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Original research article

THE INFLUENCE OF SELECTED COGNITIVE ABILITIES ON THE EFFICIENCY OF BASKETBALL PLAYERS

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Abstract. *The aim of this study was to examine the influence of certain cognitive abilities on the shooting efficiency and overall efficiency of professional basketball players. The research was conducted on 48 professional basketball players who played in the last season of the Serbia and Montenegro league. The minimal conditions the players had to fulfill in order to be included in the research were the following: that they participated in at least 12 games (of 22), spent at least five minutes on the court per game, and that they had at least two field shots and two free throws per game. Independent variables were acquired by using five tests of cognitive abilities (the Domino test D-48, P1, S1, F1 and F2), and the dependent variables were the data on the situation efficiency of basketball players when shooting (efficiency of field shots, free throw efficiency, average points per game and index of efficiency). A poor/moderate correlation between three independent variables: general intelligence, perceptive identification and perceptive analysis and logical conclusions and the dependent variable index of efficiency was determined. The regression analysis by using a stepwise algorithm of variable selection obtained a significant influence of only one independent variable - perceptive analysis and logical conclusions on only one dependent variable index of efficiency. In basketball practice it is necessary to create training so as to provide encouragement for the development and improvement of basketball players' cognitive abilities to increase their overall performance.*

Key words: *Perception, Spatialization, Shooting, Free throw, Index of efficiency.*

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INTRODUCTION

Winning in a basketball game is an essential and explicit sign of success in basketball. This is why competitive results in basketball (and other team sports) are sometimes taken as the criterion to evaluate the quality of an individual – basketball player (Salgado, Sedano, de Benito, Izquierdo & Cuadrado, 2009; Rodríguez-Alonso, Fernández-García, Pérez-Landaluce & Terrados, 2003; Beker, 1981). However, basketball is a collective, polistructural as well as complex game, so the competitive result always represents the success of the team, i.e. a job well done by all five players working together as a team on the court (Trninić, Karalejić, Jakovljević & Jelaska, 2010a; 2010b). Basketball is also a somewhat strange game in which five of the best individuals frequently cannot guarantee success. Players of the winning team are not necessarily the best players in their respective positions. Studies in which the individual quality of basketball players is used as a criterion, evaluate the quality of players usually based on parameters of situation efficiency (game statistics) or based on expert analysis (Trninić, Perica & Dizdar, 1999; Trninić, Dizdar & Dežman, 2002). The performance statistics includes recording the following activities of the players on the court: shooting, assistances, rebounds etc. Out of these data, the so called index of successfulness is calculated for each individual (MVP - most valuable player). Certain coaches, sports and statistical experts have created various ways of collecting data and calculating the index of successfulness (Swalgin, 1994; Telmes, 2003; Trninić et al. 1999). The evaluation of experts is a reliable way to evaluate the quality of players if the necessary procedure is conducted correctly (Jakovljević, 1996; 2003; Karalejić, 1996; Karalejić & Jakovljević 2008b; Trninić et al. 2002). When comparing these two ways of evaluating players, some researchers have achieved a strong connection (Swalgin, 1993; Jakovljević, Karalejić & Radovanović, 2007), and certain authors have combined them (Trninić et al. 2002).

In basketball, winning means achieving more score shots than the other team. To the means of achieving a score shot in basketball is shooting at the basket. The main characteristic of a shot is its precision, i.e. its efficiency in a game. The precision of a shot basically depends on the following: the proper technique (mechanics) of shooting, the constitution of the players, their physical abilities, psychological characteristics as well as shooting tactics (Karalejić & Jakovljević, 2008a). Basketball shots are performed from various distances and under various circumstances concerning the defense of the opposite team. A crucial segment of shooting in basketball are also free throws. Unlike shooting from the field, free throws always occur in the same, unchanged conditions (the same distance from the basket, time for performance, unhindered shooting, etc.). Generally speaking, players always strive perform a shot with kinematic parameters within the desirable range (Huston & Grau, 2003; Rojas, Cepero, Oná & Gutierrez, 2000; Schmidt, 2012), which should lead to high efficiency. The player who achieves a higher number of points is usually considered the best. Although it is clear that other basketball skills (both offensive and defensive) are important for achieving overall success in the game, shooting is the most important element in various methods of evaluating the situational efficiency of basketball players, i.e. the situational efficiency of shots is an essential part when calculating the index of successfulness in basketball players (Telmes, 2003).

