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## DISCLOSURE OF THE FACTOR STRUCTURE OF STUDENTS BASKETBALL TECHNICAL TRAINING

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### ABSTRACT

This report is provoked by the concrete work with students from Sofia University "St. Kliment Ohridski "in Physical Education and Sports. The study contingent is 147 students (men and women) who are future teachers of physical education and sports. The report is based on the results of sports-pedagogical testing conducted on terrain. To determine the factor structure of the students' technical preparation, an individual measurement of their basketball skills was made, which included: dribbling, catching and passing, three shooting tests - under the basket, on the move, from five positions and basketball defensive movement.

The purpose of the study is to reveal the factor structure of the individual's technical preparation in basketball for students-future sports-pedagogical specialists.

The following methods were used to achieve the goal: literature analysis, sports testing, pedagogical experiment. The results of the study are subjected to mathematical and statistical processing by factor analysis.

The analysis of the results shows that the factor structure of the future technical training in basketball of the future teachers of physical education and sports is determined by two main factors.

**Key words:** sport, future teachers, technical skills

### INTRODUCTION

The subject of physical education and sports is the development of physical abilities, technical qualities, and opportunities for improving health. Nowadays, when the problem of improvement of the educational process in physical education and sports is very topical, among the specialists it is increasingly necessary to consider that in order to increase the efficiency and attractiveness of the discipline, it is necessary to make significant changes in the educational process and it should acquire a training character (1).

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Technical training in sport does not exist in isolation; it is an integral segment of tactical, physical and psychological training. The combination of all the parts makes up a whole called sports training. At the same time, technical training is the basis on which other types of training are upgraded.

Technique as a major component of sports training is in dialectical unity with the tactics of sports games, which is why it is necessary to consider them theoretically from a comprehensive point of view. In practice, the individual technical elements and techniques appear as a means of tactics (2).

In support of the interconnectedness between the components of sports, training is the opinion of R. Kostadinov (2018), who summarizes that "technical and tactical skills are inseparable from

the level of motor skills. Synchronizing the physical and technical and tactical training of trainees is essential to achieving the desired result (3). Other experts in the field of physical education and sports who work on these problems with students from the Trakia University in Stara Zagora, (4, 5) join these conclusions.

The importance of technical preparation for ultimate sporting success is the opinion of G. Ignatov and V. Gavrailov, who say: "Improvement of technical skills in sport is one of the main goals of university football training (6).

The large number of interrelations between indicators of coordination abilities and technical capabilities in adolescent volleyball players established by P. Kolev (2017), as well as the conclusion made by him that the high level of mastering the volleyball technique is related to increasing the capabilities of the vestibular apparatus (7) reaffirms the need for the simultaneous and parallel development of all sports training countries.

Everyone working in the field of Physical Education and Sport is aware that it is a good idea for a sports group to be fit for people with equal physical and technical abilities (8).

Unfortunately, in the case of student education, this is in most cases unfeasible, making it difficult to teach the course material.

## METHODS

**The aim** is to reveal the factor structure of basketball technical skills.

**The object** of the study is the basketball preparation of the students.

**The subject** of study is the technical preparation of students, future controversial-pedagogical specialists.

**Methods:** literature analysis, pedagogical observation, factor analysis of six technical indicators for technical basketball skills.

**Respondents:** 147 students majoring in Physical Education and Sports at Sofia University "St. Kliment Ohridski".

## RESULTS

Factor analysis for data research has proven to be a widely used statistical approach in evaluating basketball preparation. It assesses sports training as a whole and in particular the individual parts of it. In our study, we evaluate the technical training of students who are future teachers of physical education and sports.

Detecting the factor structure of physical development, physical, technical and tactical preparedness, as well as specific performance or competitive efficiency is a multifaceted task with high information value for optimizing the training process (9).

Factor analysis is a statistical technique designed to convert multiple correlating data into a new set of non-correlating factors that explain as much of the total variance of the raw data as possible. This technique achieves the reduction of the number of initial variables by grouping those that correlate with others into a common factor and dividing the non-correlators into different factors (10).

Using the Scree Plot analysis made with the SPSS statistical program, visual confirmation was provided to identify the emerging factors in our study. As can be seen from the figure, the graph is broken by two factors and steep and becomes sloping.

On this basis, it was decided to group the studied signs into two factors. **Figure 1** provides visual confirmation of the two factors identified in our study. The graph is broken by two factors and steep and becomes sloping (11).

Based on the data obtained, a factor structure of the technical preparedness of the students studied was constructed without them being divided by gender.

The analysis shows that the factor structure of future basketball teachers' technical preparedness is determined by two main factors. The indicators - defensive movement, shooting on the move, shooting from five positions, catching and passing are grouped by the first factor, while the indicators of dribbling and shooting under the basket are grouped by the second factor (**Table 1**).

