Résumé: *Cet ouvrage se propose de relever la complexité et la diversité des informations obtenues- d'une part, de la capacité de mémorisation des entraîneurs- d'autre part, des notices inscrites dans les fiches d'*
observation (phases de jeu, actions tactiques individuelles et collectives) du cadre d'un jeu de handball officiel.
En ce qui concerne la capacité de mémorisation et de stockage des informations visuelles pendant les compétitions, il y a la supposition qu'elle devrait être suppléée par l'usage des fiches d' observation, ce qui assurerait une analyse correcte et efficiente du jeu.
Mots- clés: *handball, entraînement, information visuelle, mémorisation, fiche d' observation.*

IDENTIFICATION BY SPECIALISED VIDEO ANALYSIS OF TECHNICAL MISTAKES RELATED TO THE PROCEDURE IN BASKETBALL THROWING THE BALL FROM JUMPING PROCEDURE

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Abstract:
The article underlines the importance of video analysis programs in the objective detection of technical mistakes within the basic course in basketball. It is based on an extensive experimental study on optimising the technical component in basketball, and also on general aspects regarding the process of professional training in the faculties of sports and physical education for the basic course in the subject of basketball.
Key words: *Video analysis, spatial parameters (segment trajectory), throwing to the basket from jump, technical mistakes.*

INTRODUCTION

The structure and the content of the present analitical programme does not justify the sieting up of the student's demonstrated profile proceeding from the future professional requirement, and the report between theory and practice is no longer well-ballanced, insufficient for the learning and consolidation elements and for the basic technical process, specific to the basketball play. There have always been concerns about the list of specialists with the typology and causality of the technical mistakes in sports games (A. Popescu, 1954; V.V. Belinovici, 1959; A. Hrişcă, C. Negulescu & D. Colibaba-Evuleţ, 1977; R.W. Christina & D.M. Corcos, 1999; A. Păcuraru, L. Călin & G. Prisecaru, 2004; A. Păcuraru, P. Ghervan & A. Acsinte, 2006; C. Ciorbă & I. Comarniţchi, 2007; D.L. Ciocoiu & M. Creţu, 2007; D.L. Ciocoiu, 2009; D.L. Ciocoiu & C. Ciorbă, 2008, 2009; C. Preda & M. Niculescu, 2009; D.L. Ciocoiu, A. Păcuraru, C. Ciorbă & C. Preda, 2010).

RESEARCH HYPOTHESIS

It was presumed that the application of specialised video analysis in the basic course in basketball will increase the efficiency of the methodological approach of learning-consolidation-assessment of the technical procedure called basket, throwing the ball to the basket from jump (the so called "jump shot") by gaining knowledge of the moments composing the movement and by objectively detecting technical mistakes.

PURPOSE

Detection of technical mistakes in the jump shot procedure,in the basic course in basketball by applying video analysis.

RESEARCH OBJECTIVES

1**.** Analysis and generalisation of data in specialised literature.

2. Identification of the main moments in the execution, and common technical mistakes for the given procedure.

3**.** Ascertaining the efficiency of the video method in technique analysis and mistake detection for the given procedure in teaching basketball.

The methods and techniques of scientific research in the present article are as follows: bibliographic documentation, pedagogical observation, video analysis, biomechanical analysis of spatial parameters (trajectory of the movement of segment articulation), constatative experimental study, mathematical statistics, graphics and tables. The specialised video analysis of the jump shot was performed by the *"Physics ToolKitt" - version 6.0* programme, and focused on the trajectory of the

segment articulations in 5 movement points (ankle, knee, hip, shoulder, fist).

The research activity took place in the Faculty of Sports and Physical Education and the Phoenix Sports HighSchool Club in Galati. The subjects were 10 students of the Faculty of Sports and Physical Education, selected on the basis of the average grades between 7.40-7.84 obtained in testing the technical procedures, and 3 high performance athletes of the Phoenix Club, Galați.

RESULTS

The presentation and interpretation of data provided by the specialised program of video analysis, which confirmed the research hypothesis, will be exemplified in the execution of a student, randomly selected out of the 10 participants.

Determining the trajectory of the movement of segment articulation in executing the procedure of basket shot from a standing position for the executing student is shown in Figures 1-2 and Table 1, providing the possibility to observe the position indicator on the horizontal (*Xm*) and vertical (*Ym*) axis.

