



## Analysis of Training Plans in Basketball: Gender and Formation Stage Differences

by

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Scientific literature has stated the presence of various stages in athletes sportive development, with different objectives in each one of them. This should lead coaches to different training plans according to the athlete's formation stage. The aim of this study was to analyse training plans and identify differences in basketball objectives according to formative stages (U'12 and U'14) in boys and girls. A total of 1,976 training tasks were collected and analysed, for a total of four teams (girls and boys of U'12 and U'14 categories) during an entire season. Pedagogical variables, game phases, game situations, training means and content were studied. The results showed significant differences between genders. Girls' teams performed more tasks on offense and technical skills. By contrast, boys' teams performed more defensive tasks and tactical contents. The 1-on-0 and 1-on-1 were the most repeated game situations in all teams. Coaches used different training tasks according to gender and age. In male U'12 teams, drills predominated, whereas in the other categories, games predominated. For boys' teams, the contents were tactical oriented, and for girls' teams, the contents were oriented toward skill acquisition. Studying the pedagogical variables of the training process allowed for identification of the utility of training, assessment, and modification of this process.

**Key words:** sports initiation, early stages, tasks, pedagogical variables.

### Introduction

The different stages through which athletes evolve during their formation in which they acquire and develop skills are a complex process and have been widely studied from different points of view (i.e., psychologically, socially, and pedagogically), making it a multidisciplinary process (Cassidy et al., 2004; Cushion et al., 2006). Elements such as the coach, players, context, and competition are all part of the process and intervene in each of the formative stages of sports development (Cushion et al., 2006). There are several classifications within the stages of sports training in the literature. The first stage of basic training of the fundamentals is proposed for children up to 14 years old, followed

by the stage of profound specialization with a scope of maximum performance from 14 to 18 years old. The end stage is when the international level of competition is achieved (Giménez and Sáenz-López, 2004). Leite et al. (2009) split the first stage into two periods: an initiation stage (from 6 to 10 years old) and an orientation stage (from 11 to 14 years old). Within each of the formation stages, game categories are organized by age. For basketball, categories of U'12, U'14, U'16, U'18 and senior are distinguished. The initiation stage and orientation stage match the U'12 and U'14 categories, respectively. The sports initiation stage is considered general preparation as it is the base for future performance. Researchers focus their

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studies on specialization stages, and with a population of athletes that is already formed, yet little attention is paid to the first formative stages in which training must ensure the optimization of the process today and for the future (Leite et al., 2011b).

To determine how sports training is developed, research suggests analysing training tasks. Specialized studies (Cañadas et al., 2013a) have analysed tasks for different team sports, different formation stages, and coaches with different formation and experience. This type of evaluation provides information about the reality of sports training (Cañadas et al., 2015) and provides knowledge of the practical application for this area. On the one hand, it enriches the basis for training because of the lack of principles the coach uses (Cushion et al., 2006). On the other hand, it has implications for the formation of coaches and, consequently, the players because it involves an assessment and control of the sports training being performed (Cañadas et al., 2013b; Pérez et al., 2003). Studies that analyse the evolution of players (boys and girls) from the formation stages until sports excellence in basketball have shown that there are problems in the continuity of the formation process of the young athlete (Feu et al., 2008; Ibáñez et al., 2010), indicating that this requires analysing how training is being conducted to improve the learning process.

Authors such as Giménez and Sáenz-López (2004) and Ibáñez (2008) proposed a teaching process in sports based on horizontal and vertical planning, which sets teaching-training during different stages and categories of formation. For each category/stage, the contents, strategies, and more appropriate types of game situations are set to organize the process of learning the basics during the entire formative process of the basketball player. The new tendencies of training propose a non-linear pedagogy as an alternative to teaching and learning sports, moving from a repetitive and prescriptive practice to another type in which the protagonists are the interpretations and solutions that athletes give to the modification of tasks and the environment (Lee et al., 2014). Therefore, it is necessary to analyse how training is developed in each of the formative stages using pedagogical variables that define training (Ibáñez, 2008),

particularly in sports initiation stages (Cañadas et al., 2015). The training tasks performed during the sport sessions are tools that the coach uses to develop the abilities and skills of the athletes (Ibáñez, 2008). These tasks involve different learning situations in which athletes manifest their motor responses (Chow et al., 2007; Pinder et al., 2011). Thus, it is necessary to ensure a proper design of training tasks that determine the skills of learners and the quality of training (Chow et al., 2009).

