

Expert Model of Decision-Making System for Efficient Orientation of Basketball Players to Positions and Roles in the Game – Empirical Verification

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ABSTRACT

The purpose of the research was to empirically verify the expert model system designed for more efficient orientation of basketball players to particular positions and/or roles in the game (specialization). Participants were 60 randomly chosen male basketball players (12 players per each position) from the 12 Croatian 1st league teams in season 1998/99. Data were gathered from 10 basketball coaches who estimated overall performance (actual quality) of players on defense (7 variables) and on offense (12 variables). Variables were established by Trninić, Perica and Dizdar¹. A measure of body height was added to the aforementioned group of variables. The results obtained suggest that the proposed decision-making system can be used as an auxiliary instrument in orienting players to the positions and roles in the game. It has been established that the players have attained the highest grades of overall performance exactly at their primary playing positions in the game. The largest differences were determined between point guards (position 1) and centers (position 5). The greatest difficulties have occurred in determining optimal position for small forwards (position 3), then for shooting guards (position 2) and, last, for power forwards (position 4), because all these basketball players are the most versatile ones. Therefore, reliability of the system is the lowest when it is applied for selecting and orientating players to these positions. Convenient body height significantly contributes to aptitude of these players to play multiple positions and to assume multiple roles in the game. This research has reinforced the thesis that body height is a variable with the greatest influence on orientation of players to particular positions and roles in the game.

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Introduction

Three processes are going on, more or less interwoven, throughout a longer period of basketball career and training: process of orientation, process of training and process of selection (Figure 1). The training process is a continuous one, while both the selection and orientation processes are executed at certain points during the sports career.

Orientation of athletes is a process of classification of children or players into groups according to chosen criteria, which are distinguished by certain important

attributes. One must distinguish orientation of talented children to basketball from orientation of players to the most appropriate roles in the game (specialization).

The initial orientation, the first guidance to a particular sport, is a process of classification of talented children in groups according to their capacities and attributes (aptitude) that are congruent to differentiating attributes important to the respective sport (Figure 2). Following the first orientation, children are engaged in basic (universal, versatile) training process, being typical (specific) for a certain sport^{3,4,5}.

AGE-CATEGORIES	Process of multi-lateral (versatile) training and specialization	Process of orientation to the basketball and to position/roles in the game	Process of selection
above age of 20 ↑ seniors	functional training		for the senior team members 6 th phase ↑
20 years of age ↑ 19 years of age junior men	multilateral and intensive specialized training	intensive orientation to more and less defined roles in the game (specialization)	for the junior men team members 5 th phase ↑
18 years of age ↑ 17 years of age young men	multilateral and intensive specialized training	intensive orientation to more and less defined roles in the game (specialization)	for the young men team members 4 th phase ↑
16 years of age ↑ 15 years of age cadets	multilateral and introductory specialized training	orientation to the less defined (general) roles in the game	for the cadet team members 3 rd phase ↑
14 years of age ↑ 13 years of age older boys	versatile, universal (basic) basketball training	discovering unique attributes in the play of an individual (regardless of skill and knowledge)	for the older boys team members 2 nd phase ↑
12 years of age ↑ 11 years of age younger boys A	versatile, universal (basic) basketball training		for the younger boys team members 1 st phase ↑
10 years of age ↑ 9 years of age younger boys B	introductory basketball training	recognizing gifted children for basketball	mini-basketball
		orientation ↑ of motor skill gifted children to basketball	

Fig. 1. Model of the training process, selection, and orientation (modified according to Dežman, 1988)².

Player / Sport	Basketball	Swimming – Short Distances	Gymnastics
A	3	4	2
B	5	4	1
C	2	3,5	4
D	1	2	5
E	4	5	1

aptitude and adequacy for a particular sport (orientation);
prospects in the particular sport (selection).

Fig. 2. Example of orientation of children to selected sport (modified according to Dežman, 1998)⁶.

The second orientation (or specialization) is a process of classification of players in groups differentiated by important attributes that distinguish particular types of players (Figure 3). Types of players are groups of players made up on the basis of their most similar attributes and abilities that enable them accomplishing one, two or even three roles in the game. There are three basic types of players in basketball: guards, forwards and centers, distinguished among themselves by certain abilities, attributes, knowledge and skills. Beside the basic types of players, the number of semi-universal (shooting guard, power forward) and universal or polyvalent, versatile types of players is growing constantly. Various types of players assume various roles in the game and, consequently, within these roles they accomplish various tasks and, eventually, particular jobs at usual parts of the court (cen-

ters mainly in the key, perimeter players outside the key). Universal and versatile types of players have such a structure of knowledge, skills, abilities and attributes that allows them to play multiple positions in the game^{2,7-10}.

