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The Value of Different Motor Teaching Methods in Working with Basketball Beginners

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Abstract

The aim of this study was to identify the efficacy of three different teaching methods existing in contemporary sport: the analytical, synthetic and situational methods. The sample of subjects comprised 90 boys, 9 – 10 years of age, who were beginners in basketball. A six-month program was implemented that, regarding the groups analyzed, varied only according to the selection of the motor teaching methods. The assessment of the effects of certain methods was carried out through the analysis of the development of the basic elements of basketball technique. The effects of the program were analyzed using the variance analysis. The kinesiological influence that the subjects were exposed to led to significant changes, regardless of the teaching method, in most of the applied tests for the assessment of the basic motor abilities and the specific motor skills. The biggest effects were initiated by the synthetic teaching method; the analytical method proved to be the most successful one in the most demanding elements, whereas the positive effects of the situational teaching method were manifested the least.

Key words*: basketball; children; teaching methods.*

Introduction

Basketball technique is the basic means through which the basic goal of the game itself is achieved, the basic goal being winning the game. Basketball technique consists of movement patterns which are performed both by players with or players without the ball, in accordance with the rules of the game. This technique represents rational, economical, rhythmical and above all effective movements which enable players to tackle various situations during the game. In this manner, the elements of basketball technique allow for strategic ideas to be put into practice on the court, or, in other words, realized. A high level of acquisition of the specific motor skills enables a more effective

realization of the tactical ideas and by this it most probably leads to success in the game. This also leads to the conclusion that success in the game is highly determined by the knowledge of the elements of basketball technique – the specific motor skills necessary to play basketball. Basketball technique is exceptionally extensive and it encompasses programs for motor learning which deal with the realization of specific basketball movement patterns. In order to acquire certain specific basketball movement patterns, it is necessary to actively participate in a long-lasting process of learning and training, or, in other words, basketball training. As a result of basketball training a basketball player acquires a certain level of development in his/her abilities and knowledge so that he/she can functionally control his/her movements during the performance of dynamic stereotypes which are required in basketball (Matković, 2010).

The previously conducted research (Krause, Meyer & Meyer, 2008) has shown that the basic technique should be acquired as early as possible, at the age of nine or ten. However, in mini basketball programs children start learning basketball technique even earlier, in the period between the ages of seven and nine (Knjaz, 2000); that is, as soon as beginners join the process of systematic learning and basketball training. The elements of basketball technique which have been incorrectly learned and automatized are very difficult to correct, so the task of sports training and its program is to form perfect stereotypes from the very beginning in order for the technique to become a stable and automatized motor pattern of quality (Memmert, 2006).

In the teaching methods applied in all sports, including basketball, there are three basic methods (Appelton, 1969; Oreb, 1984; Singer, 1990; Silverman, 1994; Scmidt & Wrisberg, 2000; Coutinho & Santos Silva, 2009):

- analytical – a method in which the complete movement pattern is divided into a number of segments or phases which are then learned and acquired separately;
- synthetic – a method in which the motor task is acquired and perfected as a whole;
- situational – a method which is based on learning the elements of basketball technique in situational, real-life conditions which are typical of basketball.

The fundamental goal of this research is establishing the value of these three methods – analytical, synthetic and situational – in the course of learning and perfecting the basic elements of basketball technique.

Research Methods

The study sample was comprised of 90 boys aged nine and ten, who were basketball beginners and had not participated in any type of sports training program before joining this particular program. In addition, during this research, the boys did not take part in other sports training programs other than their regular physical training in their respective elementary schools. In order to attempt to preliminary form comparable subgroups of the subjects, the children were divided into groups of basketball beginners with regard to their anthropometric features and motor skills, by conducting a preliminary testing. This testing included measuring their height and body mass, as

well as tests for the evaluation of their basic motor skills (the polygon backwards, the 20-meter run test, the standing long jump). An attempt was also made to evaluate performances of the individual elements of basketball technique. It was observed that children of that age who were basketball beginners did not have a clear idea of the manner in which the assigned elements should be performed, and that they were not able to demonstrate these elements even in their roughest form. On account of this, the testing of this segment was dismissed, as had, in fact, been predicted. Based on the preliminary test results, subgroups were formed so that children with roughly identical results were divided into various subgroups. In this manner the study sample was separated into three equal groups without any statistically significant difference in their morphological characteristics or basic motor abilities. During the process of training each of these groups was instructed in the basketball elements using different methods (synthetic, analytical or situational), while all the other training elements were identical. Within the framework of the program which lasted six months, every week there were three training sessions in duration of 60 minutes. The entire program was conducted by two coaches, both with degrees in kinesiology and a specialization in basketball, who went through additional education, precisely for the purpose of this research.