In the basketball teaching field, current trends suggest a comprehensive orientation of teaching and constructivist approach during the first stages of training, focused on learning tactics instead of the technique and offensive contents, with increasing difficulty during sportive formation (Giménez and Sáenz-López, 2004; Ibáñez, 2008). Experts agree that playful situations, similar to the real game, with opposition, competition, and confrontation, using small game situations such as 1-on-0, 1-on-1, 2-on-2, and 3-on-3 are the best for the early stages (Giménez and Sáenz-López, 2004). The use of different game situations evolves during the season and formative stages, moving from the simple to the complex, which favours the learning process (Herbert et al., 2000). The methodological proposals of the experts show how these different pedagogical variables must be addressed, and it is necessary to determine whether these suggestions are applicable on a daily practice.

To the best of our knowledge, researchers have focused their studies on specialization stages, and with a population of athletes that is already trained. There is a lack of attention to the first formative stages, in which the optimization of the training process must be ensured (Leite et al., 2011b). Studies of differences in athlete's training for different genders and particularly during the stages of initiation are also scarce. It is necessary to fill the gap between the initiation and the specialization in order to determine how athletes reach the elite. Therefore, the purpose of this study was to determine whether there were differences in the type of game situations, training means and contents raised in training sessions for teams at different formative stages, namely initiation (mini basketball) and orientation (U'14), and genders (female teams vs. male teams). It was hypothesized that there would be differences in

training between the different formative stages (initiation and orientation) and by gender (male and female).

## Methods

The design of this research is classified as empirical, an associative strategy, and cross comparative with natural groups (Ato et al., 2013).

### *Participants*

Four teams from different game categories, male mini basketball ( $n = 12$ ; age  $11.3 \pm 0.8$  years), female mini basketball ( $n = 11$ ; age  $11.1 \pm 0.7$  years), male U'14 ( $n = 12$ ; age  $13.6 \pm 0.3$  years), and female U'14 ( $n = 12$ ; age  $13.2 \pm 0.5$  years), were included in the study. These teams belonged to the initiation stages (mini basketball U'12) and sports orientation stages (U'14) (Leite et al., 2009). There was a total of 1,976 statistical units analysed, which belonged to all training tasks registered during eight months of sports training for the four teams analysed (451 from male mini basketball, 388 from male U'14, 409 from female mini basketball, and 449 from female U'14). These tasks represented the planned sessions for a season. The four teams belonged to clubs that developed sports initiation from a vertical teaching-learning process and in an educational-formative area. All teams were federated and participated in competition during the season. The coaches who ran these teams were novel (first experience as coaches). They all had the same academic and federal training: graduates from the Science of Physical Activity and Sport and basketball coaches of the first level.

### *Variables*

Two types of variables were presented in the study, descriptive and pedagogical training variables. The descriptive variable, an independent variable, characterized the teams that were targeted for training. In this case, it referred to the category of each of the teams analysed, with the following four subcategories: male and female mini basketball (M U'12 and F U'12) and male and female U'14 (M U'14 and F U'14). The dependent variables, pedagogical training variables, were elements that characterized every task and defined sports training (Ibáñez, 2008). The analysis of these variables and their relationship shows how sports training is performed (Cañadas et al., 2013a, 2015; Ibáñez et al., 2016). The pedagogical training

variables and each of their categories were as follows: i) *Game phases*: there were three categories in this variable, offense phase (training task planned to work on the offensive phase of the game or predominantly offensive contents), defence phase (task to work on the defensive phase of the game or predominantly defensive contents), and mixed phase (task in which both offensive and defensive basics have the same relevance); ii) *Game situations*: which referred to the number of players and the role they played in a particular task, the categories of this variable were 1-on-0, 1-on-1, 1-on-2, 2-on-0, (...) 5-on-6, and others; iii) *Training means*: type of training strategies. This study distinguished between: game (motor activities with a fun, competitive and recreational component), drills (motor situations of an usually analytical nature proposed for improving specific aspects of the game (technical and tactical)), competition (practice situations that involve the confrontation with oneself or with others and that follow a more or less formal regulation) and 'pre' sport (involves the adaptation of the actual sporting manifestation, changing the number of players, track dimensions, and material); iv) *Content type*: nature of the content for which the task was posed, distinguishing whether it had a defensive or offensive content and if it was technical/skill or tactical. The categories were offensive tactical (OT), defensive tactical (DT), offensive technical (OS) and defensive technical (DS) (Ibáñez, 2008).