Following the orientation process, the introductory specialised training process is introduced, aimed at educating players to perform their tasks in the game. These tasks are typical, specific for a certain type of player or for a role in the game. Tasks or assignments in the game, comprised within a role, can be recognized as general or special, on the one hand, and individual or collective assignments within phases and concepts of play, on the other. General tasks regard all players assuming the particular role, whereas special tasks are related to specific characteristics of an individual player. Orientation to positions and/or roles (or spe-

Player / Role in the game	Guard	Forward	Center
A	2	3,5	4
B	3	4	2
C	5	3	1
D	1	3	5

aptitude and adequacy for a particular role in the game (orientation);
prospects in the particular role in the game (selection).

Fig. 3. Example of orientation and selection of basketball players.

cialization) is a dynamic process which may last throughout the whole sports career, because a player can transform his play from one into another type through the suitable training process and development and/or to change or expand his role in the game.

It is of a high importance that coaches find out for each player which roles in the game are best suited for him, or where he is the most valuable to the team. At the same time, experts must find out in what direction to develop a certain player's role, to allow him to be the most efficient under the most severe competition conditions. Level of skills and technical-tactical knowledge of the game on both offense and defense in individual and team play have great importance in changing of player's roles, since they are the prerequisites for successful adjustment and the basis of situation-related efficiency, and overall performance, eventually, of a player. If a player possess consistent and wide network of skills and knowledge, his transition from one to another role will be quicker and more successful.

Selection is a process of periodical choice of best players in different phases of their sports development. It is a pedagogical process closely linked with the basic and special training processes. It is executed at least two levels. The first level of this process is a continuation of the process of orientation of children to a certain sport. Through selection from the group of children that have been directed to basketball, the most successful ones are selected. The first step in the selection process is linked to the basic training process.

The second level of this process is a continuation of the process of orientation of young players to the most suitable roles for them. From the group of young men who were oriented to a certain role in the game, the most successful ones are

selected. This is linked to the phase of the specialised training process.

The common task of both orientation and selection is an adequate guidance, distribution of players to the positions and roles in the game they are apt to. That allows for establishing balance between demands of certain assignments in the game, on the one hand, and anthropological profile of a certain player, on the other. Proper orientation and selection of players, along with the high quality training process, represent a basis for achieving top results. In these processes, a coach should take into account variables that define potential and performance. He should use multiparameter expert models for evaluation of partial and total potential and those models for evaluation of the game efficiency and, finally, overall performance (or actual quality).

Attributes and evaluation of potential quality of basketball players and their overall performance or actual quality

Evaluation of quality of a basketball player can be conducted by a means of evaluation of his/her anthropological attributes (potential quality) and/or by evaluation of his/her overall performance (or actual quality).

Potential quality of basketball players is a level of development of basic and specific anthropological attributes that basically determine his/her playing efficiency and overall performance (actual quality of basketball players), eventually manifested on the court.

Previous research studies have proposed and tested several multiparameter models for evaluation of partial potential of basketball players^{3-5,11-13}. Results obtained show great correlation of partial potential with playing efficiency in the game. Therefore, coaches can use them as an instrument in orientation and selec-

tion of players and in managing the training process.

Evaluation of players' *overall performance* (actual quality) is a systematic description and assessment of actual qualities that players manifest in the game¹.

Partial playing efficiency is related to the variables that are recorded by the official game statistics as data on closing actions players perform in the game (indicators of the situation-related efficiency). It is called playing efficiency or player's effectiveness in various situations^{9,11,13–16}.

Insight into *overall performance* (or actual quality) of players is composed of

all relevant variables of actual quality of basketball players manifested in a game or in a competition, evaluated by experts using certain system of criteria.

A group of researchers, under the leadership of Trninić, set a basis for examination of total performance^{10,1,17,18}. Based on the results of these research, the model of expert system for evaluation and analysis of the structure of actual quality of players (overall performance) was designed. The same model is applicable to guiding players more successfully to the most adequate positions and roles in the game (Figure 4).