On the other hand, psychological dimensions of basketball players are also considered a very important factor which influences the successfulness of players. This fact is best illustrated by the pyramid of success designed by John Wooden in which psychological

dimensions prevail (Wooden, 1998). In a large number of studies it was shown that certain psychological dimensions of players influenced their success (Brooks, Boleach & Mayhew, 1987; Brown & Burke, 2003; Hofman & Maresh, 2000; Karalejic, 1998; Maddi & Hess, 1992; Svoboda, 1993), cognitive abilities among them (Becker, 1981; Fiedler, McGuire & Richardson, 1989; Karalejić et al., 2008b; Jakovljević, 2003; Kioumourtzoglou, Derri, Tzetzis & Theodorakis, 1998; Sandeford & Shoenfelt, 2001; Zhnag & Li, 2000).

The aim of this study was to examine the influence of certain cognitive abilities on the situation efficiency of the shooting of basketball players on the overall efficiency of players in a game. It was assumed that players who were more successful on tests of cognitive abilities would be more efficient during the game.

METHOD

Participants

The research was carried out on a sample of professional basketball players who competed in the last season of the Serbia and Montenegro league. Out of the available 85 players, 48 were included in the research, based on the criteria concerning situational efficiency. Only the players who participated in at least 12 games (out of 22), spent at least five minutes on the court per game, and had at least two field shots and two free throws per game were included in the research.

Sample of variables and instruments

Five independent variables were obtained by five tests of cognitive abilities. The Domino test D-48, which was constructed by Anstey, adapted by Matić and Momirović (according to Perić, 1994) was applied to estimate the variable of *general intelligence* (*GI*). The variables *visual spatialization (VS)* and *perceptive differentiation and logical conclusions (PDLC)* were obtained on the basis of two tests from the SVPN-1 battery constructed by Reuchlin & Valin, adapted by Matić, Kovačevic and Wolf (according to Perić, 1994): S1, which evaluated spatial relations and P1, a test of geometric differences. Test F1, constructed by Bukvić (according to Perić, 1994) was applied to estimate the variable of *perceptive identification (PI)*, and the variable *perceptive analysis and logical conclusions (PALC)* was obtained on the basis of the results of the F2 test (test of square puzzles), constructed by Bukvić and Stajberger (according to Peric, 1994). These tests were often used on the Serbian sport population (Bačanac, 2001; Jakovljević, 1996; 2003a; 2003b; Karalejić et al., 2008).

Four dependent variables were obtained by the following four parameters of situation efficiency (the data were taken from official statistics done by the national basketball federation):

- *the efficiency of field shots* (*FS*) - the relation between all performed and scored shots,
- *free throw efficiency* (*FT*) - the relation between performed and scored free throws,
- *average points per game* (*APG*), and
- *the index of efficiency* (*IE*)

The index of efficiency (*IE*) was calculated using the formula:

$$IE = \frac{3 \cdot N3PTS + 2 \cdot N2PT + FT + AST + JMP + STB + FAULT + BL - (N3PTU + N2PTU + FTU + PFAU + TFU + TUO + BSO)}{N}$$

Where N3PTS is the number of 3 point scores, N2PT the number of 2 point scores, FT the number of free throws, AST the number of assistances, JMP the number of rebounds, STB the number of stills, FAULT the number of personal faults made by the opponent in contact with this player, BL the number of blocks, N3PTU the number of missed 3 point shots, N2PTU the number of missed 2 point shots, FTU the number of missed free throws, PFAU the number of personal faults, TFU the number of technical faults, TUO the number of turnovers, BSO the number of shots blocked by the opponent and N is the number of games.

Data analysis

First, descriptive statistics was calculated. The correlation coefficient among the independent and dependent variables was calculated. The impact of the independent on the dependent variables was examined by applying a multiple regression analysis by using a stepwise algorithm for variable selection. The statistical program SPSS 17 was used for data processing. The data was considered significant if $p<0.05$.