### *Instruments*

For registration of training sessions, *PyC Basket 2.0* software was used. This software was created for Planning and Control of sports training, it allows to record the planned training based on the characteristics that define the different training tasks. Data from each of the tasks are entered into the program and characterized based on *the Pedagogical variables of training* (Pérez et al., 2003).

### *Design and Procedures*

The training tasks were registered by three external evaluators (A, B, and C). First, evaluators were trained on the instrument and categories that defined the training tasks to eventually analyse the *data quality* (Gorospe et al., 2005).

To determine the quality of data and following the procedures used in studies such as

Gorospe et al. (2005), the *Cohen's kappa* index and *multirater  $k_{free}$*  were calculated to estimate the intra and inter-rater reliability until a qualified "substantial" or "almost perfect" high rate (Altman, 1991), with coefficient values greater than .70 for all variables, was obtained.

#### Statistical analysis

An inferential analysis between the variables under study with the value of *Chi-square of Pearson* was performed ( $\chi^2$ ), which allowed to assess the hypothesis of independence between the categorical variables analysed and the *Cramer's V value* ( $\varphi_c$ ) to determine whether the degree of association between variables was related (Newell et al., 2010). The meaning of each association was analysed using the value of the *adjusted standardized residuals* (ASR) ( $>|1.96|$ ) (Field, 2009). Finally, a correspondence analysis to strengthen the relationships established between the categories of variables was performed. The level of significance was set at  $p < .05$ . All data were analysed with the software package SPSS 22.0.

## Results

The results of the relationship between the variables under study are shown below. Results are organized according to the variables studied, first there are results related to the association of variables with each category, continuing with the study of ASR to confirm the meaning of each of the previous association and, finally, the analysis of correspondence. Table 1 shows a statistically significant relationship between *Categories* and *Game phases*. The distribution of frequencies shows that the number of tasks dedicated to the attack was predominant in every category, and 75% of the tasks analysed were to work on the attack. By contrast, tasks dedicated to work on offensive contents in female mini and U'14 categories represented 94% and 86% of the total, respectively, and were higher than expected, with less offensive tasks than expected in the male mini and U'14 categories.

Figure 1 shows the results of the analysis of correspondence between these two variables. The analysis of correspondence shows that there was a significant relationship ( $\chi^2 = 299.836$ ,  $p = .000$ ), and two dimensions were set with the following values of inertia: dimension 1: 15.2% and dimension 2: .9%. A heterogeneous profile is

shown for trends when designing training tasks directed at each phase of the game of basketball.

Second, the results of the interaction between the variables *Categories* and *Game situations* are presented in Table 2, showing a significant relationship. Individual situations of 1-on-0 and 1-on-1 were the most used game situations in the four categories. In the female mini basketball category, situations of 1-on-0 were used to a greater extent (ASR = 5.4), and in male infant, it was 1-on-1 (ASR = 4.9). For group game situations, in female U'14, situations of 2-on-0 (ASR = 4.6), 2-on-2 (ASR = 2.4), and 3-on-0 (ASR = 2.2) were posed, and in male mini basketball, it was also 2-on-0 (ASR = 3.6) and 3-on-3 (ASR = 2.3). Numerical superiority situations were mainly used in the U'14 categories, highlighting situations of 5-on-4 in males (ASR = 2.6) and 3-on-2 in females (ASR = 2.2). In the male U'14 category, the use of 5-on-5 (ASR = 11.2) was relevant.

The results of the analysis of correspondence (Figure 1) showed that there was a significant relationship between both variables ( $\chi^2 = 78.565$ ,  $p = .000$ ), with two set dimensions with the following values of inertia: dimension 1: 5.8% and dimension 2: 1.8%. Figure 1 presents a homogeneous profile in the use of individual situations by the different game categories. The four categories were associated with situation 1-on-0, particularly for female mini basketball, and with situation 1-on-1. The analysis of correspondence showed that there was a significant relationship between the variables *Categories* and some group and collective *Game situations* ( $\chi^2 = 115.067$ ,  $p = .000$ ), with two set dimensions with the following values of inertia: dimension 1: 24.4% and dimension 2: 7.8%. Furthermore, figure 1 shows a homogeneous profile in the use of some group and collective situations by the male and female U'14 categories and by the male mini basketball category.