	P1	P2	P3	P4	P5		Type of a player
Overall Performance	100	100	100	100	100	OU	grade for the overall performance (actual quality) of basketball players across positions
Defense	50	50	50	50	50		grade for the performance on defense
— RPO	13,5	11,7	10	8,0	7,5	P↑	level of defensive pressure
— PO	8,7	9,0	8,3	9,0	9,3	P↑	defensive help
— BŠ	3,4	4,1	4,6	5,9	7,7	P↑	blocking shots
— OL	9,9	9,1	7,7	5,7	5,4	P↑	ball possession gained
— SUO	5,2	6,5	9,7	13,6	14,0	P↑	defensive rebounding efficiency
— UTO	9,5	9,3	9,6	7,8	6,1	P↑	transition defence efficiency
— IVPO							playing multiple positions on offence
Offense	50	50	50	50	50		grade for the performance on offense
— KL	6,5	3,5	3,0	2,7	3,0	P↑	ball control
— VD	6,9	4,0	3,7	3,4	3,4	P↑	passing skills
— PL	5,9	6,0	5,5	4,9	5,5	P↑	dribble penetration
— ŠVP	6,1	7,1	6,5	4,1	2,4	P↑	outside shots
— ŠUP	3,3	3,9	4,9	6,4	6,8	P↑	inside shots
— SB	3,9	4,9	4,1	5,0	5,4	P↑	free throws
— IOP	4,0	4,6	4,6	4,7	5,1	P↑	drawing fouls and three-point play
— PUB	2,3	2,4	3,0	5,1	5,3	P↑	efficiency of screening
— NLB	3,5	5,4	4,9	3,4	3,6	P↑	offense without the ball
— SUN	1,9	2,4	4,4	6,7	7,0	P↑	offensive rebounding efficiency
— UTN	5,5	5,8	5,2	3,8	2,6	P↑	offensive rebounding efficiency
— IVPN							playing multiple positions on offense

On the left side of the table the structure of the tree is shown. In the second, third, fourth, fifth and sixth column are weights (ponders). In the seventh column the relation is determined between results achieved in a particular criterion and overall performance in basketball (OU). That relation is of a progressive (P) nature.

Fig. 4. Decision-making model for evaluation of overall performance or actual quality (modified according to Trninić and Dizdar, 2000)¹⁷.

Due to high complexity of the basketball game and variety of roles in the game, the structure of both the potential (potential quality) and overall performance of one player differ from the structures in other players. It means that players can achieve the same level of potential, playing efficiency and, eventually overall performance through different ways, that is the specific structure of variables of a particular player's potential determines specific structure of variables that define his/her overall performance. Therefore, to direct training process efficiently, not only the end values of potential or performance are important, but the profile (structure) of factors that determine them seems to be even more significant.

This problem can be resolved by means of multiparameter decision-making systems or expert systems. In hierarchical structure of these systems positions and values of main factors are clearly visible, as well as factors at all other levels of the described system, and their correlation with the performance of players.

Figure 4 presents a decision-making system for assessing and analysing the structure of overall performance (actual quality) of basketball players, that can help in more efficient orientation and selection of basketball players, and for more rational management of the training process.

The purpose of this article is to test empirically applicability of this expert system to more efficient orientation of players to their positions in the game.

Materials and Methods

Sample of participants

The test sample consisted of 60 randomly selected players (12 per a position in the game) from the 12 basketball clubs (Cibona, Zadar, Benston, Split, Zrinjevac,

Zagreb, Šibenik, Svjetlost Brod, Kandit Olimpija, Telekom, Croatiline and Vajda) that were competing in the Croatian first league in the season 1998/99.

Sample of variables

To assess the actual quality or overall performance of basketball players the variables – criteria established by Trnić, Perica and Dizdar¹ were used. Here are variables (criteria) to evaluate actual quality of basketball players on defense:

- level of defensive pressure (RPO)
- defensive help (PO)
- blocking shots (BŠ)
- the ball possession gained (OL)
- defensive rebounding efficiency (SUO)
- transition defense efficiency (UTO)
- playing multiple positions on defense (IVPO)

Variables (criteria) to evaluate actual quality of basketball players on offense:

- the ball control (KL)
- passing skills (VD)
- dribble penetration (PL)
- outside shots (ŠVP)
- inside shots (ŠUP)
- free throws (SB)
- drawing fouls and three-point plays (IOP)
- efficiency of screening (PUB)
- offense without the ball (NLB)
- offensive rebounding efficiency (SUN)
- transition offense efficiency (UTN)
- playing multiple positions on offense (IVPN).