RESULTS

The descriptive parameters of all the variables are shown in Table 1. Table 2 shows the correlations among five independent and four dependent variables. The dependent variable *Index of efficiency* had a poor/moderate correlation with three independent variables: *general intelligence, perceptive identification* and *perceptive analysis and logical conclusions.* A poor correlation was found between the independent variable *visual spatialization* and the dependent variable *efficiency of field shots,* as well as between *perceptive analysis and logical conclusions* and *average points per game.*

Table 1 Descriptive statistics of all the variables

Variable	M	SD	Min	Max
GI (points)	32.06	5.90	9.00	41.00
PI (points)	24.10	5.31	13.00	33.00
PALC (points)	19.50	5.04	5.00	27.00
VS (points)	22.67	6.56	3.00	30.00
PDLC (points)	17.46	3.11	11.00	26.00
FS (%)	51.68	8.98	21.62	71.79
FT (%)	68.52	15.62	12.41	86.36
APG (points)	10.39	5.40	1.40	22.05
IE (points)	10.56	6.57	.86	25.18

Legend: GI - general intelligence, PI - perceptive identification, PALC - perceptive analysis and logical conclusions, VS - visual spatialization, PDLC - perceptive differentiation and logical conclusions, FS- efficiency of field shots, FT - free throw efficiency, APG - average points per game and IE - index of efficiency

Table 2 Correlation among independent and dependent variables

	FS	FT	APG	IE
GI	0.28	0.10	0.21	0.29*
PI	0.29	0.00	0.26	0.37**
PALC	0.17	0.01	0.32*	0.39**
VS	0.28*	-0.07	0.07	0.13
PDLC	-0.01	0.09	0.15	0.22

**p<0.01; *p<0.05

Legend: GI - general intelligence, PI - perceptive identification, PALC - perceptive analysis and logical conclusions, VS - visual spatialization, PDLC - perceptive differentiation and logical conclusions, FS- efficiency of field shots, FT - free throw efficiency, APG - average points per game and IE - index of efficiency.

The regression analysis by using a stepwise algorithm showed a significant influence of the independent variables only on one dependent variable: *index of efficiency* (R=0.39; R^2=0.15). This is why the results of the regression analysis presented in Table 3 are only for the dependent variable *index of efficiency*. In the first and only step the variable *perceptive analysis and logical conclusions* (PALC) was extracted.

Table 3 Regression analysis, Stepwise method: dependent variable – index of efficiency (IE)

Model Summary				ANOVA	
Model		R	R2	F	p
1		0.39	0.15	8.38	0.01
Coefficients					
Model		B	Std.Error	Beta	t	p
1 (Constant)	First step	0.58	3.56		0.16	0.871
	PALC	0.51	0.18	0.39	2.89	0.01

Legend: PALC - perceptive analysis and logical conclusions

DISCUSSION

The values of descriptive parameters of the independent variables are slightly higher than the values of the same parameters of other team-sport athletes (Bacanac, 2001). Basketball is a team sport with many intermittent dynamic and skilled movement activities. This means that basketball requires a combination of individual skills, team plays, tactics, and motivational aspects (Trninić & Dizdar, 2000). Mental skills play an important role in the development of basketball skills (Vernacchia, 1993; Sandeford et al., 2001), and are considered a part of fundamental basketball skills (Brown et al., 2003). A professional basketball player during his career, comes across many new atypical game situations and he must continually improve his technical-tactical and mental skills.

A poor/moderate correlation between three independent variables: *general intelligence*, *perceptive identification* and *perceptive analysis and logical conclusions* and the dependent variable *Index of efficiency* was expected. This is consistent with some previous studies done on this problem (Angyán, Téczely, Zalay & Karsai, 2003; Jakovljević, 1996; Millslagle, 2002; Zhnag et al., 2000). There was a poor correlation between the independent variable *visual spatialization* and the dependent variable *efficiency of field shots*. Field shots include every shot made during the game, from different positions and distances. Based on this, the

importance of spatial skills for efficiency of field shots was expected. Also, there was a poor correlation between the independent variable *perceptive analysis and logical conclusions* and the dependent variable *average points per game.* The average number of points per game is one of the most frequent criteria for the successfulness of a basketball player. The best scorer is usually the player who performs many shots and who takes every opportunity to carry out the shot. He must consider and analyze every offence situation well, and bring optimal decision accordingly.