The specific motor skills in the basketball domain were evaluated among the subjects based on the assessments of five educated, trained and independent experts who had had at least three years of experience in working with children in mini basketball programs or basketball schools (Knjaz, 2000; Zhang, 2001). The assessment was conducted for the first time three months after the beginning of the program, and the second time at the end of the program, forming a transition and the final measurement. The grades ranged on a scale between zero and five.

Basketball experts evaluated the following elements:

1. static dribbling with the right hand
2. static dribbling with the left hand
3. speed dribbling with the right hand
4. speed dribbling with the left hand
5. basic layup, after dribbling, with the right hand
6. basic layup, after dribbling, with the left hand
7. basic layup, after catching a pass, with the right hand
8. basic layup, after catching a pass, with the left hand
9. three passing techniques[1] (the chest pass, the one hand push pass, the overhead pass with two hands)
10. passing and catching the ball while in movement
11. stopping
12. shot from the mid-range (4m).

[1] The final grade of this particular element was calculated as the arithmetic mean of the three grades for the above mentioned passing techniques.

Within the framework of descriptive statistics, the measured values of the variables were analyzed using the standard methods in order to determine their basic statistical characteristics. The arithmetic mean was calculated for all of them, as well as standard deviations and standard errors. Also, for each variable both the maximum and the minimum values were determined. The Kolmogrov-Smirnov test was applied to test the normality hypothesis for the normal distribution of each individual variable.

With regard to the established problem and the quasi-experimental research design which was conducted, the most suitable statistical analysis for the results which had been gathered was variance analysis, or, more specifically, multidirectional variance analysis, which provides statistical data based on which a more thorough and explicit conclusion can be drawn on the relative efficiency of individual treatments in basketball. Data processing was performed on a significance level (p) - .05. The data was processed using the SPSS program for Windows.

Results

The obtained results are presented in the following tables. Descriptive parameters of all the variables within the domain of the specific motor skills after three months of training for all three subgroups are presented in Table 1, while the results obtained after six months of training are presented in Table 2. The distribution of results in almost all tests does not significantly differ from the normal, according to the Kolmogorov-Smirnov test.

The evaluation of efficiency while performing the elements of basketball technique was determined by basketball experts based on the criteria that had been agreed on beforehand, using the grades ranging between zero and five. Expert evaluations are frequently present in kinesiological research as the means of determining efficiency in various sports activities and some research has been published in which evaluations of efficiency in basketball were based on the judge's assessments (Blašković et al., 1983, Matković, 1992).

The average results of different tests in both measurements vary, as was expected, since the elements differ according to their structure and the complexity of performing and acquiring, as well as according to their order of acquisition. In the second, final measurement the grades were significantly higher than after three months of basketball training.

Table 1. *Descriptive statistical parameters for the assessment of the specific motor skills for all three groups of subjects (transition measurement)*

		Mean	SD	Minimum	Maximum
Static dribbling with the right hand	analytical	2.17	1.09	1.00	5.00
	synthetic	2.56	1.07	.00	4.00
	situational	2.42	.96	1.00	4.00
	all groups	2.38	1.04	.00	5.00
Static dribbling with the left hand	analytical	2.04	.95	.00	5.00
	synthetic	2.38	.89	1.00	4.00
	situational	2.00	.78	1.00	4.00
	all groups	2.14	.88	.00	5.00
Speed dribbling with the right hand	analytical	2.00	1.12	.00	4.00
	synthetic	2.56	1.06	1.00	5.00
	situational	2.25	.98	1.00	5.00
	all groups	2.27	1.07	.00	5.00
Speed dribbling with the left hand	analytical	1.85	1.21	.00	4.00
	synthetic	2.20	1.00	.00	4.00
	situational	1.96	.94	1.00	5.00
	all groups	2.00	1.05	.00	5.00
Basic layup with the right hand	analytical	2.78	1.16	1.00	5.00
	synthetic	2.23	1.09	.00	4.00
	situational	2.34	1.41	.00	5.00
	all groups	2.46	1.23	.00	5.00
Basic layup with the left hand	analytical	1.60	1.27	.00	4.00
	synthetic	1.29	1.11	.00	4.00
	situational	1.15	1.09	.00	3.00
	all groups	1.34	1.16	.00	4.00
Basic layup after catching a pass with the right hand	analytical	1.30	.82	.00	3.00
	synthetic	1.23	1.10	.00	4.00
	situational	1.06	.98	.00	3.00
	all groups	1.19	.97	.00	4.00
Basic layup after catching a pass with the left hand	analytical	.75	1.07	.00	3.00
	synthetic	.86	.90	.00	3.00
	situational	.58	.81	.00	3.00
	all groups	.73	.93	.00	3.00
Passing and catching the ball in a static position	analytical	2.13	.95	1.00	4.00
	synthetic	2.06	.81	1.00	4.00
	situational	2.31	.97	1.00	4.00
	all groups	2.17	.91	1.00	4.00
Passing and catching the ball while in movement	analytical	1.37	1.11	.00	4.00
	synthetic	1.72	.90	.00	4.00
	situational	1.54	1.03	.00	4.00
	all groups	1.54	1.02	.00	4.00
Stopping	analytical	1.54	1.03	.00	4.00
	synthetic	1.78	1.02	.00	4.00
	situational	1.87	1.11	.00	4.00
	all groups	1.73	1.05	.00	4.00
Shot from the mid-range (4m)	analytical	2.06	.96	.00	4.00
	synthetic	2.56	1.00	.00	4.00
	situational	2.15	1.13	.00	4.00
	all groups	2.25	1.04	.00	4.00