Data collection methods

The ten basketball coaches, experts who were training aforementioned teams, assessed performance of 60 players by the following grades:

- 1 – very poor (far below average quality level)
- 2 – poor (below average quality level)

- 3 – good (average quality level)
- 4 – very good (above average quality level)
- 5 – excellent (far above average quality level).

Each coach first classified his players in accordance to the position they predominantly play. Then they evaluated the actual quality (overall performance) of all 60 players with regard to the 19 criteria describing overall performance (7 for defense and 12 for offense).

Data processing methods

Data gathered from 10 coaches have been processed in three stages:

The first step – the initial matrix was formed by finding arithmetic mean of grades given by 10 coaches for each criterion.

The second step – average grades given by 10 coaches in criteria that make up the expert system (criteria *ability to play multiple positions on defense* and *ability to play multiple positions on offense* were excluded) were weighted by the coefficients of importance for particular positions in the game as proposed by Trninić and Dizdar¹⁷. Evaluation of overall quality of players on defense was executed by the following operation:

$$UKI_0 = S_0 P_0$$

where:

UKI_0 – is the matrix of overall quality of players on defense, regarding all positions in the game;

S_0 – is the matrix of average grades for all players in 6 variables describing quality of their defensive play;

P_0 – is the matrix of weights (importance coefficient) of 6 criteria to evaluate quality of defensive play for particular positions in the game.

Evaluation of overall quality of play for players on offense was executed by the following operation:

$$UKI_N = S_N P_N$$

where:

UKI_N – is the matrix of overall quality of players on offense, regarding all positions in the game;

S_N – is the matrix of average grades for all players in 11 variables describing quality of their offensive play;

P_N – is the matrix of weights (importance coefficient) of 11 criteria to evaluate quality of offensive play for particular positions in the game.

The third step – the overall quality of players on both defense and offense was determined by the following operation:

$$UKI = UKI_0 + UKI_N$$

where:

UKI – is the matrix of overall quality of players, regarding all positions in the game;

UKI_0 – is the matrix of overall quality of players on defense, regarding all positions in the game;

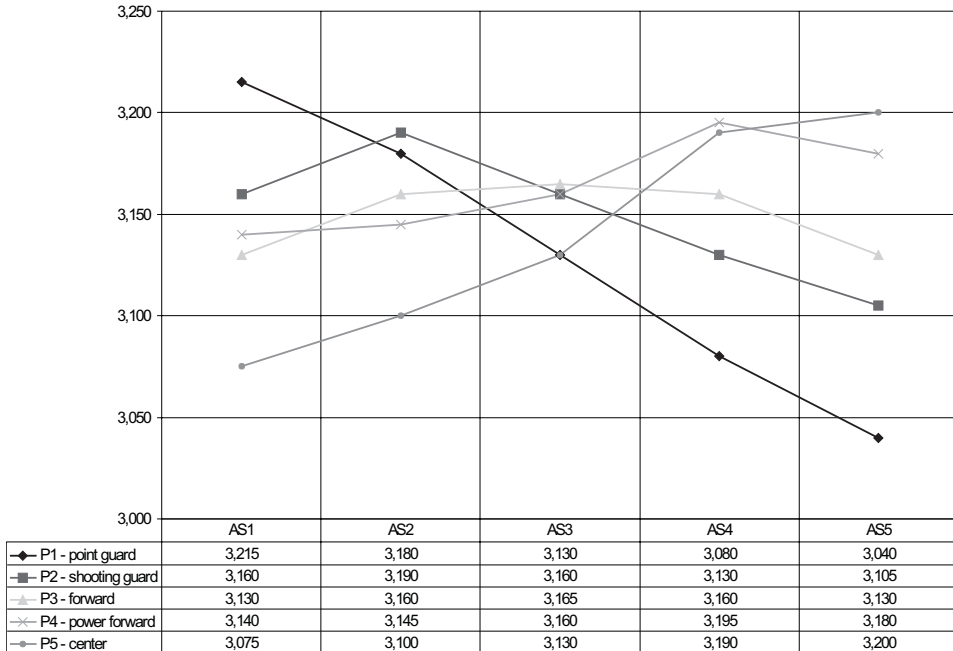
UKI_N – is a matrix of overall quality of players on offense for all positions in the game.