In order to investigate the impact of independent variables on dependent variables the regression analysis, Step Wise method was used. A significant influence of independent variables was determined only for the dependent variable *index of efficiency*. The regression coefficients ($R=0.39$; $R^2=0.15$) showed a significant impact only for the variable *perceptive analysis and logical conclusions* on the dependent variable *index of efficiency*. The quality of basketball skills (specific technical elements and abilities in executing tactical tasks) mostly determines a basketball player's success and his contribution to team success. Those skills are determined by the development of relevant motor abilities, as well as cognitive abilities (Vernacchia, 1993; Jakovljević, 1996; Sandeford & Shoenfelt 2001). During a basketball game, perceptive analysis is essential. A player must identify the actual game-situation and decide, on the basis of his tactical and technical knowledge, on his course of motor action. Basketball contains a lot of new unexpected and atypical game-situations. In order to solve these situations a player needs to adapt quickly and apply new elements of tactical thinking. Generally speaking, all human skills include coordination of perception and action/ movement. Different types of skills place different emphases on the need for perceptual processes, cognitive decisions and motor control (Holding, 1989). Zhang and Li (2000) found that the agility in the operational speed of thought and perception are two extremely important factors in the development of basketball skills. Since the *index of efficiency* represents the general quality of a basketball player and is the product of almost all player actions in the game, the impact of the variable *perceptive analysis and logical conclusions* was expected. Similar results were obtained in other studies (Jakovljević, 1996; Millslagle, 2002; Zhnag et al., 2000).

One may wonder why we have not determined the impact of independent variables on shooting variables. Since shooting is a specific basketball skill, it requires a lot of practice and repetition until it becomes almost automatic. Usually when a player begins a shooting act, there is no time for change. He must either shoot or, very rarely, pass the ball - otherwise it would be a rule-violation. Some other factors are more important for shooting efficiency, like proper shot mechanics, good conditions of the player, emotional stability, etc (Karalejić et al., 2008a). Also, motor conversion can occur due to physical and psychological fatigue of a player and ruin proper shot mechanics (Karalejić et al., 2008b; Lyons, Al-Nakeeb & Nevill, A. 2006).

CONCLUSION

The results of the correlation analysis showed a poor/moderate correlation, primarily between three independent variables: *general intelligence, perceptive identification* and *perceptive analysis and logical conclusions* and the dependent variable *index of efficiency*. This was expected, and is consistent with some previous research of this problem (Angyán, Téczely, Zalay, & Karsai,. 2003; Jakovljević, 1996; Millslagle, 2002; Zhnag et al., 2000).

By using the regression analysis, only one independent variable - *perceptive analysis and logical conclusions* was determined to have an impact on only one dependent variable -

index of efficiency. During the game, a basketball player must first "scan" the court situation (*perceptive analysis*) and then, on the basis of *logical conclusion*, choose the optimal motor action, according to timing, place and means. No evidence of the impact of independent variables on shooting variables was determined. Shooting is obviously a primarily motor activity and its efficiency depends much more on other factors like: shot mechanics, the player's level of physical fitness, emotional stability, etc. (Karalejić et al., 2008a).

This study has certain limitations: firstly, a relatively small number of participants were included in the research. Secondly, in future, similar studies only focusing on cognitive skills should be carried out. Thirdly, it would be useful to increase the number of dependent variables, i.e. to include other basketball skills in the research.

REFERENCES

Angyán, L., Téczely, T., Zalay, Z., & Karsai, I. (2003). Relationship of anthropometrical, physiological and motor attributes to sport-specific skills. *Acta Physiologica Hungarica*, *90*(3), 225-231.

Bačanac, Lj. (2001). Karakteristike intelektualnih sposobnosti sportista sportskih igara [Characteristics of intellectual abilities of team sport athletes. In Serbian]. Unpublished master thesis. Beograd: FSFV.

Becker, M.B. (1981). *An Investigation into the Cognitive and Personality Dimensions of Basketball Athletes*. Unpublished doctoral dissertation. San Diego: School of Human Behavior, United States International University.

Brooks, M.A. Boleach, L.W., & Mayhew, J.L. (1987). Relationship of specific and nonspecific variables to successful basketball performance among high school players. *Perceptual and Motor Skills*, *64*(3), 823-827.

Brown, D., & Burke, K. (2003). *Fundamental skills of the complete basketball player.* In K. Burke, & D. Brown, Sport Psychology Library: Basketball. The Winning Edge Is Mental (pp. 9-35). Morgantown: Fitness Information Technology.

