THE EFFICIENCY OF THREE DIFFERENT LEARNING METHODS IN TEACHING BASKETBALL TWO-STEP

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Abstract: Learning methods and improving the technique performance are an unavoidable phenomenon in the Physical Education (PE). Together with teaching methods and practice methods, they are one of the basic conditions for successful work. Performing a basketball two-step, as one of the elements of the basketball game in primary education, represents a complex motor movement for pupils. So, the aim of the research was to determine which type of learning method during teaching basketball two-step in the field of PE is most effective for primary education pupils. The tested methods were the analytical, synthetic and combined learning methods. The survey was conducted in three fourth grades classes (43 pupils in total). Each class underwent pre-assigned basketball two-step training and thus one fourth grade class worked by synthetic, second by analytical and third by combined learning method.
Descriptive statistics indicate that the best results were obtained by the combined method of basketball two-step, while the analytical learning method is second. The synthetic method of teaching basketball two-step in primary education proved irrelevant, as it produced the worst result.
The results of the One-Way ANOVA statistical analysis show that the difference of the three average scores obtained from the three different learning methods in teaching basketball two-step is statistically significant.
LSD post hoc test showed that statistically significant difference exists between the synthetic and the combined learning methods. A comparison of the synthetic and analytical learning method did not indicate a statistically significant difference, nor did the comparison between the analytical and the combined learning method.
In conclusion, the research results show that the combined learning method is suitable for learning the basketball two-step in primary education students. This can be attributed to the fact that the combined method of learning contains both an analytical and a synthetic learning method. If the motor task is not understood at first, students perform the movement analytically and then they can perform it synthetically, in its entirety.
Keywords: analytical learning method, combined learning method, synthetic learning method, primary education

1. INTRODUCTION

The actual and perspective effects of PE depend largely on the chosen methods and procedures (Warchol, 2016). Learning of skills is a teaching strategy that accepts the assumption that almost every pupil can learn for what is taught in given sufficient time and assistance (Blakemore et al., 1992). Learning methods and refining the technique are a necessary occurrence in PE class. These, together with teaching and training methods, are one of the basic conditions for successful work. Teaching methods are not only used in the learning process, that is, in the stage of mastering a particular motor task, but also in the stage of perfecting it (Findak, 1992). These methods are applied in the realization of organizational forms of work, in all forms of exercise, and which method will be preferred depends on the specific situation. All of the above should respect the age of the pupils, the complexity of motor movement, the motor experience of pupils, their abilities, material working conditions (Findak, 2003). The basic methods of learning and improving the technique, in terms of motor awareness (acquisition of motor skills and motor habits), are: analytical method, synthetic method, combined method, situational method, complex method and related influence method (Findak 2003; Mršić, Jerković 2010).
The analytical method of learning consists of learning movement by parts. Movement is fragmented into individual parts, then each part is individually learned and when certain parts of the movement are adopted, it goes on to link these individual movements into a whole (Findak, 1992). Synthetic method of learning is the most appropriate method of learning for primary education pupils due to the complexity of the program content. It is considered as the most natural method of learning because the movement is taught as a whole, as seen and applied. This method of learning enables the individuality of the student to emerge, which is interpret as her great advantage (Findak, 1992). The combined learning method is considered appropriate for the school population and the realization of program contents (Delija, 2003). The combined learning method is a combined application of the synthetic and analytical

method. During particular movement learning, the synthetic method is first applied, while in the course of the work, if necessary, a certain part of the movement is subsequently performed by the analytical method, and immediately after the difficulties have been overcome, the movement is repeatedly performed as a whole, synthetically. The combined method of learning is therefore an alternating synthetic-analytical-synthetic method, so it can be concluded that the synthetic method is the one that prevails while the analytical method complements it (Findak, 2003). Each movement and motor task prescribed by the Physical and Health Education Curriculum is a segment that requires work by a particular method of learning, given the degree of complexity of the movement and task itself. The performance of basketball two-step, as one of the elements of basketball play in primary education, is a complex motor movement for pupils. Therefore, the aim of the research was to determine which method of teaching basketball two-step in the field of PE is most effective for primary education pupils.