On the basis of so obtained grades for overall quality of basketball players, which regard all positions, the average grade of overall quality for each position was calculated. Additionally, average values in variables *ability to play multiple positions on defense and offense* (IVP) and *body height* (TV) were calculated separate for each position.

Results and Discussion

On the basis of Graph 1 and Table 1, which represent average grades of overall performance, it is obvious that players have attained the best grades for the play at their primary positions in the game. The average grades of overall performance for the position 2 players (shooting

GRAPH AND TABLE 1
 AVERAGE GRADES OF OVERALL PERFORMANCE (ACTUAL QUALITY) OF PLAYERS WHO
 PRIMARILY PLAY AT A CERTAIN POSITION IN THE GAME



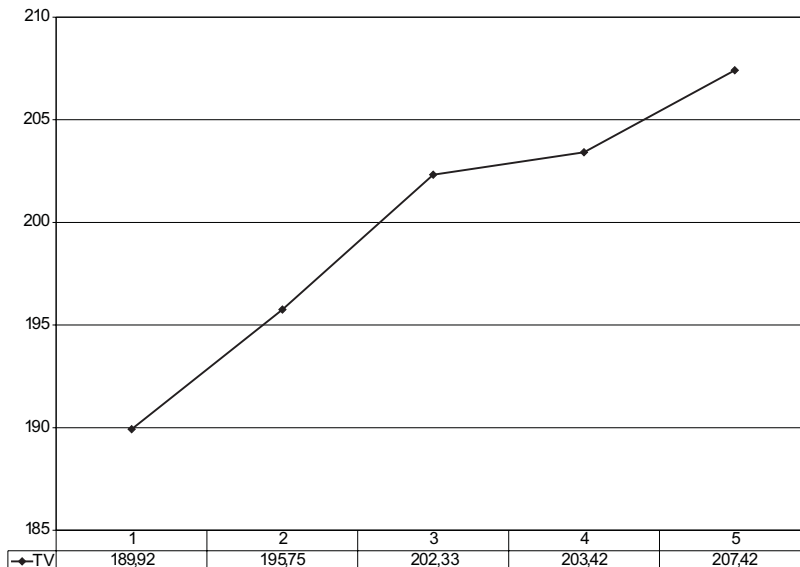
guards) indicate it is much harder to assess their optimal position than for players at position 1 (point guard). Shooting guards' average grades show that they are versatile players who can equally accomplish their specific assignments, as well as assignments usually designated both to point guards – 1 and small forwards – 3. It is even harder to make optimal assessment for the position 3 players (small forwards). These players have almost equal overall grades as the position 2, 3 and 4 players, since they are the most versatile players. Due to that, selection of their positions by means of the proposed system is least reliable. Average grades of inside players at positions 4 and 5 (power forwards and centers) reveal they are well distinguished from the perimeter players, but the interdifferences are not so obvious between these two positions (4

and 5). It is due to the fact that the players who primarily play these two positions, regarding their coefficients of importance, are differentiated among themselves only by the higher significance of the variable *outside shot* for the position 4 players, when compared to centers.

Therefore authors suggest introduction of additional relevant parameters for more reliable orientation of players to their optimal positions. For example, the orientation reliability can be significantly increased if the variable *body height* is included into the system of evaluation criteria.

It can be seen from Graph and Table 2, showing average body height of players on particular positions, that the body height values significantly distinguishes players per positions in the game. The lowest average values are for position 1

GRAPH AND TABLE 2
 AVERAGE VALUES OF BODY HEIGHT MEASURES FOR PLAYERS AT THEIR POSITIONS
 IN THE GAME



(189.9 cm), whereas the highest are for position 5 (207.4 cm). These results are congruent with the research conducted by Trninić, Dizdar, Jaklinović¹⁶. The differences among guards, forwards and centers in certain anthropometric attributes (body height and body mass) and indicators of situation-related efficiency (play efficiency) are described in the research. The results have revealed that the body height values primarily define positions, roles, tasks and assignments in the game, being in turn clearly manifested in the standard indicators of situation-related efficiency. Therefore, body height has great importance in specialization or orientation of players to certain positions.