Table 2. *Descriptive statistical parameters for tests evaluating motor skills for all three groups of subjects (final measurement)*

		Mean	SD	Minimum	Maximum
Static dribbling with the right hand	analytical	3.51	1.06	1.00	5.00
	synthetic	3.88	.88	2.00	5.00
	situational	3.27	.99	1.00	5.00
	all groups	3.55	1.00	1.00	5.00
Static dribbling with the left hand	analytical	3.12	1.28	1.00	5.00
	synthetic	3.52	.77	2.00	5.00
	situational	2.83	1.12	1.00	5.00
	all groups	3.15	1.11	1.00	5.00
Speed dribbling with the right hand	analytical	2.67	1.04	1.00	5.00
	synthetic	3.48	.97	2.00	5.00
	situational	2.73	.96	1.00	4.00
	all groups	2.95	1.05	1.00	5.00
Speed dribbling with the left hand	analytical	2.52	1.14	.00	5.00
	synthetic	3.13	.88	1.00	5.00
	situational	2.35	.94	1.00	4.00
	all groups	2.66	1.04	.00	5.00
Basic layup with the right hand	analytical	3.82	.97	2.00	5.00
	synthetic	3.19	1.15	1.00	5.00
	situational	2.67	1.35	.00	5.00
	all groups	3.22	1.24	.00	5.00
Basic layup with the left hand	analytical	2.74	1.33	1.00	5.0
	synthetic	2.12	1.38	.00	5.00
	situational	1.88	1.34	.00	5.00
	all groups	2.24	1.38	.00	5.00
Basic layup, after catching a pass, with the right hand	analytical	2.50	1.17	1.00	5.00
	synthetic	2.12	1.32	.00	5.00
	situational	1.62	1.05	.00	4.00
	all groups	2.07	1.23	.00	5.00
Basic layup, after catching a pass, with the left hand	analytical	1.84	1.26	.00	5.00
	synthetic	1.44	1.49	.00	5.00
	situational	1.10	1.01	.00	4.00
	all groups	1.45	1.29	.00	5.00
Passing and catching the ball in a static position	analytical	2.83	1.12	1.00	5.00
	synthetic	3.14	.90	1.00	5.00
	situational	2.71	.83	.00	4.00
	all groups	2.89	.96	.00	5.00
Passing and catching the ball while in movement	analytical	2.00	1.23	.00	4.00
	synthetic	2.56	1.00	1.00	5.00
	situational	1.81	.91	.00	4.00
	all groups	2.12	1.09	.00	5.00
Stopping	analytical	2.29	1.23	.00	5.00
	synthetic	2.80	1.15	1.00	5.00
	situational	2.31	.93	1.00	4.00
	all groups	2.47	1.12	.00	5.00
Shot from the mid-range (4m)	analytical	3.29	1.07	1.00	5.00
	synthetic	3.76	.78	2.00	5.00
	situational	2.98	1.08	1.00	5.00
	all groups	3.34	1.03	1.00	5.00

The results of testing the differences between the achievements of different teaching methods are presented in Tables 3 (transition measurement) and 4 (final measurement).

