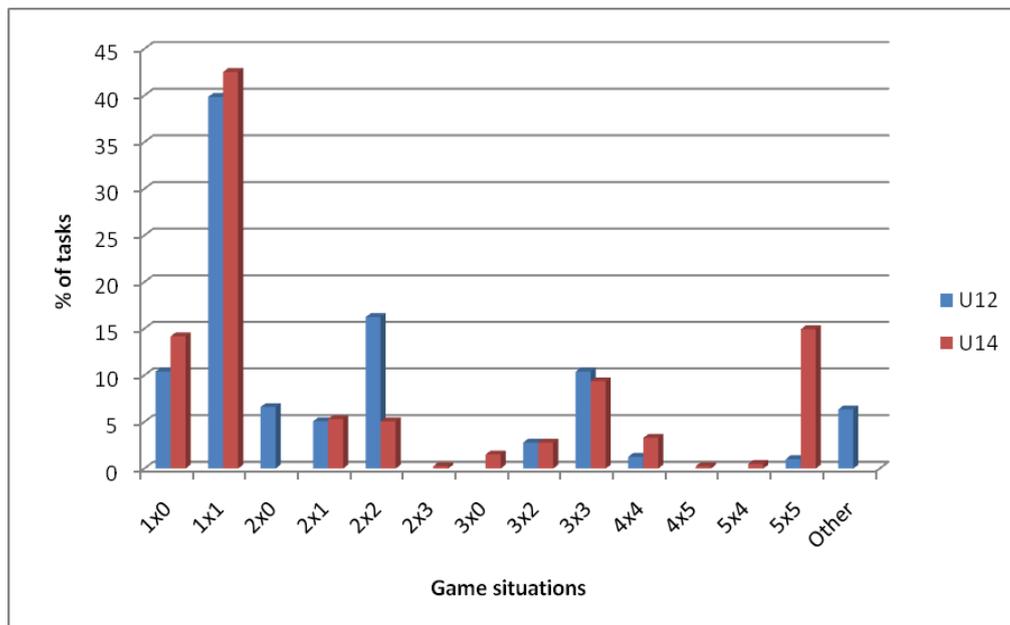


**Figure 1**. Percentage of game situations utilised for mini-basketball and U14 teams during the season.

### Evolution throughout the season

The data that correspond to the mini-basketball team´s training tasks (Figure 2) demonstrate that an evolution throughout the season takes place in 1-on-1, 2-on-2, and 3-on-3 game situations. The 1-on-1 situations decline throughout the season, while the use of group game situations, such as 2-on-2 and 3-on-3, increases.
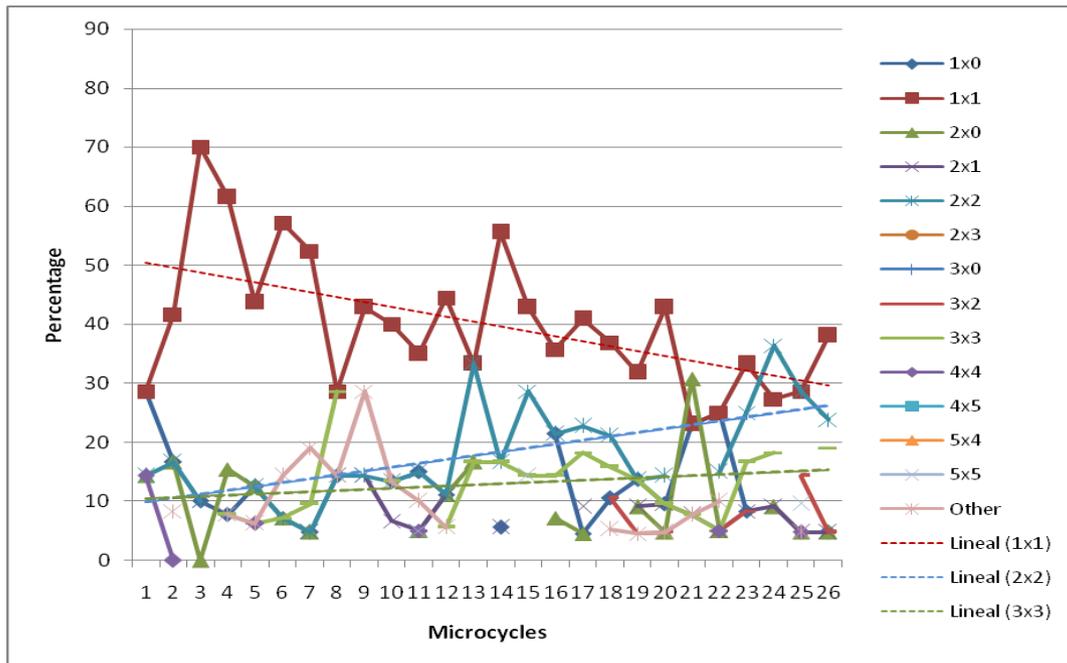