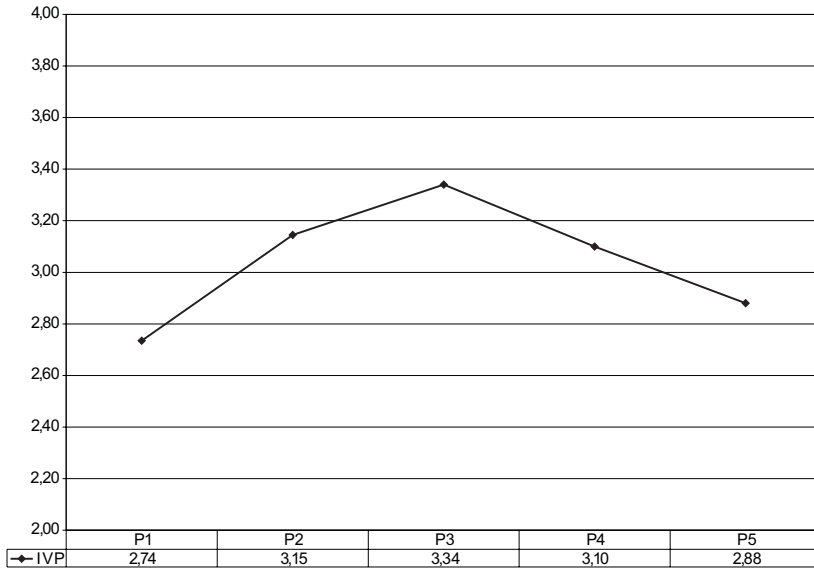
Subjective evaluation of players' versatility or ability to play multiple positions can also significantly increase reliability in orienting players to the most appropriate game positions. Graph and Table 3 clearly show that the highest av-

erage grades were given to the position 3 players, followed by the position 2 and 4 players, whereas the lowest grades were given for the position 1 and 5 players. The obtained grades are in accordance with the overall performance grades obtained in this research through the 17 criteria (6 for defense and 11 for offense). The variability of grades is the lowest for the position 3 players; it is somewhat higher for the position 2 players, and it is the highest for the position 1 and 5 players.

Conclusion

The purpose of the research was to empirically verify applicability of a multi-parameter decision-making system for more efficient orientation of players to particular positions and/or roles in the game. Ten basketball coaches evaluated overall performance (actual quality) of 60 players, randomly chosen from the 12

GRAPH AND TABLE 3
 AVERAGE GRADES OF PLAYERS FOR THE CRITERION PERFORMANCE ON MULTIPLE POSITIONS
 ON BOTH DEFENSE AND OFFENSE



teams from the Croatian first league in the season 1998/99. Performance was assessed according to 19 variables for evaluation of actual quality of basketball players established by Trninić, Perica and Dizdar in 1999. It was established that players have got the highest grades of overall performance, calculated by the proposed decision-making system, at the very position they primarily play. As expected, the greatest differences were determined between the players primarily playing positions 1 and 5. The most difficult evaluation was for players at the position 3, then for positions 2 and 4. Players at these positions are versatile ones, therefore the selection and assignment of the position to each of them are least reliable when the proposed system is employed. The thesis has also been confirmed that the variable *body height* has the greatest weight in orientation of players

to the most appropriate positions and/or roles in the basketball game.

The results obtained in this research suggest that:

- the decision-making system, used here to evaluate overall performance (actual quality), distinguishes players per positions (roles) in the game, therefore it can be used as an auxiliary instrument in orientation of players to the most adequate positions and/or roles in the game;
- for successful orientation of players additional variables (body height, in particular) or decision-making models (e.g. the player potential evaluation model) are recommended;
- the proposed model should be tested on the sample of young basketball players (cadets and juniors).