Fiedler, F.E., McGuire, M., & Richardson, M. (1989). The role of intelligence and experience in successful group performance. *Journal of Applied Sport Psychology*, *1*(2), 132-149.

Hofman, J.R., & Maresh, C.M. (2000). *Physiology of basketball*. In W.E. Garrett, & D.T. Kirkendall, Exercise and Sport Science. Philadelphia, PA: Lippincott Williams & Wilkins.

Holding, D.H. (1989). *Skills research*. In D.H. Holding, Human Skills. Chichester: John Wiley & Sons.

Huston, R.L., & Grau, C.A. (2003). Basketball shooting strategies – the free throw, direct shot and layup. *Sports Engineering*, (6), 49-64.

Jakovljević, S. (2003). Kognitivne sposobnosti najboljih mladih košarkaša Jugoslavije i komparativna analiza u odnosu na uzrast [Cognitive abilities of the best young basketball players of Yugoslavia and the comparative analysis in relation to age. In Serbian]. *Godišnjak* (11), 97-108.

Jakovljević, S. (1996). Simultaneous influence of the specific basketball motoric and cognitive abilities on success of basketball. *Facta Universitatis – Series Physical Education*, *1*(3), 91-98.

Jakovljević, S., Karalejić, M., & Radovanović, I. (2007). Relacije između dva načina ocenjivanja aktuelnog individualnog kvaliteta košarkaša kao kriterijuma njihove uspešnosti [The relations between two ways of evaluation of actual individual qualities of basketball players as a criterion of their successfulness. In Serbian]. *Fizička kultura, 61*(1-2), 25-33.

Karalejić, M. (1996): Konativne dimenzije ličnosti kvalitetnih košarkaša. [Conative dimensions of personality and quality of basketball players. In Serbian]. *Fizicka kultura*, *5*(3), 166-178.

Karalejić, M., & Jakovljević, S. (2008a). Teorija i metodika košarke. [Theory and methodic of basketball. In Serbian]. Beograd: Fakultet sporta i fizičkog vaspitanja.

Karalejić, M., & Jakovljević, S. (2008b). Kognitivne sposobnosti mladih košarkaša i njihova uspešnost [Cognitive abilities of young basketball players and their successfulness. In Serbian]. *Fizička kultura*, *62*(1-2), 109-116.

Kioumourtzoglou, E., Derri, V., Tzetzis, G., & Theodorakis, Y. (1998). Cognitive, perceptual and motor abilities in skilled basketball performance. *Perceptual and Motor Skills*, (86), 771-786.

Lyons, M., Al-Nakeeb, Y., & Nevill, A. (2006). The impact of moderate and high intensity total body fatigue on passing accuracy in expert and novice basketball players. *Journal of Sports Science and Medicine*, (5), 215-227.

Maddi, S.R., & Hess, M.J. (1992). Personality hardiness and success in basketball. *International Journal of Sport Psychology*, *23*(4), 360-368.

Perić, D. (1994). *Operacionalizacija 1* [Operationalizing 1. In Serbian]. Beograd: SIA.

Rodríguez-Alonso, M., Fernández-García, B., Pérez-Landaluce, J., & Terrados, N. (2003). Blood lactate and heart rate during national and international women's basketball. *The Journal of Sports Medicine and Physical Fitness*, 43(4), 432-436.

Rojas, F.J., Cepero, M., Onä, A., & Gutierrez, M. (2000). Kinematic adjustments in the basketball jump shot against an opponent. *Ergonomics*, *43*(10), 1651- 1660.

Salgado, I., Sedano, S., de Benito, A., Izquierdo, J.M., & Cuadrado, G. (2009). Perfil antropométrico de las jugadoras de baloncesto españolas. Análisis en función del nivel competitivo y de la posición específica de juego. *Revista Internacional de Ciencias del Deporte*, *15*(5), 1-16.

Sandeford, P., & Shoenfelt. E.L. (2001). *Mental skills for enhancing performance*. In P. Sandeford, Women's basketball: inside the practice court. Terre Haute: Ind. Wish Publishing.

Schmidt, A. (2012). Movement pattern recognition in basketball free-throw shooting. *Human Movement Science*, (31), 360-382.