**Figure 2**. Percentage of game situations utilised in each of the season´s microcycles for the mini-basketball team.

For the U14 team´s tasks (Figure 3), a decrease in the 1-on-1 and 1-on-0 situations was found throughout the season. Thus, it was noticed that many of the game situations were planned at specific moments and were not used the rest of the time. For the 5-on-5 situations, which were one of the most common for the U14 team, their presence was concentrated into 6-7 weeks of the season, where 5-on-5 situations were worked on to a greater extent. However, during other weeks, no 5-on-5 situations were recorded.
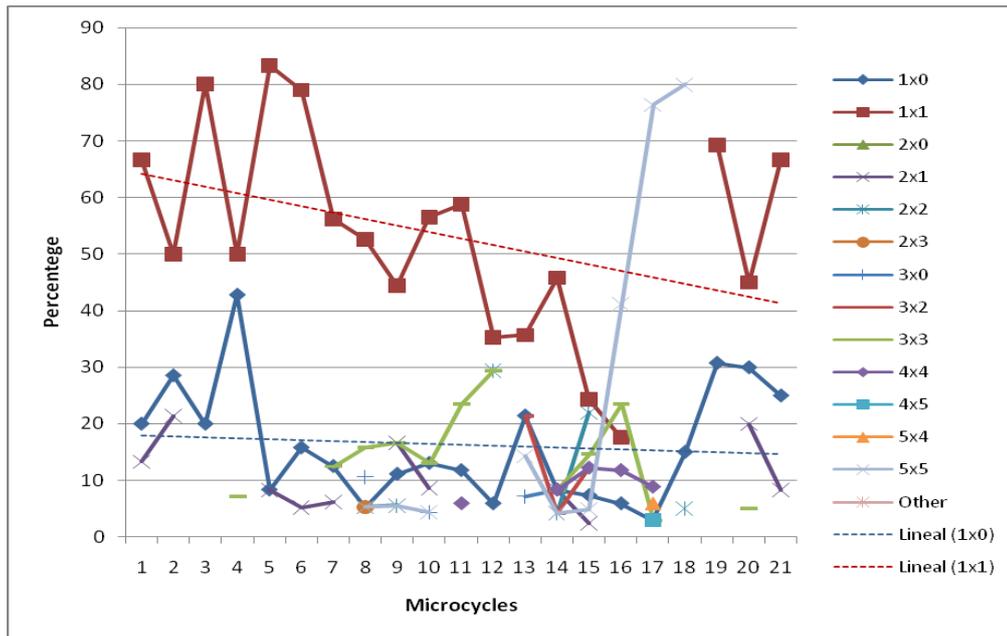
**Figure 3**. Percentage of game situations in each of the season´s microcycles for the U14 team.

*Inferential analysis.* The *Mann-Whitney U* demonstrated that there were no statistically significant differences between the samples´ means ($U$= 75319.5, $p$ >.05). However (and with the aim of further studying the differences that may exist between the two samples), it was analysed based on the distribution that was registered in each of the *game situation* categories. Therefore, the *Kolmogorov-Smirnov* test was utilised. The result demonstrated that there were statistically significant differences between the type of game situations utilised by the mini-basketball and U14 teams ($Z$= 1.478.5, $p$ <.05).