Figure 1. Movement points at the level of the fist and shoulder articulations student execution

Figure 2. Movement points at the level of the the hip and knee articulations - student execution

Table 1. Data and coordinates during student evolution

a) for the fist

Time	The data coordinates for the fist in all five moments					
t(s)	X1(m)	Y1(m)	R1	Dx1(m)	Dy1(m)	D1(m)
0,00E+00	0,425	0,947	1,038	0,00E+00	0,00E+00	0,00E+00
3,30E-02	0,646	1,08	1,259	0,221	0,133	0,258
6,70E-02	0,682	1,39	1,548	0,257	0,443	0,512
1,00E-01	0,77	2,205	2,335	0,345	1,257	1,304
1,33E-01	1,045	0,938	1,404	0,62	-8,85E-03	0,62

b) for the shoulder

Time	The data coordinates for the shoulder in all five moments					
t(s)	X2(m)	Y2(m)	R2	Dx2(m)	Dy2(m)	D2(m)
0,00E+00	0,212	1,39	1,406	0,00E+00	0,00E+00	0,00E+00
3,30E-02	0,301	1,266	1,301	0,089	-0,124	0,152
6,70E-02	0,372	1,319	1,371	0,159	-0,071	0,174
1,00E-01	0,682	1,709	1,84	0,469	0,319	0,567
1,33E-01	0,779	1,355	1,563	0,567	-0,035	0,568

c) for the hip

Time	The data coordinates for the hip in all five moments					
t(s)	X1(m)	Y1(m)	R1	Dx1(m)	Dy1(m)	D1(m)
0,00E+00	0,186	0,903	0,922	0,00E+00	0,00E+00	0,00E+00
3,30E-02	0,336	0,797	0,865	0,151	-0,106	0,184
6,70E-02	0,372	0,823	0,903	0,186	-0,08	0,202
1,00E-01	0,646	1,204	1,367	0,46	0,301	0,55
1,33E-01	0,77	0,885	1,174	0,584	-0,018	0,585

d) for the knee

Time	The data coordinates for the knee in all five moments					
t(s)	X2(m)	Y2(m)	R2	Dx2(m)	Dy2(m)	D2(m)
0,00E+00	0,425	0,531	0,68	0,00E+00	0,00E+00	0,00E+00
3,30E-02	0,558	0,487	0,74	0,133	-0,044	0,14
6,70E-02	0,584	0,514	0,778	0,159	-0,018	0,16
1,00E-01	0,708	0,823	1,086	0,283	0,292	0,407
1,33E-01	0,859	0,584	1,039	0,434	0,053	0,437

e) for the ankle

Time	The data coordinates for the ankle in all five moments					
t(s)	X1(m)	Y1(m)	R1	Dx1(m)	Dy1(m)	D1(m)
0,00E+00	0,46	0,106	0,472	0,00E+00	0,00E+00	0,00E+00
3,30E-02	0,469	0,097	0,479	8,85E-03	-8,85E-03	0,013
6,70E-02	0,469	0,089	0,478	8,85E-03	-0,018	0,02
1,00E-01	0,646	0,363	0,741	0,186	0,257	0,317
1,33E-01	6,99E-01	0,133	0,712	0,239	0,027	0,241

The graphical representation of segment trajectory in the 5 essential points of the student's movement allowed the inclusion of the global execution into a synthetic, easily observable form (Figure 3).

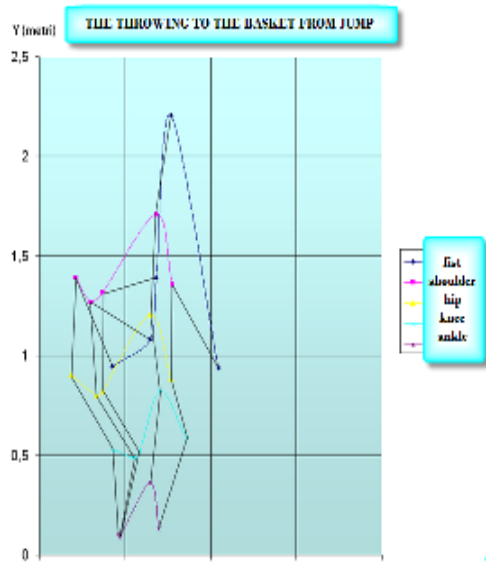

Figure 3. Graphical representation of segment trajectory in the 5 points of the given technical procedure - student execution