In Table 3, the results of the interaction between the variables *Category* and *Training means* are presented. The analysis shows a significant relationship between these two variables. In three of the four categories, the game was the mean most used during training sessions. Only in the male mini basket category, the proportion of drills used was greater than expected. Additionally, in this last category, the use of competition and

“pre” sport was relevant from the rest.

The analysis of correspondence (Figure 1) confirms that there was a statistically significant relationship between these variables ( $\chi^2 = 263.453$ ,  $p = .000$ ), established with the following values of inertia: dimension 1: 14.9% and dimension 2: .6%. The results show the association of the game with the F U'12 category and the M U'14. Drills were associated with the M U'12 category.

Finally, in Table 4, the results of the analysis of the interaction between the variables *Category* and *Content type* are presented. The analysis shows a significant relationship between these two variables. Descriptive results of the relationship between these variables show that male teams presented a balance between technical and tactical contents during the sessions, whereas for female teams, technical work was more important. In the male categories, there was greater concern about the tactics, with a higher

proportion of tasks than expected about offense ( $ASR = 2$ ) and defence ( $ASR = 3.7$ ) in the male mini basket category and defence ( $ASR = 7.8$ ) in the male U'14 category. The female mini basket category was more associated with offensive skills ( $ASR = 10.4$ ), whereas the female U'14 category presented a greater number of tasks dedicated to defensive skills ( $ASR = 2.1$ ).

The analysis of correspondence (Figures 1 and 2) shows that there was a significant relationship between these two variables ( $\chi^2 = 199.949$ ,  $p = .000$ ), with two dimensions with the following values of inertia: dimension 1: 8.6% and dimension 2: .9%.

The results describe a heterogeneous profile in each category. These profiles were made according to the treatment of the different basketball contents. To sum up, results of main characteristics of pedagogical training variables for each category are presented (Figure 3).

**Table 1**

*Relationship between the different categories under study and the treatment of the game phases*

Categories		Phase game		
		Offense	Defense	Mixed
M U'12	% of Categories	62.1%	16.2%	21.7%
	% of total	15.0%	3.9%	5.3%
	ASR	-7.2	2.2*	7.3*
M U'14	% of Categories	51.0%	28.9%	20.1%
	% of total	10.6%	6.0%	4.2%
	ASR	-12.2	10.3*	5.6*
F U'12	% of Categories	94.3%	2.8%	3.0%
	% of total	22.0%	.6%	.7%
	ASR	10.6*	-7.3	-6.6
F U'14	% of Categories	86.1%	8.1%	5.8%
	% of total	27.3%	2.6%	1.8%
	ASR	7.6*	-4.4	-5.6
	% of total	74.9%	13.1%	12.0%
$\chi^2$	<b>299.84</b>			
$\varphi_c$	<b>.284</b>			

\* $>|1.96|$ ; in bold:  $p < 0.001$

**Table 2**  
Relationship between the different categories under study and the game situations

Game situations		Categories			
		M U'12	M U'14	F U'12	F U'14
1-on-0	% of Categories	27.1%	14.9%	38.1%	30.1%
	ASR	-4	-6.4	5.4*	1.2
1-on-1	% of Categories	30.2%	42.8%	34.1%	24.5%
	ASR	-1.2	4.9*	.8	-4.2
2-on-0	% of Categories	8.6%	.0%	2.4%	9.6%
	ASR	3.6*	-5.4	-3.1	4.6*
2-on-1	% of Categories	4.9%	5.2%	5.8%	2.4%
	ASR	.4	.7	1.4	-2.5
2-on-2	% of Categories	6.7%	4.6%	9.8%	10.7%
	ASR	-1.3	-2.8	1.6	2.4*
3-on-0	% of Categories	.7%	1.5%	1.0%	2.4%
	ASR	-1.6	.3	-9	2.2*
3-on-2	% of Categories	2.4%	2.8%	1.0%	4.0%
	ASR	-.2	.4	-2.4	2.2*
3-on-3	% of Categories	9.8%	9.0%	4.1%	6.5%
	ASR	2.3*	1.5	-2.9	-.8
4-on-4	% of Categories	2.4%	3.4%	1.0%	.9%
	ASR	1.0	2.4*	-1.6	-1.8
5-on-4	% of Categories	.0%	.5%	.0%	.0%
	ASR	-.8	2.6*	-.8	-.8
5-on-5	% of Categories	3.3%	14.7%	.0%	.7%
	ASR	-1.3	11.2*	-5.0	-4.5
$\chi^2$		<b>371.13</b>			
$\varphi_c$		<b>.269</b>			