REFERENCES

1. TRNINIĆ, S., A. PERICA, D. DIZDAR, Coll. Antropol., 23 (1999) 707. — 2. DEŽMAN, B.: Determining homogenous groups of young basketball players on the basis of some anthropometric and motor dimensions. Ph.D. Thesis. In Slovenian. (Fakulteta za telesno kulturo, Ljubljana, 1988). — 3. DEŽMAN, B., B. LESKOŠEK, Računalniško podprt informacijski sistem za ugotavljanje in spremljanje telesnega, motoričnega in igralnega razvoja mladih košarkarjev in košarkaric. In: Zbornik referatov. In Slovenian. (1. Mednarodni simpozij "Šport mladih", Bled, 1990). — 4. DEŽMAN, B., Expertensystem – Model zur Erfolgsprognose der Spieler im Basketball. In: Proceedings. (6th ICHPER-Europe Congress, Prague, 1992). — 5. LESKOŠEK, B.: Comparative analysis of expert methods from the viewpoint of their usefulness for the initial selection and orientation of children into different sports. Ph.D. Thesis. In Slovenian. (Fakulteta za šport, Ljubljana, 1996). — 6. DEŽMAN, B., Kineziologija, 28 (1996) 37. — 7. SEMAŠKO, N. V.: Basketball. (Fizkultura i sport, Moskva, 1976). — 8. WOOTEN, M.: Coaching basketball successfully. (Leisure Press, Illinois, 1992). — 9. SWALGIN, K., Kinesiology, 30 (1998) 31. — 10. TRNINIĆ, S.: Analiza i učenje košarkaške igre. In Croat. (Vikta, Pula, 1996). — 11. JOŠT, B., B. DEŽMAN, J. PUSTOVRH: Evaluating successfulness models in certain sports on the basis of expert modelling. In Slovenian. (Fakulteta za šport, Ljubljana, 1992). — 12. DEŽMAN, B., F. ERČULJ, Die Anwendbarkeit des Expertensystem-modells zur Erfolgsprognose junger basketballspieler. In: Proceedings. (International Conference on Science in Sports Team Games, Sports Kinetics, Biala Podlaska, Poland, 1995). — 13. ERČULJ, F.: Morphological-motor potential and performance of young basketball players on the Slovenian national team. Ph.D. Thesis. In Slovenian. (Fakulteta za šport, Ljubljana, 1998). — 14. KURENT, D.: Congruency of different modes of assessing playing efficiency in basketball. Graduation Thesis. In Slovenian. (Fakulteta za šport, Ljubljana, 1998). — 15. DIZDAR, D., S. TRNINIĆ, D. MILANOVIĆ, Kinesiology, 29 (1997) 49. — 16. TRNINIĆ, S., D. DIZDAR, Ž. JAKLINOVIĆ-FRESSL, Kinesiology, 31 (1999) 29. — 17. TRNINIĆ, S., D. DIZDAR, Coll. Antropol., 24 (2000) 217. — 18. TRNINIĆ, S., D. DIZDAR, B. DEŽMAN, Coll. Antropol., 24 (2000) 443.

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EKSPERTNI MODEL SUSTAVA ODLUČIVANJA ZA UČINKOVITO USMJERAVANJE KOŠARKAŠA NA POJEDINE POZICIJE I ULOGE U IGRI – EMPIRIJSKA PROVJERA

SAŽETAK

Cilj istraživanja bio je empirijski provjeriti ekspertni model za učinkovitije usmjerenje košarkaša na pojedine pozicije i/ili uloge u igri. Uzorak ispitanika činilo je 60 slučajno odabranih košarkaša (12 za svaku poziciju u igri) iz 12 klubova prve hrvatske košarkaške lige u sezoni 1998/99. Podaci su prikupljeni od 10 košarkaških trenera, koji su procjenjivali ukupnu uspješnost (stvarnu kvalitetu) košarkaša u u fazi obrane (7 varijabli) i napada (12 varijabli). Sustav su utemeljili Trninić, Perica i Dizdar (1999.). Pored navedenih varijabli u istraživanje je bila uključena i varijabla: tjelesna visina. Na osnovi dobivenih rezultata ustanovljeno je kako se upotrijebljeni sustav odlučivanja može koristiti kao pomoćno sredstvo pri usmjeravanju igrača na odgovarajuće igračke pozicije i uloge u igri. Utvrdilo se nadalje da su igrači dobili najveće ocjene cjelokupne igračke uspješnosti upravo za poziciju na kojoj primarno igraju. Najveće razlike prisutne su između igrača koji igraju primarno na pozicijama 1 (bek) i 5 (centar). Najteže je procijeniti najoptimalnije pozicije za igrače koji primarno igraju na poziciji 3 (krilo), a zatim na pozicijama 2 (bek šuter) i 4 (krilni centar). Igrači na tim pozicijama su naj-

svestraniji igrači, pa je i odabir pozicije ovim sustavom za takav profil igrača najnepouzdaniji. Povoljna tjelesna visina tih igrača znatno doprinosi njihovoj sposobnosti da igraju na više igračkih pozicija i obavljaju više uloga u igri. U ovom istraživanju potkrijepljena je teza da je tjelesna visina čimbenik koji najviše utječe na usmjeravanje igrača na njima odgovarajuće pozicije i uloge u igri.