2. METHODS

The sample of respondents consisted of three classes (43 pupils in total) from one elementary school in Zagreb, Croatia. Participants were fourth-grade primary education pupils who were nine to ten years old. For the purposes of this research, each of the fourth graders worked on a particular method of learning basketball in the PE classes. So, 4th „a" grade worked with the synthetic method of basketball two-step (Method 1), 4th „b" grade worked with the analytical method of basketball two-step (Method 2), while 4th „c" worked with the combined method of basketball two-step (Method 3). Each class underwent a 5-hour basketball training session before evaluating the basketball two-step, which was for the purpose of collecting statistics. For ease of review and depending on the number of students in the class, students were divided into groups, thus practicing the element of basketball. For the 98% of students who participated in the survey, the dominant hand was the right hand while performing the basketball two-step, while for only 2% of the students left hand was the dominant hand when performing the basketball two-step. Appropriate exercise for learning basketball two-step were also conducted with the pupils in each of the fourth grades, in the following order: jump into the hoops, performing basketball two-step from a place, performing basketball two-step from movement. The exercise was very successfully mastered, with the necessary constant corrections during the performance. The most commonly assumed errors in performance: take-off with the wrong foot, the number of steps allowed, and the performance of the last step in the distance, but not upward, proved to be relevant in this study and were subject to performance correction. The performance of basketball two-step was ultimately graded from a school grade of 1 to 5. Prior to the two-step rating, each class was repeatedly shown the teaching method they were working on. Then they started with a two-step performance. Each student was allowed to perform a two-step three times. The best rating of these three performances was taken into account.

3. DATA PROCESSING METHODS

The study of the effectiveness of three different two-step learning methods included 43 students in three fourth-graders (N = 43). In each class, a different teaching method was applied, and their effect was always measured by three assessors with a school grade of 1 to 5. Statistica 13 was used to calculate the minimum and maximum values of individual variables, arithmetic mean and standard deviation, and ANOVA (analysis of variance) with *LSD post hoc test*.

4. RESULTS

Based on the grades of the three assessors, an average grade was calculated for each student. Subsequently, a descriptive analysis was performed based on the average grades obtained for each student, the results of which are summarized in the following table.

Table 1: Results of descriptive statistical analysis of students' grades for learning basketball two-step - by individual learning methods (N = 43)

Method	Grade	N	AG	SD	Cv	Amin	Amax
1	4a	20	3,62	0,33	9	3,00	4,00
2	4b	11	4,00	0,88	22	2,33	5,00
3	4c	12	4,11	0,56	14	3,33	5,00

Legend: N- number of pupils; AV- average grade; SD- standard deviation; Cv- coefficient of variation; Amin- minimum average; Amax- maximum average

Table 2: Results of analysis of variance

Source of variation	SS	df	MS	F	P
between groups	2,154	2	1,077	3,253	**0,049**
within groups	13,270	40	0,331		
In total	15,424	42			

Legenda- SS- sums of squares, df- degrees of freedom, MS- mean squares, F- value, p- coefficient of significance

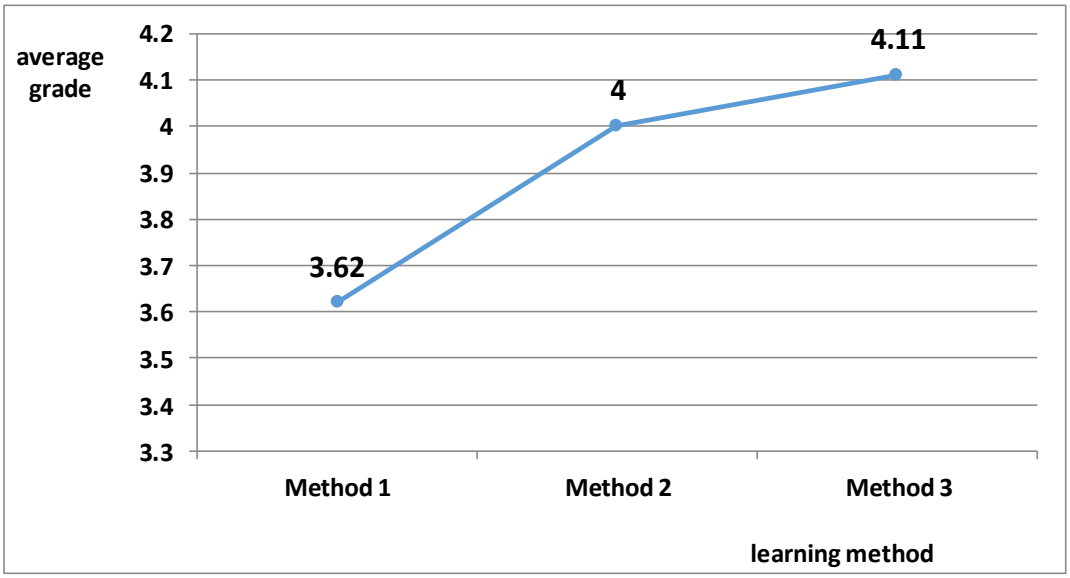
The obtained results (F = 3,253 p = 0.049) show that the difference is not random but statistically significant (p <0.05). It is evident from the arithmetic means given in the table 1 that the first method gave the lowest average (3.62), while the third method of learning gave the best average (4.11).