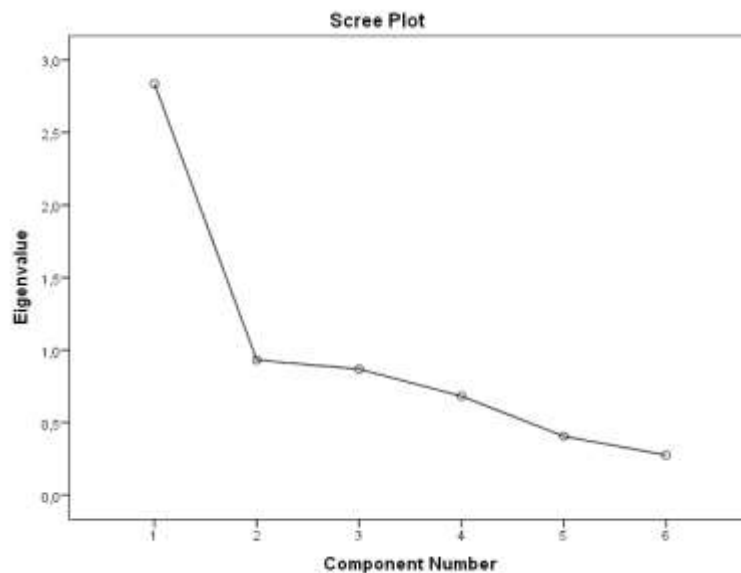


Figure 1. Score plot factor detection graph

Table 1. Distribution of indicators by factor weights

Factorial structure of basketball technical training				
Indicators	Factors		R <sup>2</sup>	1-R <sup>2</sup>
	1 <sup>st</sup> factor	2 <sup>nd</sup> factor	The community of each indicator	Uniqueness
Dribbling-index	0.064	<b>0.903</b>	0.819	0.181
Defensive movement	<b>-0.712</b>	-0.195	0.544	0.456
Shooting under the basket-index	0.344	<b>0.637</b>	0.525	0.475
Shooting on the move-index	<b>0.846</b>	0.116	0.73	0.27
Shooting from five positions	<b>0.727</b>	0.219	0.577	0.423
Catching and passing for 30 s	<b>0.741</b>	0.15	0.572	0.428
62.78%	40.40%	22.38%		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				

The factor structure of the technical six indicators in 147 student-future sports educators is made up of two main factors. The two factors explain 62.78% of the initial variance of the phenomenon studied. The relative shares of the source variance explained by each factor are: for the first factor - 40.40% and for the second factor 22.38% (Figure 2).

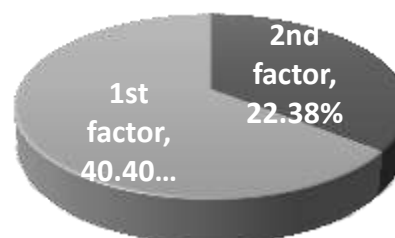
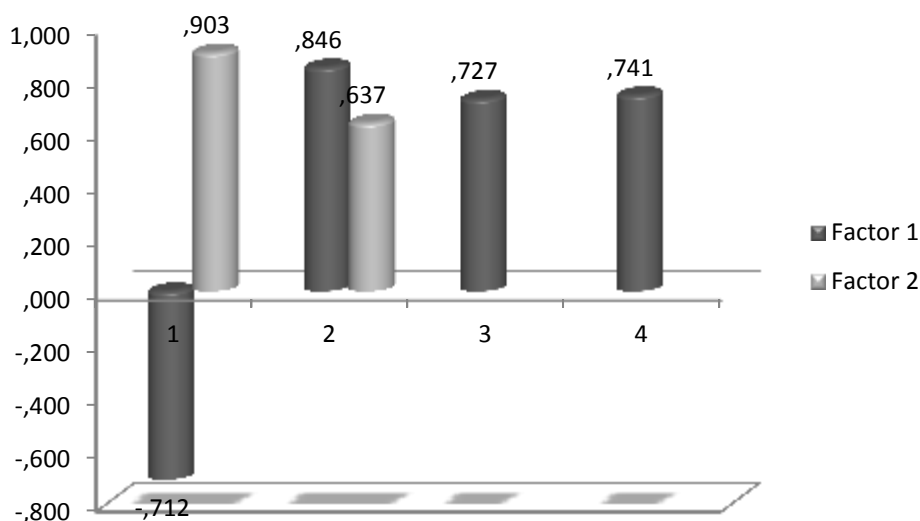


Figure 2. Relative proportions of the initial variance of the technical qualification of students in the specialty PES

The data analysis of **Figure 3** points us to the **first** and most important factor that explains 40.40% percent of the initial variance. The factor that determines the most important for the technical preparation for basketball of future teachers of physical education and sports is the "shooting on the move", where the factor weight is the highest (0.846). Shooting on the move is logically related to shooting from five positions, using the same technical skills, especially in the second attempt at shooting in a basket, the so-called second

shooting attempt. Technical preparedness is directly linked to offensive and defense. This is evidenced by the high factor weight of the element in defense - defensive movement (0.712) and other indicators - catching and passing (0.741) and shooting from 5 positions (0.727). For three indicators, the direction of increasing the results is positive and on this basis, it can be argued that the correlation between them is also positive. The defensive movement indicator has a negative direction where a reduction of the time is required.



**Figure 3.** Relative proportions of the initial variance of the technical qualification of students in the specialty PES

**The second factor** explains 22.38% of the initial variance. It is determined by two main indicators – leading the ball with the highest factor weight (0.903) and shooting under the basket with factor weight (0.637).

The factor can be identified as 'agility skills' where coordination, movement speed with a change of direction in a small space, combined with dribbling is required. The factor reveals the leading role of shooting under the basket and carries information about the speed-power capabilities of the upper and lower extremities of students. This serves as proof of the relationship between physical and technical qualities.

## CONCLUSION

The results of the factor analysis show that basketball's technical skills are based on two factors.

The first covers four indicators that show the relationship between the level of proficiency in offensive and defensive.

The second factor involves two indicators that show the relationship between technical ball skills and non-ball skills. Non-ball technical skills are related to students' specific physical qualities.

The data make it possible to summarize, on the one hand, that technical skills are interconnected and, on the other, that they are based on the current state of physical qualities.

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