Table 3. *Test results on the significance of the differences between tests for evaluating the specific motor skills of the subgroup entities for the transition measurement (one-way analysis of variance)*

	F	p
Static dribbling with the right hand	.91	.406
Static dribbling with the left hand	1.44	.244
Speed dribbling with the right hand	1.79	.174
Speed dribbling with the left hand	.74	.479
Basic layup, after dribbling, with the right hand	1.29	.283
Basic layup, after dribbling, with the left hand	.99	.377
Basic layup, after catching a pass, with the right hand	.42	.658
Basic layup, after catching a pass, with the left hand	.60	.551
Passing and catching the ball in a static position	.49	.612
Passing and catching the ball while in movement	.77	.466
Stopping	.67	.514
Shot from the mid-range (4m)	1.68	.193

The results presented in Table 3 demonstrate that there are no statistically considerable differences between the subgroups, although a difference has been noticed between their arithmetic mean. The following tests demonstrated the largest differences in the arithmetic mean: speed dribbling with the left hand, the basic layup after dribbling with the right hand, and the basic layup after dribbling with the left hand.

Table 4. *A one-way analysis of variance of the tests for evaluating the specific motor skills (final measurement)*

	F	p
Static dribbling with the right hand	2.48	.090
Static dribbling with the left hand	2.54	.086
Speed dribbling with the right hand	5.22	.008
Speed dribbling with the left hand	4.37	.016
Basic layup, after dribbling, with the right hand	6.16	.003
Basic layup, after dribbling, with the left hand	2.73	.072
Basic layup, after catching a pass, with the right hand	3.57	.033
Basic layup, after catching a pass, with the left hand	2.19	.119
Passing and catching the ball in a static position	1.36	.263
Passing and catching the ball while in movement	3.47	.036
Stopping	1.72	.186
Shot from the mid-range (4m)	4.00	.022

Six out of the twelve variables which were included in this research in the domain of elements of basketball technique demonstrated statistically considerably different results among the three subgroups, or, in other words, among the methods of learning

motor skills after completing a six-month program (speed dribbling with the right hand p=.008, speed dribbling with the left hand p=.016, the basic layup after dribbling with the right hand p=.003, the basic layup after catching a pass with the right hand p=.033, passing the ball while in movement p=.036, shot from the mid-range p=.022).

Discussion

According to the presented results, it can be stated that three months, the period which passed from the initial, that is, the starting condition when the subjects were beginners with no specific motor skills in the basketball domain, was too short a period for the realization of a statistically considerable difference in the development of the specific motor skills in relation to different methods of motor learning. It needs to be emphasized that within the framework of this research, three training sessions a week were organized and it remains questionable if the results would have been different if there had been a larger number of training sessions.

It is an interesting fact that the element which received the highest grades, including all three subgroups, was the basic layup after dribbling with the right hand[2]. The average grade of all three subgroups together totals 2.45. There are two reasons for this average grade which account for such a level of acquisition of this particular element. The first reason is the order of acquisition by which it was determined for this element to be taught immediately before the assessment, so this element was most insisted on during this period. The second reason, according to the evaluation of an independent team of experts who conducted the assessment, is an above average high acquisition level of the first phase in the learning of this element in terms of quality, regardless of the learning method which was applied. However, it should be taken into account when regarding this particular element that, although not considerably statistically different, the descriptive values of average grades within this period which had been calculated by using the analytical training method resulted in an average grade of 2.78, while the lowest average grade was calculated from the grades of subjects who had trained using the situational method, 2.26.

The most complex element within the domain of the specific motor skills in the second assessment, according to the average grades of all subgroups, is the basic layup after catching a pass with the left hand (average grade – 0.723), which was expected. This element is exceptionally demanding since, according to its structure, it requires cooperation between two players, the passer and the receiver, and it also combines several techniques – ball catching, starting a layup movement, rebounding, the basic layup and landing. If we add performing with the inferior hand, which, during this research in 94% of the cases was the left hand, it is clear why this was the most demanding and the lowest graded element in the first assessment.

While conducting a complete result analysis of the specific motor skills after the

[2] For 94% of the children in this research their right hand is considered as their dominant hand.

transition measurement, it should be taken into consideration that the subjects were children aged between nine and ten, who had never before participated in any kind of sports program aside from their regular physical training in schools, which did not include the acquisition of any elements of basketball technique or other basketball programs. Due to this fact, a conclusion can be made that these results mostly indicate the children's understanding of the manner of performance of most elements which were demanded, and this "transition" phase can be considered successful. None of the learning methods achieved considerable statistical differences in relation to the other two methods during this period. This fact can be considered as expected with regard to the short duration of the program at that point (three months). Nevertheless, when observing the differences between their arithmetic mean, certain trends have been defined. These trends were even more manifested by the end of the research, and some also demonstrated a statistical importance between particular differences in the end.

