

Effect of Morphophysical and Technical factors on Offensive Tactics in Basket-Ball

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Abstract: Our purpose is to verify if the most optimal training possible of the offensive in Basket-Ball is tributary of the Placed Offensive Systems, or of the Counter Attack, or of the Free Game or a complementarity between two of these three elements or even between the set of these three elements. Our concern is to search the most intelligible and reliable process of Teaching/Training of Attack in Basket-Ball. The best performance in Attack concerning the Basket-Ball discipline is first of all tributary of a complementarity between Placed Offensive Systems and The Free Game, then between Counter Attack and the Free Game taking into account mainly the foundations and the address for the technique, and the effect of surprise and the reading of game for the tactics. Physical qualities are crucial for scoring.

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1.Introduction:

The traditional conception of Basket-Ball, sometimes ardently unintelligible, is often devoid of sense. The player may be interested in the ball or in playing with the ball and may forget innumerable parameters like a neophyte child, and gets lost in the ball without discerning his team mate or his adversary, or the target, or the referee, or the regulations, or the time. Indeed, the modern conception seems to be growing more and more mature because it tries to take into account the set off these parameters, according to the social context with all its components: human, financial, material, physical, tactical, technical and technological. We have selected to deal with this topic to demonstrate how the use of such parameters, notably in Attack helps the game to solve the defensive problems and the Attack device will be more efficient. Two experiments have been undertaken: one in 2007, with pupils of the second cycle of elementary school in Tunis and one in 2008, with students of the High Institute of Sports and Physical Education of Sfax. First of all, we studied the Counter Attack which is fundamental to make the game faster, provide advantage the offensive (the 2 against 1, the 3 against 2: ball to the middle and ball on the side, the 3 against 1, the 3 against 0, the 2 against 0 and the 1 against 0), and the transition. The Counter Attack enhances the general principles (the conquest of the ball, the exit of the ball or the first pass of the Counter Attack, the progression of the ball and

players toward the opponent basket, the fixing of defence before the decisive pass, shooting at the end of the Counter Attack: Counter Attack with rise of the ball in the central passageway and in the lateral passageway). Then, Placed Offensive Systems from two different perspectives: Systems of Attack against the defence of classic zone (2.1.2; 2.3; 3.2 and 1.3.1) and Systems of defence in zone-press (1.2.1.1; 1.2.2; 3.2 and 2.2.1). Finally, the Free Game, in order to encourage individual skills: the support, the revolve, the make-believe, the tipping, the switching, the demarqueage, the reversing, the overflow, the body obstacle, the stack, the pass, the dribble, shooting (in lay-up, in gimlet and with rolled arm) and the tactical individual skills (address, screen, rebound, criss-cross, cut, penetration and one against one). Our objective is to shed light on the three precepts: technical, tactical and morpho-physical, Counter Attack, Placed Offensive Systems and Free Game so that to take the right decision of the offensive mode in the most suitable way in Basket-Ball according to the contingencies of the game. The approach is integrative, mixing the cognitive and the no-cognitive. Experimental, pragmatic and clinical research has been conducted together with an empirical observation derived from the real game during competitions, in Tunisia where I was a player: the "Esperance" team (1980/1986), the national young and junior team (1982/1985). I also played abroad against some French teams (Saint Raphaël: 1983), Russian and other teams from Ukraine

(Chakhteur Donietsk CKA, and Spartak in Moscow and in Vorochilove Grade (1984), and against Solb Annaba in Algeria (1986), Jala of Damascus in Syria (1987) and Tamara and El Jadida in Morocco (1990/1994). Such observations reveal many offensive difficulties and a remarkable dearth in concretisation at two levels: On the one hand, there is a real offensive problem and on the other hand, it is hard to find the appropriate solution. This is due to different controversial factors. Contrarily to Basketball, based on imitation and stereotyping, offensive Basketball, as it is played in the National Basketball Association for example, is based mainly on Counter Attack, and Free Game, and on a didactic approach problematising and optimising individual potentialities for the sake of one's team. Scoring is of crucial importance, reaching and exceeding 100 points. This observation reveals the complex aspect to opt for a pertinent and offensive system to score a lot of points within a limited period of time. Borhane ERRAIES and Alain WEISZ (1984) for instance, put special emphasis upon Placed Offensive Systems without discarding the Counter Attack. However, they underestimate the offensive individual skills. Gerard BOSC and Bernard GROSGEORGE (1985) give much importance to Placed Offensive Systems, Counter Attack as well as to players' physical, psychic and intellectual abilities. The players' relationship with each other, with their coach is also vital as the relationship between teachers and pupils. According to Claude BERGEAUD, coach of the national french Basketball team, a coach must "have convictions and not certainties". S/he can foresee everything but there is always a place for the unpredictable. He states this in a paper entitled "Let's simplify Basketball" that he presented in Yugoslavia in 2006. He also states that spirit of the "game" is dead and we have the "I" instead. This was confirmed in 12/12/2004 in Lyon by the research unit of technical sciences of sportive and physical activities optimising the Free Game. Modern theories, namely, the information theory and connexionism, clearly demonstrate that one person can not and must not think in the place of another. The coach has his role and the players have theirs.