\* $>|1.96|$ ; in bold:  $p < 0.001$

**Table 3**  
Relationship between the different categories under study and the training means

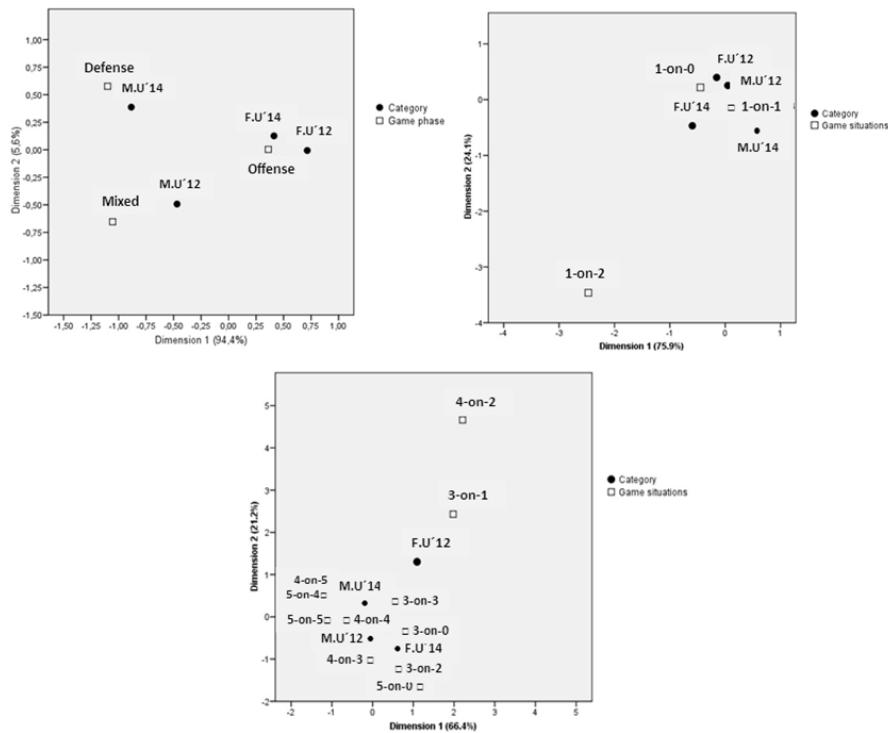
Categories		Training means			
		Drill	Game	Competition	Pre'sport
M U'12	% of Categories	65.6%	27.9%	4.9%	1.6%
	ASR	11.9*	-14.1	7.0*	4.4*
M U'14	% of Categories	24.2%	75.0%	.8%	.0%
	ASR	-8.0	8.5*	-1.3	-1.4
F U'12	% of Categories	33.0%	67.0%	.0%	.0%
	ASR	-4.2	5.0*	-2.8	-1.5
F U'14	% of Categories	41.4%	58.6%	.0%	.0%
	ASR	-.2	1.2	-3.0	-1.6
Total		41.9%	56.2%	1.5%	.4%
$\chi^2$		<b>263.45</b>			
$\varphi_c$		<b>.227</b>			