The results of the final measurement demonstrated an improvement in the results of all variables, as was expected. In the course of the six-month program the children involved in it demonstrated an upgrade of their specific motor skills fund. As compared to the results of the first measurement, the grade of individual elements improved on average by 0.9, within a range of grades between zero and five. While observing all three subgroups together, the largest improvements were achieved by the following elements: static dribbling (1.2 – with the right hand, 1.0 – with the left hand), and the shot from the mid-range (1.1). Both results can be logically explained. Static dribbling as an exercise is included in almost every training session, and such a number of repetitions improve its quality, as well as the stability of its performance. According to the program in which the children participated, basketball shooting was covered in its second phase, that is, after the transition measurement. As a result of this fact it was expected that the results would be improved when compared to the previous ones, after this element was practiced. It should be taken into consideration that the children also practiced shooting in the first half of the program, especially during play or some other forms of modified competitions. However, major improvements were made only during the second half of the program.

The elements which received the highest grades after the final measurement, taking into account all three subgroups together, are the following: static dribbling (both with the right and the left hand), the basic layup after dribbling with the right hand and the shot from the mid-range. The elements with the worst grades are the basic layups after catching a pass (both with the right and the left hand).

The elements of basketball technique which include static dribbling have already been explained, while the basic layup after dribbling with the right hand can be considered as the exemplary, fundamental and primary element of this period to which a great deal of attention was devoted. The shot from the mid-range is methodologically easiest to deal with from the motivational point of view. Every child who enters the basketball court wants to score a point, which is the fundamental goal of the game.

As a result of this fact, children approach all exercises which include this particular element exceptionally motivated and concentrated, and consequently they achieve higher results.

As expected, the basic layup after catching a pass with the left and right hand received the lowest grades, as the most difficult and structurally most demanding element during the first six-month period of learning for beginners. The fact that most of the children mastered the rough form of performing this element while using their dominant hand can be considered a success. This element of basketball technique should be perfected in the following period of learning in order for it to reach a level of performance that could be applied during play, since at this stage this was still not the case.

The elements of basic basketball technique, as well as the level of success in playing basketball, which had been evaluated through grades given by experts, in most cases demonstrated positive improvements as a result of the synthetic learning method. The effects of the analytical learning method also demonstrated positive results and they included somewhat less noticeable improvements, except in the case of learning the elements of the basic layup, when this method demonstrated to be the most successful. The situational method, even though achieving positive effects in the acquisition of the specific motor skills, demonstrated the lowest results and showed no major improvements in any of the variables in this program.

The basic quality of the synthetic method in learning the simplest structures when compared to the analytical method is the possibility of creating a complete image or enabling a coherent acquisition of the assigned element from the very beginning. In this way there are no potential hidden dangers concerning the rhythm of performing or joining the elements into a whole, as there are when applying the analytical method. This kind of transformation or joining involves problems of restructuring the automatized dynamic-motor stereotypes, as well as limited possibilities of joining them into a dynamic whole. This also constitutes the major disadvantage of the analytical learning method with regard to the synthetic method. The analytical method, as it was already mentioned, always aims at dividing the elements into more logical and meaningful segments. However, the determinant of this goal is not always clear or is inadequately defined. Another significant factor – which results in the superiority of the synthetic method in most variables – is also a higher level of motivation in children, since their goal or the final performance of the element is much more easily understood when resorting to the synthetic approach than it is when the assignment is divided into sections.

It is definitely true that the downside of the analytical method as compared to the synthetic method in this research was a lower number of repetitions while performing the elements of basketball technique as a whole, which also, among other factors, resulted in weaker effects during the six-month period.

An advantage of the analytical method, in relation to both the synthetic and situational method, is mastering more complex structures which consist of logical

and easily joined together phases in their performance (Hellebrandt, 1972). In these cases children are more successful at mastering individual phases without making mistakes in performing details. After the acquisition of individual phases, their logical joining leads to a more successful performance of a complex movement as a whole.

This research has demonstrated that the process of learning in the case of the basic layup (after dribbling and after catching a pass) should be implemented among beginners by using the analytical approach, that is, the analytical method of learning.