## DISCUSSION

Cárdenas (2006) established five formative stages for the basketball player, characterising how his or her training should be at each stage. The training tasks of the mini-basketball team are in line with what that author recommends for the first stage: predominance of 1-on-1 situations. In the study by Cañadas and García (2005), 1-on-1 was also the most utilised situation during the season in a team from the same division.

In one study, for the practice sessions of two football teams from the U10 and U12 divisions, the 2-on-2 and 3-on-3 situations predominate (Saad & Nascimento, 2007). In the mini-basketball tasks from the present study, these types of situations were also present in high percentages. Authors such as Oliveira and Graça (1997), Cárdenas (2006), and expert coaches that were interviewed in a study by Ramos (2008) state their preference for the 3-on-3 situation, indicating that it is a more appropriate game situation than 5-on-5 for youth teams.

Cárdenas (2006) recognises the importance of the 5-on-5 game situation starting at the U16 level as well as the need to strengthen team play through 3-on-3 situations for the U14 division. The 3-on-3 situation is the fourth most utilised game situation for the U14 division in the present study. The importance of 5-on-5 situations has also been stated by "inexpert" coaches of initiation sport in studies such as those by Lemos (2005) and Ramos (2008).

The results that reveal the evolution of the game situations throughout the season demonstrate the progression that exists in the tasks designed for the mini-basketball team. These data are in line with what Ibáñez (2008) and Giménez (2009) point out, which is that employing a constructivist methodology for learning implies a progressive use of the training situations from more simple situations (1-on-0, 1-on-1) to more complex ones (2-on-2, 3-on-3, 4-on-4, etc.). This progression should be applied to the training session, in each microcycle, throughout all periods of a season, and during the entire formative stage of the basketball player (Giménez, 2009; Ibáñez, 2008).

In Figure 2, regarding the U14 team´s tasks, such progression throughout the season is not demonstrated. Likewise, it does not show the group situations which are recommended by Cárdenas (2006) and Ibáñez (2008) for the formative stage in which this age division is located and which would relegate the most complex situations of 4-on-4 and 5-on-5 to the adult stage.

In their study, Cañadas and García (2005) corroborate that this progression in the game situations is found from session to session and throughout the season. Relating it to the expert and inexpert character of the coach, the study by Lemos (2005) concludes that the experts apply this progression in their sessions, though the inexpert coaches do not. This leads us to consider the influence of the education or the experience as a coach or player when designing training sessions.

Experience as a player is an educational means that transmits knowledge, strategy, training resources, etc., and can result in adopting a training model that is not suitable for the context in which it is going to be applied (Jones, Armour, & Potrac, 2003; Lemos, 2005). Coach B´s greater experience as a player may explain the predominance of 4-on-4 and 5-on-5 game situations, which are more typical of a training model for higher age divisions than those studied in this study.

As mentioned previously, there are many variables that affect the coach and determine the way a coach designs practice sessions (Ibáñez, 1997). Therefore, variables such as education and experience as a coach can influence and even explain why a coach has chosen one type of task or another.

Having access to data that describe training situations can help the coach to monitor the training process (Cañadas & Ibáñez, 2010; Ibáñez, 2009).

## CONCLUSIONS

The results demonstrate differences in the type of game situations utilised with each team. Although there are agreements in some types of game situations, the mini-basketball team´s tasks are characterised by individual and group situations, while the U14 team´s situations are individual and team in nature.

Based on the constructivist proposals that have been considered for basketball training, the mini-basketball team´s tasks, with regard to type of game situation, are in line with the utilisation of a comprehensive model based on a constructivist methodology. The U14 team´s tasks are in line with a technical model for teaching team sports.

In the search for possible reasons that explain the differences in the type of game situations utilised for each team, variables such as education and experience as a coach and as a player influence the design of the training tasks. This encourages continued research in this area, combining the analysis of the tasks with the study of the figure of the coach.

This type of study is an important starting point to, on the one hand, become familiar with and analyse how sports training is carried out, marking the need to increase the sample of coaches, age divisions, sports modalities, etc. These studies provide much data from which the reality of sports training can be assessed, in this case, in basketball.

On the other hand, in the realm of a coach´s education, it is an important tool from which the coach obtains information on how to plan and carry out his or her training sessions.

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