Table 3: Results of LSD post hoc test

Learning method	Learning method		
	1	2	3
1			
2	0,084		
3	**0,024**	0,646	

It can be established that there is a statistically significant difference between the first and third learning methods and that it is this difference (between 3.62 and 4.11) that leads to the conclusion stated above, namely that the three learning methods are statistically significantly different that is, the third learning method is most effective (Chart 1).

Chart 1: Demonstration of average efficiency of two-step learning methods (N = 43)



Based on the obtained results, it can be determined that the widely encouraged and for many movement structures in primary education, a suitable synthetic method of teaching basketball two-step does not find application in this sample of respondents. This can be attributed to the fact that the element of basketball two-step is complex in its structure, and the synthetic method is mainly applied to programs of simpler structure (Prskalo & Findak, 2003). On the other hand, the difference between the analytical and the combined learning method in regarding basketball two-

step training did not indicate statistical significance, but the difference between the synthetic and combined learning method indicated a statistically significant difference, and that this difference led to the conclusion that the three learning methods during basketball two-step were statistically significantly different ($p < 0.05$).

The combined learning method of basketball two-step, based on the results obtained in this research, proved to be the most suitable for primary education students, which is attributed to its synthetic-analytical activity, ie the fact that the movement is presented first as a whole and then fragmented if the need arises for showing each individual segment of motion. It should dominate in the work with preschool and school children, especially if the synthetic method cannot be used in the implementation of program content (Delija, 2003). This research may serve as a motivation for carrying out further research on this topic, but the results of this research should by no means be taken as generally valid for teaching basketball two-step in primary education.

On the other hand, the aim of Knjaz's (2005) research was to determine the effectiveness of learning methods - analytical, synthetic and situational, in teaching a basketball game on a sample of 90 boys aged 9 and 10 years. The study carried out a six-month work program that differed only in the learning methods between the selected subgroups. The author points out that significant positive changes have taken place over the life of the program, regardless of the learning method in most tests for assessing motor skills and in all tests for assessing specific motor skills. The greatest advances in the elements of the basketball game and technique were seen in the results of the group trained by the synthetic method of learning. On the other hand, the analytical method proved to be most applicable in adopting the more complex elements of basic basketball technique, while the positive effects of the situational learning method were the least pronounced. The author concludes that the synthetic method of learning is the most applicable for the population of basketball children beginners, while the analytical method of learning is suitable for the adoption of structurally more complex elements.

Tomljenović, Vujnović and Serdar (2003), on a sample of 92 (36 male and 56 female) fourth-graders, examined which method of teaching, synthetic or analytical, made pupils more likely to adopt a more difficult unit prescribed by the fourth-grade curriculum. The variable used in this study is the rolling and reel teaching unit, while the name of the teaching topic is the reel forwards and backwards. In this study, two classes worked by the analytical method of learning, and two classes by the synthetic method of learning. Three evaluations were made: initial, control and final. Based on the results obtained, the authors concluded that the classes that used the analytical and teaching methods in the control and final grades quickly adopted the new teaching topic. The students achieved a better level of knowledge by the analytical method of learning because they performed the reel forward better and kept an eye on the starting position, the exercise only, the reel start position, and the exercise completion and completion. The classes that worked with the synthetic method of teaching performed the teaching topic quickly, without emphasizing the individual elements of the exercise, and with a tendency to repeat the same mistake during the performance.

5. CONCLUSION

On the basis of the obtained results, it can be concluded that the combined method, unlike the synthetic and analytical method, obtained better results and thus proved to be a relevant method of learning basketball two-step in primary education. It has become clear that the synthetic method of learning does not find application in basketball two-step learning, and this is attributed to the complex structure of its performance, therefore, a combined method of learning is appropriate for two-step learning. On the other hand, the difference between the average grade of the analytical and the combined learning method did not indicate statistical significance, which tells us that the analytical method may be suitable for mastering a basketball two-step. The above statement is logical, because the two-step structure is complex and subject to the analysis of individual parts (phases) of motion, for which the use of the analytical learning method is appropriate.

In theory, it is evident that the synthetic method of learning is not suitable for mastering complex motor tasks, as was shown in this research. The theory dictates that complex motions are subject to analysis by the method of analysis, because complex motions are fragmented into parts and thus gain insight into each particular segment of motion. On the other hand, the combined method of learning is also well suited for the interpretation of complex motions, and this is attributed to its synthetic-analytical effect.

Given the small number of studies of basketball in primary education, it is advisable, if there is interest, to research on this topic, because basketball is one of the components prescribed in the Primary Education Curriculum. This work is based on research conducted may serve as motivation for future knowledge in primary education from the aspect of basketball games.

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