2. Methodology:

Our objective is to study in depth if optimal learning in Basketball offensive is tributary of Placed Offensive Systems or of Counter Attack or of Free Game or of all these elements together as they complete rather than exclude each other. By "learning", we mean all realised and manifested performance, and not a performance that is programmed or expected. Free Game means all the Attack skills based on tactical and technical

individualities highly motivated by psycho-physical skills. Finally, "intelligible and efficient" refer to functionality, operability, efficiency and concretisation relying on managerial didactics (Hameline and Merieu, 1987) and also on organisational methods that are well structured, solid, powerful and enduring. As for hypotheses, we suppose that an Attack that scores is tributary of a certain game system. Besides, the most optimal tactic in Basketball is often due to physiological and or technical mechanisms. Finally, scoring in Basketball mirrors the game rhythm.

Participants:

They are selected arbitrarily and at random without being interviewed. They are also equally distributed because there are so many associated factors that may affect the results such as weather conditions, availability, the intellectual and psychosomatic levels. Motricity in general and more specifically in Basketball and the choice of the teacher and pupils are important. We'd better work with highly motivated pupils without forcing them to participate. We will have 4 groups of 5 pupils each: An Experimental Group, a Witness Group and two other groups in defence. All the pupils come from "Ecole Préparatoire Bir El Kram/El Omrane" in Tunis where I had taught physical education for 7 years. Pupils are aged 13-15 years and they are mixed and the game takes place according to the rules of Basketball. Our first experiment was held in Omrane on May 19th, 2006 from 7h30 a.m. to 1h30 p.m. All was done in one day. We could have experimented in another place but we preferred to work with pupils where didactics is more operational. Some rehearsals, Placed Offensive Systems, Counter Attack and Free Game for Initial and Final Tests were filmed. Such rehearsals are divided into 3 sets of 10 tests each.

Procedures and measures:

Mathematically, the number of probable cases for any positive value "n", different from 0, is 2^n . Three components are taken into consideration in this research: Placed Offensive Systems, Counter Attack and Free Game. So 2^3 is equal to 8 equiprobable cases: Placed Offensive Systems, Counter Attack, Free Game, Placed Offensive Systems + Counter Attack + Free Game, Placed Offensive Systems + Counter Attack, Placed Offensive Systems + Free Game, Counter Attack + Free Game, indecision and nought out of these 8 modalities; we have selected 5 which are closely connected with the two experiments: Placed Offensive Systems, Counter Attack, Free Game, Placed Offensive Systems + Free Game and Counter Attack + Free Game. The task is to apply Placed Offensive Systems when the game

starts and when it is resumed after the free-throw for example. Two parameters are detected:

- 1- Scoring “S” calculated to evaluate Attack efficiency.
- 2- Movement Time “MT” calculated in seconds according to regulations.

The procedure consists in getting the pupils involved in 5 different modalities (see table number 1). Two perspectives are considered: With or without defence in training and with one to one defence in

competition (defensive and offensive rebounds, interceptions, decisive passes, smashes). Rationally, the game must be constantly swift and intelligent. It is ridiculous to launch a Counter Attack to put into practice Placed Offensive Systems. Sometimes, an experienced player who knows his playmates and the opponent team very well may propose efficient offensive solutions that may be more important and useful than those the coach tries to impose.

Table1: Recapitulation table of different experimentation phases.

Type of Attack	CA	POS	FG	FG+ CA	FG+POS
Tests	IT/FT	IT/FT	IT/FT	IT/FT	IT/FT
Experimental Group	3 Sets of 10 attempts for each Test	Idem	Idem	Idem	Idem
Witness Group	Idem	Idem	Idem	Idem	Idem

With: Movement Time (MT), the Score (S) of each attempt for each team, of Experimental Group (EG) and Witness Group (WG). For the Score, the Attack team wears red tee-shirts and the defence team yellow ones. For MT, Attack team players wear yellow colour and the defence team green colour. The defence is half-active. The time separating the Attack that starts at the end line until the shooting of the ball. It has to be less than 24 seconds. Scoring is calculated according to the following grid: successful basket = 3 points; ball touching circle = 2 points; ball touching rectangle (0,59m/0,45m) = 1 point; ball touching rectangle (1,80m/1,05m) = 0,5 point; ball touching nothing = 0 point (out). For the second experiment, a sample of 20 students from ISSEPS where I have been teaching Basket-Ball for 6 years are selected. Such students all boys are divided into 4 teams of 5 each and they are all first year students (LMD System) aged between 18 and 20 years. This experiment was conducted at the ISSEPS in December 2008 and the temperature was 13° C. For technical parameters, there are 10 attempts whereas physical parameters are taken only once. There is a dependent variable (Performance) and independent variables (Tactical, Technical, Morpho-physical). For this second experiment, there are 38 different parameters of which 6 tactical, 1 technical, 13 physical, 5 morphological and 4 mixed (morphological, physical, and technical).