\* $>|1.96|$ ; in bold:  $p < 0.001$

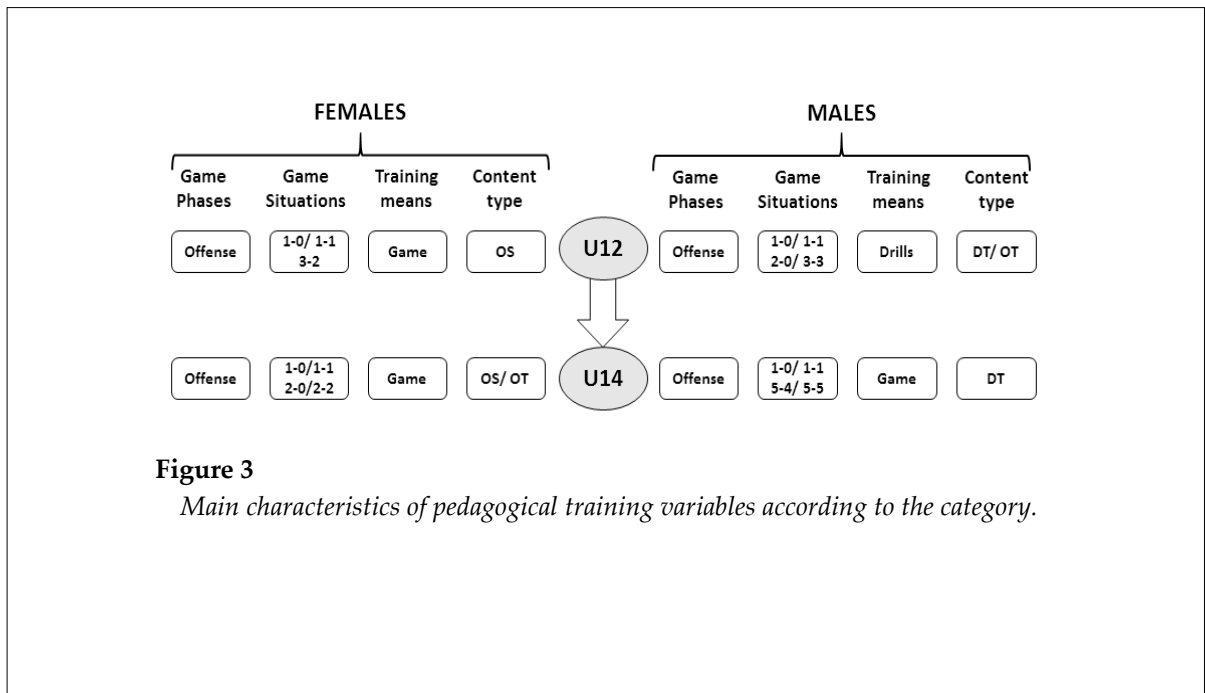
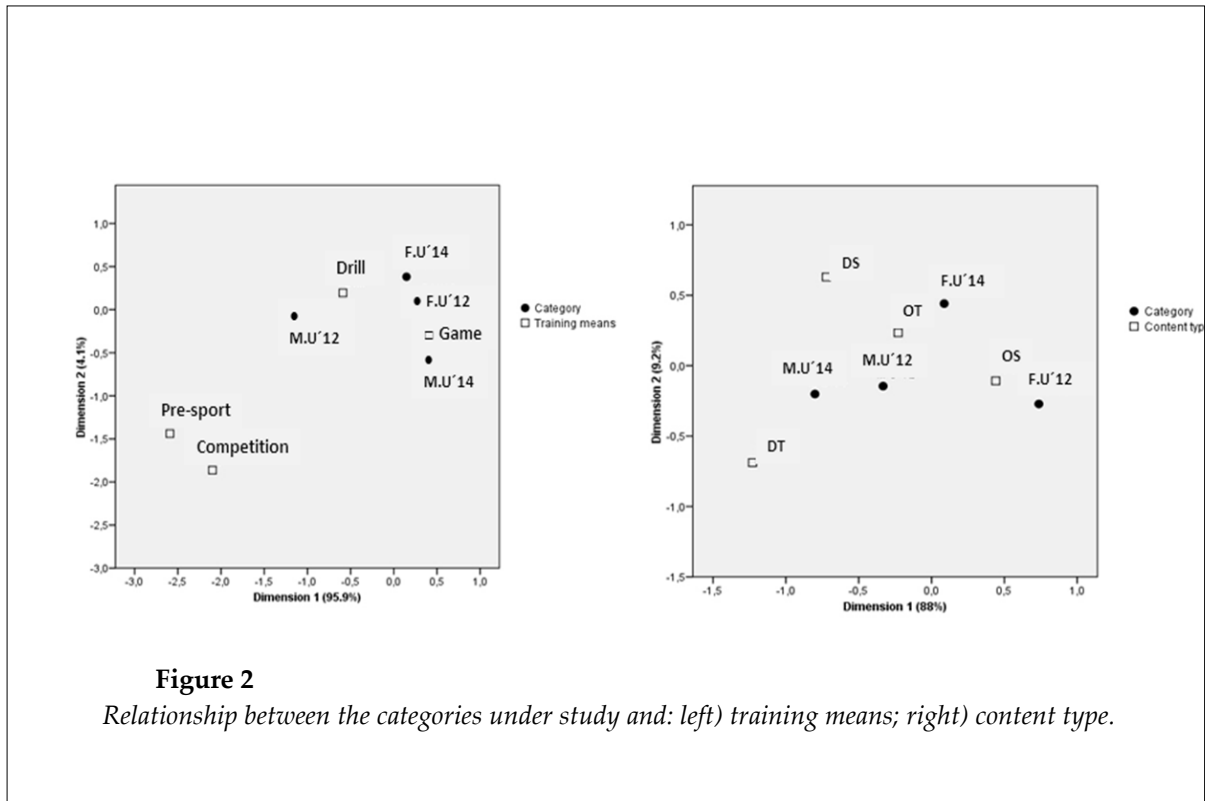
**Table 4**  
*Relationship between the different categories under study and the content type*