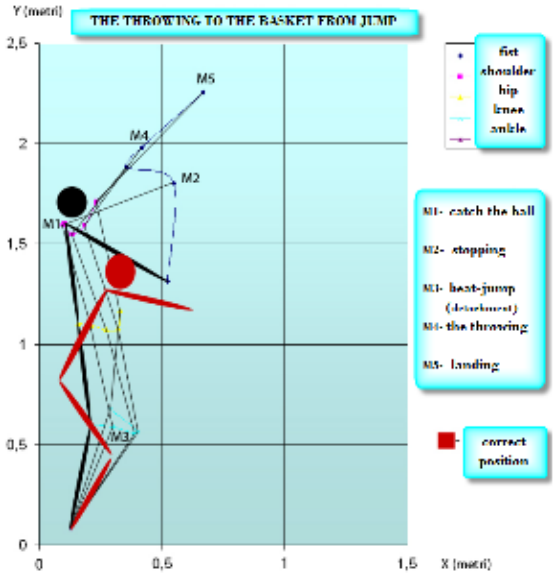

Figure 4. Comparative analysis of the evolution of segment trajectory in the given procedure - student execution

The identification of the main moments in the execution of the procedure under study is focused on: **M1**-catching the ball; **M2**-stopping; **M3**-beat-jump (detachment); **M4**-throwing; **M5**-landing.

For the objective detection of technical mistakes, the student's execution was compared to the execution of a high performance athlete, taken as a model. The comparative analysis of the execution of the procedure under study was made by superposing the two initial positions (student and athlete) wherefrom the segment displacement was effected during the execution (Figure 4.).

The common technical mistakes seen during the acquisition of the sequential stages of the technical procedure were synthesized in Figure 5.

CONCLUSIONS

1. The program has contributed to evincing the main moments in performance and the detection of technical mistakes improving the progress of the technical training of the student in this throwing procedure.
2. The video analysis method ensured the interactivity during the lessons and the students' motivation.
3. The specialized software of biomechanical analysis of spatial parameters (segments trajectory) has also allowed the observation of body segments which are differently involved (as percentage) in the procedure of throwing the ball from jumping.
4. The combined use of video and traditional methods was a safe way to effectiveness in the methodological path of learning-consolidation-assessment-detection-prevention-correction, providing objective solutions for the teacher and also for the students in the given procedure.

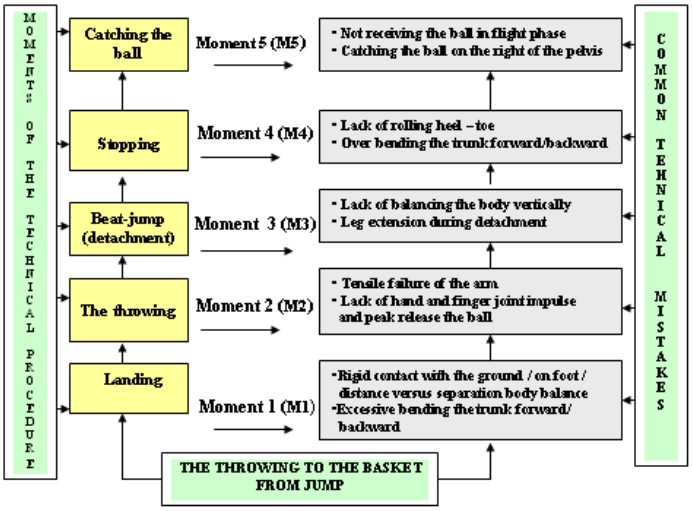

Figure 5. Common mistakes in the technical execution of jump shot

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IDENTIFICATION PAR ANALYSE VIDEO SPECIALISE DES FAUTES DE TECHNIQUE POUR LA PROCEDURE LANCER LE BASKETBALL AU PANIER

Résumé

Cet article souligne l'importance des programmes d'analyse video pour la depistage objective des erreurs de technique pour le cours – discipline basketball. Cet-ci a pour base un etude experimental ample, parlant de l'optimisation de la componente technique dans le jeu de basketball mais aussi des aspects generaux regardant le proces de preparation professionelle des etudiants de la Faculte d'Education Physique et Sport au discipline «Basketball» cours de base.

Mots cles: *analyse video, parametres spatieux (les segments de chemin d'accès), jetter au panier en dribling, preparation technique, fautes de technique.*