Tactical parameters: CA, POS, FG, FG + CA, FG + POS and Tactical (Tac).

Technical parameters: Free-Throw (FT), Mid-Distance (MD), Running Shoot (RS), 3P (3 points), Shooting (4 types), Pass (SS), Dribble (BB), Rebound (RB), Skills (3 types) and Technique (Tec). Morpho-physical parameters: we may distinguish Detente (D), Vertical Detente (VD), Horizontal Detente (HD), first Coordination (C1), second Coordination (C2), Speed

(Sp), Brachial Force (BF), Abdominal Force (AF), Leg Force (LF), Force (F), Physical Aptitude (PA), and Physical (Phys). There are 5 morphological parameters: Height (H), Weight (W), Wingspan (Wp), Corporal Mass Index (CMI), and Morphological (M). The 4 remaining parameters are the morpho-physical, the technico-physical, the technico-morphological and the technico-morphophysical. Concerning the VD, “Sargent” test is meant to measure the strength of the legs. For the HV, the “Jarver and Bosco” test is used. It also measures the strength of the legs. For Speed, the “Running Anaerobic Sprint Test” (RAST) is used along 35m. 2 tests are used for coordination: “Flamingo or Eurofit” and another test consisting of touching a suspended ball with ball in hand as many times as possible in 20 seconds. To test the strength, we opt for 3 types of exercises: pumps for arms, squats for legs, flexions and extensions of trunk for abdominals. The CMI is Weight/Height^2 . The “Ruffier-Dickson” test is selected to evaluate students’ physical attitude while students make 30 deep flexions in 45 seconds. The teacher examines the pulse (heart beatings) before the exercise (P), immediately after the exercise (P’) and one minute after the end of the exercise (P’'). Physical Aptitude is calculated as follows: $I = P + P' + P'' - 200/10$. -3: excellent; between 3 and 6: good; from 6 to 9: average; 9: insufficient. Data of the second experiment are treated using “Statistica”. The Variant Analysis (ANOVA) is calculated with $P = 0.05$ as the lowest level of signification.

3.Results:

What is the eventual link between the tactical, the technical, the morpho-physical, the morphological and the physical. For the first experiment relating to the tactical with all its forms (CA, POS and FG) and the second relating to the

tactical in relation with the technical and the morpho-physical treated respectively with the helps of SPSS 13.0 and Statistica. The Student test and correlations are used for independent as well as dependent samples and the 5 modalities: CA, POS, FG, FG + CA, FG + POS. A good Basket-Ball offensive depends on FG (0,81 as Correlation Coefficient: CC), POS (CC = 0.75) and POS + FG (CC = 0.76). So, POS and individual skills is the ideal modality for offensive game. There is also a close correlation between the technical (CC = 0.75) and the technico-physical (CC = 0.73). The technico-morphological (CC = 0.59) and the technico-morphophysical (CC = 0.59) are not that very important Whereas coordination (CC = 0.54), Offensive Rebound (CC = 0.59), and Detente (CC = 0.53) are of little significance. The physical, the morphological, the morpho-physical and the shoots (CC = 0.44) are non-significant. The second hypothesis is checked but not the third. In Basket-Ball, Scoring and MT are not proportional statistically and in the reality. For Counter attack of the Experimental Group between Initial Test and Final Test, P of Scoring is 0.000 very significant. For FG combined with POS, Scoring in the Final Test reveals a very significant level too ($P = 0.000$). The Pearson Coefficient is -0.47 and P is

0.03 shows that MT and S are inversely proportional for FG + CA between Initial Test and Final Test. Nonetheless, only Scoring counts in Basket-Ball. Experiment number2 shows that FG in relation with CA generates $P = 0.010$ which is very significant value. The Tactical alone generates $P = 0,02$ which is also very important. Shots analysis shows that P is 0,000, a value of paramount importance. The average for the different parameters concerning shooting are as follows: 2,21 points for MD; 1,79 point for FT; 1,45 point for RS; 1,11 point for 3 point shots. We deduce that the best tactics for the 2 experiments (POS + FG) is highly motivated by technical mechanisms (Rebound and Coordination) and the technico-physical as well as technico-morphological and technico-morphophysical mechanisms. However, the physical, morphological, and morpho-physical are crucial. Qualities such as VD and HD are essential in Basket-Ball and must be used with respect for rules, time and space. The best performance in Basket-Ball Attack is dependent on the couple mentality between POS + FG on the one hand and CA + FG with less importance on the other hand. Technical precision and tactically, the surprise effect and reading the game are of capital importance.