Categories		Content type			
		OT	DT	OS	DS
MU'12	% of Categories	35.3%	13.3%	44.6%	6.9%
	ASR	2.4*	3.7*	-4.1	-.5
MU'14	% of Categories	32.2%	19.1%	36.6%	12.1%
	ASR	.8	7.8*	-7.2	3.9
FU'12	% of Categories	22.8%	2.6%	72.1%	2.6%
	ASR	-4.6	-6.1	10.4*	-5.1
FU'14	% of Categories	32.9%	5.3%	52.6%	9.2%
	ASR	1.6	-4.0	-.2	2.1*
<b>Total</b>		<b>30.6%</b>	<b>8.9%</b>	<b>53.0%</b>	<b>7.5%</b>
		$\chi^2$	<b>199.95</b>		
		$\varphi_c$	<b>.180</b>		

\* $>|1.96|$ ; in bold:  $p < 0.001$



**Figure 1**  
*Relationship between the categories under study and: upper left) game phases; upper right) individual training situations; lower) collective game situations.*



**Discussion**

The purpose of this study was to assess basketball training in the early stages of training. It was hypothesized that there would be differences between the various stages of training,

initiation and orientation, as well as gender, either male or female. The results describe a heterogeneous profile of training that is performed in each category based on the different type of content for basketball.

The literature reviewed suggests a



progression of learning in the different formative stages, which leads to different approaches to teaching and training. The formative stage is considered a determinant of training (Cañadas et al., 2013a, 2015). The results of the study show that there are no substantial differences in the approach to training based on the formative stage.

In the study about game phases, for the four categories analysed, the number of tasks aimed at offense was higher, showing the same trend during initiation and orientation (Cañadas et al., 2009, 2015). The specialized literature suggests that the formative stage determines the treatment of the different game phases. The expert proposals agree to dedicate more relevance to offense at the first stages of formation of the basketball player (Giménez and Sáenz-López, 2004; Ibáñez, 2008). In further formative stages, the importance given to defence increases as the players move forward in their formative process (Leite et al., 2009). However, defence fails to acquire the same relevance as offense through the entire formative process of the basketball player. Dedicating more time and tasks to offense can be explained by the aptitude that players show for this phase (Ortega et al., 2009), which would lead the coach to decide what most motivates their players.

For game situations used, the results indicate that coaches favour the development of individual capacity in situations of simple opposition. The 1-on-1 situation is ideal to increase the opportunities for children to play and have the ball (Giménez and Sáenz-López, 2004). The use of 1-on-0 and 1-on-1 is a constant in the categories analysed, with references of their importance in further categories (Cañadas et al., 2013a). The use of game situations without opposition is also common, although proposals recommend avoiding situations that do not develop specific requirements of the actual game (Chow et al., 2007; Pinder et al., 2011). Game situations, such as 2-on-1, 2-on-2, and 3-on-3, acquire importance at the two stages analysed, increasing at the top stage of orientation. These situations provide an alternative to simplify actual game situations without losing contextualization (Serra-Olivares et al., 2015) that is highly used at initiation (Cañadas et al., 2013a).