Swalgin, K.L. (1994). *The Basketball Evaluation System: A Scientific Approach to Player Evaluation*. In J. Krause, Coaching Basketball (pp. 40-42). Indianapolis: Master press.

Swaglin, K.L. (1993). The Relationship of the Basketball Evalution System (BES) to Criterion Measures of Performance in Men's Division College Basketball. *Applied Research in Coaching and Athletics Annual*, March, 226-245.

Svoboda, B., (1993). Analysis of personality studies of top basketball players**.** *Acta Universitatis Carolinae: Kinanthropologica*, *29*(1), 57-61.

Telmes, D. (2003, April 26). Basketball Evaluation Formulas Historical Revision; The Basketball Statistics Analysis at the Web. Retrieved December, 24, 2003. from http:// www.eba-stats.com/form/table.

Trninić, S., Karalejić, M., Jakovljević, S., & Jelaska, I. (2010a). Structural Analysis of Knowledge Based on Principal Attributes of the Game of Basketball. *Physical culture*, *64*(1), 5-25.

Trninić, S., Karalejić, M., Jakovljević, S., & Jelaska, I. (2010b). Structural Analysis of Knowledge Based on Specific Attributes of the Game of Basketball. *Physical culture*, *64*(2), 22-41.

Trninic, S., Perica, A., & Dizdar, D. (1999). Set of Criteria for the Actual Quality Evaluation of the Elite Basketball Players. *Collegium Antropologicum*, *23*(2), 707-721.

Trninic, S., & Dizdar, D. (2000). System of the performance evaluation criteria weighted per positions in the basketball game. *Collegium Antropologicum*, *24*(1) 217-234.

Trninic, S., Dizdar, D., & Dezman, B. (2002). Pragmatic Validity of the Combined Model of Expert System for Assessment and Analysis of the Actual Quality Overall Structure of Basketball Players. *Colegium Antropologicum*, *26*(1) 199-210.

Vernacchia, R.A. (1993). The influence of a mental training technique upon the performance of selected intercollegiate basketball players. *ARCAA*, (1), 189-200.

Wooden, J.R. (1998). *Practical modern basketball* (3rd edition). San Francisco: Benjamin Cummings.

Zhnag, Y.K., & Li, X.J. (2000). Research on sports intelligence of basketball player. *Journal of Bejing teachers college of physical education*, *12*(4), 37-40;58.

UTICAJ POJEDINIH KOGNITIVNIH SPOSOBNOSTI NA SITUACIONU EFIKASNOST KOŠARKAŠA

Cilj ove studije je bio da se ispita uticaj pojedinh kognitivnih sposobnosti na efikasnost šutiranja i ukupnu efikasnost profesionalnih košarkaša. Istraživanje je sprovedeno na 48 profesionalnih košarkaša koji su igrali u poslednjoj sezoni lige Srbije i Crne Gore. Da bi igrači bili uključeni u istraživanje minimalni uslovi su bili: da su nastupili najmanje na 12 utakmica (od 22 utakmice), proveli u igri najmanje 5 minuta po utakmici, te imali najmanje po dva upućena šuta iz igre i dva slobodna bacanja po utakmici. Nezavisne varijable su dobijene primenom pet testova kognitivnih sposobnosti (Domino test D-48, P1, S1, F1 i F2), a zavisne varijable su predstavljali podaci o situacionoj efikasnosti košarkaša u šutiranju (efikasnost šuteva iz igre, efikasnost slobodnih bacanja, prosečno postignuti poeni po utakmici) i ukupna uspešnost (indeks uspešnosti). Pokazana je slaba do srednja korelacija između tri nezavisne varijable: opšta inteligencija, perceptivna identifikacija , te perceptivna anliza i logičko zaključivanje i zavisne varijable ukupna uspešnost. Rezultati regresione analize - Stepwise metod su pokazali značajan uticaj samo jedne nezavisne varijable - perceptivna anliza i logičko zaključivanje na samo jednu zavisnuu varijablu - ukupna uspešnost. U košarkaškoj praksi potrebno je kreirati treninge tako da omoguće podsticanje razvoja i usavršavanja kognitivnih sposobnooti košarkaša u cilju povećanja njihove ukupne uspešnosti.

Ključne reči: *percepcija, spacijalizacija, šutiranje, slobodna bacanja, indeks uspešnosti*