Table 2: ANOVA tactical modalities.

F (4, 76) = 4,4668 p=0,0027					
	CA	POS	FG	FG+CA	FG+POS
	1,92±0,39	1,72±0,43	1,54±0,51	1,96±0,36	1,82±0,36
CA					
POS	0,3754				
FG	0,0107	0,5367			
FG+CA	0,9967	0,2049	0,0036		
FG+POS	0,8855	0,9023	0,1189	0,7039	

Table 3: ANOVA technical parameters (Shooting).

F (3, 57) = 39,6454 p=0,000				
MD	FT	RS	3P	
2,21±0,27	1,79±0,35	1,45±0,42	1,11±0,27	
	FT	MD	RS	3P
FT		0,0013	0,0104	0,0002
MD	0,0013		0,0002	0,0002
RS	0,0104	0,0002		0,0118
3P	0,0002	0,0002	0,0118	

Table 4: ANOVA, average score, gap-types of technical parameters.

F (3, 57) = 2,5189 p=0,0671			
Dribble	Pass	Offensive Rebound	Shootings
2,45±0,94	1,85±1,31	1,85±1,31	1,64±0,16

Correlations: they determine the contingency of the morpho-physical in relation with the technical and the tactical.

Table 5: Correlations between the tactical, the technical and the morpho-physical.

	Tac	Tech	Phys	Morph	Morpho-Physical	Tech-Physical	Tech-Morpho	Tech-Morpho-Physical
Tac	1	,7505***	0,3972	0,2453	0,3224	,7376***	,5923**	,5994**
Tech	,7505***	1	,4937*	,5124*	,5733**	,9735***	,8884***	,8815***
Phys	0,3972	,4937*	1	0,4419	,6655**	,6794**	,5396*	,6556**
Morph	0,2453	,5124*	0,4419	1	,9637***	,5485*	,8495***	,8377***
Morpho-Physical	0,3224	,5733**	,6655**	,9637***	1	,6587**	,8675***	,8923***
Tech-Physical	,7376***	,9735***	,6794**	,5485*	,6587**	1	,8914***	,9161***
Tech-Morpho	,5923**	,8884***	,5396*	,8495***	,8675***	,8914***	1	,9895***
Tech-Morpho-Physical	,5994**	,8815***	,6556**	,8377***	,8923***	,9161***	,9895***	1

4. Discussion:

We have opted for an empirical and experimental research that is characterised by its feasibility within a didactic, managerial and environmental engineering framework based on observation. We worked with a pre-test and post-test protocol with Witness Groups. To check the proportional positive or negative relationship between Scoring and MT, we resorted to the correlational method with the scale [-1,1] and zero is the total absence of any relation. Studying the results in depth reveals that there is no bilateral significance between MT (speed of the game) and Scoring. For example, the CA with P for MT of WG is 0,010 (very significant) has nothing to do with Scoring and does not reflect the specific nature of Basket-Ball which does not seek action or relation speed. Unlike Athletics, Basket-Ball is not evaluated with a chronometer or a decameter. For FG combined with CA, the bilateral significance level P for participants is equal to 0,000 concerning MT and scoring in initial and final tests. Scoring correlation in initial and final tests is about the 0,002. The correlation is almost totally absent. About FG + POS, $P = 0.000$: very significant concerning MT and Scoring in initial and final tests. Regarding the Student test relating to the Experimental Group in CA, statistics demonstrate that for the first 10 rehearsals, the average scoring in the initial test is 1,25 point and 2,10 points in the final test. Space, infrastructure and equipment are essential. Cooperation, mutual understanding and respect, cohesion between learners, teachers, coaches, players, administration and technical staff should not be neglected. With the Experimental Group for instance, we detected the 3 phases of a physical education lesson: the pre-active phase to test the learners' level, the inter-active phase to evaluate competencies and the post-active phase (final) to correct and regulate. According to Michelle VANDEVELDE (1996), such competencies relate to organisation, understanding and action. The success of any sports team depends on so many human and material resources.

Conclusion:

We put the hypothesis of Attack in Basket-Ball depending to a major degree on Placed Offensive Systems, Counter Attack, Free Game or on the combination of all such elements. The best results come first and foremost from the combination of Placed Offensive Systems + Free Game and to a lesser degree from Counter Attack + Free Game. Movement Time and Scoring are not inter-dependent because so many other skills, regulations, and technical, tactical and physical devices are required to have a good control of this fascinating and complex game that is Basket-Ball.

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