The use of a constructivist methodology of learning ensures a progressive use of training

situations, evolving from simple to more complex situations. Expert coaches are able to manipulate, modify, and establish limits in game situations to improve the formation of athletes (Clemente et al., 2015). The design of tasks based on their significance, the focus on attention, functional variability, manipulation of limits, and adaptation of answers guarantee the acquisition of sports learning (Chow, 2013). The generic progression of training situations (1-on-0, 1-on-1, 2-on-0, up to 5-on-5) occurs at the session, micro cycle, season, and formative stage (Giménez and Sáenz-López, 2004; Ibáñez, 2008). This progression is seen in the results of this study, at a formative stage, particularly for the male U'14 category in which the use of more complex game situations, such as 4-on-4 and 5-on-5, increases. Finally, game situations, high or low in number, are reduced, and the coaches consider that it must increase from the orientation stage (Leite et al., 2009)

The analysis of training shows that the game is the most used means in three of the four categories analysed, and there is a different trend between the stages of initiation and orientation. Furthermore, the survey results are not consistent with what is customary in teaching of team sports during initiation, with the use of analytical situations, isolated from the real situation (Giménez and Sáenz-López, 2004). The game, however, proposes a situation that favours freedom of the player, the development of creativity and cognition that together with fun, are elements that coaches consider of great importance during the stages of sports initiation (Leite et al., 2011a). Players also appreciate competitive activities that are mentally and physically intense (Chow, 2013) and are more characteristic of the games than analytical exercises. Coaches believe that the formative stage determines the type of strategy to use in training, associating the first formative stages with the game (Cañadas et al., 2013b).

The results do not show different trends for the treatment of the types of content according to the formative stage. Expert coaches believe that the category must determine the type of content (Cañadas et al., 2013b; Leite et al., 2009) so that while the basketball player evolves during the formative stage, a complete formation of all basketball basics is ensured (Ibáñez, 2008). Perhaps this is because these are two formative

stages close to each other and the differences are not yet significant. Leite et al. (2011a) found no significant differences in the treatment of basic technical and tactical defensive and offensive content between coaches in the same formative period. The attack technique is dedicated to a greater number of tasks in all cases. The studies performed during the initiation period confirm greater dedication to the technique over tactics (Cañadas et al., 2015). Current trends for teaching basketball in stages of initiation are based on an alternative methodology with a comprehensive orientation of the sport. This guidance recommends initiating the education/training with tactics and then refining technical gestures to achieve greater efficiency, following the basic outline of teaching games for understanding (TGfU) defined by Bunker and Thorpe (1982). This approach assumes that in the early formative stages, attachment of greater importance to the tactical aspects is granted, leaving technique in the background (Giménez and Sáenz-López, 2004; Ibáñez, 2008).

Gender is another element that has been analysed for its possible influence on planning of sports training. Studies that analyse training tasks are scarce, but in particular, there are none for females. The tasks analysed in this study show gender differences in the treatment of game phases. Female teams had a tendency to work more on offensive fundamentals, whereas males incorporated the defensive phase (Leite et al., 2009). The few references to defence in female basketball players at a high level who were interviewed show the low priority that has been granted during their formative process (Sáenz-López et al., 2007). The fact that girls have later incorporation of basketball training may explain the greater focus on offense compared to the boys, since this is the content to work on especially at the beginning of the teaching process (Giménez and Sáenz-López, 2004; Ibáñez, 2008).

The results also show differences in the treatment of technique and tactics according to gender. Male teams tended to find a balance between the two types of content, whereas for female teams, technique was predominant. The female basketball players interviewed highlighted the large amount of time devoted to technique (Sáenz-López et al., 2007).

The basketball game analysis found

differences in performance by gender. The main differences in the game between men and women are likely a result of their physical characteristics (García et al., 2010; Sampaio et al., 2004). Female coaches may think that lack of strength is supplemented with better technical performance. The existence of gender differences in the participation of activities such as invasion games (Gutiérrez and García-López, 2012) continues to maintain differences in teaching-training according to each group (Oliver et al., 2009) or can eliminate stereotypes by using the same approach (Gutiérrez and García-López, 2012).

This study highlights the need to broaden the understanding of training processes through the analysis of pedagogical variables that define a task. The integration of knowledge from the experience of expert coaches with empirical knowledge is basic to applied research (Greenwood et al., 2014). The results presented in this study provide a promising method for the integration of theoretical and practical knowledge, as well as promotion of this type of applied research to sports pedagogy.

## **Conclusions**

The results of this study show sport training development in the early formative stages according to the category and gender. The most important differences were based on the gender of players. This research allows to determine whether processes of sports teaching at each level of formation are performed properly. It provides a means to analyse the reality of sports training and, from these data, reconsider the principles that currently exist in the formation of coaches/teachers and players/students. The proximity of the categories under study and the age of the athletes may have conditioned the few differences. This highlights the importance of further studies with more distant categories. Empirical knowledge about how to train using educational variables that define a task is critical for coaches to assess and modify their performance.

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