Basketball is a team sport which requires the restructuring of motor programs in the course of an activity due to the occurrence of new situations. Therefore, besides coordination, the ability to transfer from one type of motor program to another, which is in accordance with the newly established situation, is very important (Pollatou, Michalopoulou & Taxidaris, 1995; Zhang, 2001). This implies that the capability of understanding a new situation and making transition from one type of motor program to another must be well developed. In the process, it is necessary to optimally perform the new motor assignment in keeping with the newly established situation. The synthetic training method enables a variation of motor assignments following some kind of random system, which provides the opportunity to practice the recognition of new situations, reprogramming and the performance of new assignments (Blakemore et al., 1992; Shea, Magnussen & Wilde, 2005).

The situational method did not succeed in fulfilling its purpose to an adequate degree as a result of including situational factors in the process of learning new elements, which were unknown to the children. In the attempt to modify their movements in accordance with the situational conditions, the children did not sufficiently acknowledge the basic movement structures or the details of their performance. Based on this fact, the effects are inadequate in relation to the hard work. Consequently, the remaining two methods which were involved in this research (synthetic and analytical) demonstrated better results in the process of learning the basic elements of basketball technique. The situational method should be applied only after the elements have been structurally acquired to a certain degree. Prskalo et al. (2005) obtained similar results while studying the differences in the efficiency of the teaching methods in PE with children aged 7-10. The authors found that the synthetic method of teaching the forward roll was more appropriate for children of this age span. They connected their findings with a more developed synthetic way of thinking rather than the analytical one in young children.

Conclusion

Generally, it can be concluded that the synthetic method is the most favorable method of motor learning when teaching most elements to basketball beginners, while the analytical method is more successful in teaching the complex elements, such as the basic layup after dribbling or the basic layup after catching a pass. The situational method proved to be too demanding for the population of basketball beginners and

its effects were found as inadequate. It is important to determine the most adequate method of motor learning while programming the training sessions, since this ensures the optimum effect of work in relation to the time and the efforts which are invested.

In the end, it can be declared that the synthetic method of motor learning is most applicable in the process of basketball training for the population of young school-age children (nine to ten years old) who are basketball beginners, while the analytical method should be applied in the process of motor learning of the structurally complex elements.

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Vrijednost aplikativnih metoda motoričkog učenja u radu s košarkaškim početnicima

Sažetak

Cilj je ovog istraživanja bio utvrditi djelotvornost metoda učenja – analitičke, sintetičke, situacijske, u poduci košarkaške igre. Uzorak ispitanika činilo je 90 dječaka uzrasta od 9 do 10 godina, košarkaških početnika. Proveden je šestomjesečni program rada koji se razlikovao jedino prema navedenim metodama učenja između odabranih podskupina. Procjena efekata pojedinih metoda učenja provedena je uvidom u razvoj specifičnih motoričkih znanja – temeljnih elemenata košarkaške tehnike i uspješnosti u igri. Učinci programa analizirani su jednosmjernom analizom varijance.

Kineziološki program kojemu su bili podvrgnuti ispitanici uključivao je tri košarkaška treninga tjedno i nastavu tjelesne i zdravstvene kulture. Tijekom trajanja programa došlo je do značajnih pozitivnih promjena, neovisno o metodi učenja u svim testovima za procjenu specifičnih motoričkih znanja. Najveći pomaci kako kod većine elemenata košarkaške tehnike tako i kod uspješnosti u igri uočljivi su uvidom u rezultate grupe koja je trenirala sintetičkom metodom učenja. Analitička metoda pokazala se najprimjenjivijom kod usvajanja složenijih elemenata osnovne košarkaške tehnike, dok su pozitivni efekti situacijske metode bili najmanje izraženi. Prema dobivenim rezultatima i provedenoj analizi može se zaključiti da je za populaciju djece, košarkaških početnika, u procesu učenja košarkaške igre najprimjenjivija sintetička metoda, dok bi se analitička metoda trebala primjenjivati u procesu učenja strukturalno složenih elemenata.

Ključne riječi: *djeca mlađe školske dobi; košarka; metode učenja.*

Uvod

Košarkaška tehnika osnovno je sredstvo u košarci s pomoću kojeg se ostvaruje njezin osnovni cilj – pobjeda na kraju utakmice. Košarkaška tehnika u sebi sadrži kretne strukture koje izvode igrači s loptom i bez nje, u skladu s pravilima igre. One predstavljaju racionalna, ekonomična, ritmična i prije svega djelotvorna kretanja, omogućuju igračima rješavanje nastalih situacija tijekom igre. Time elementi

košarkaške tehnike omogućuju da se strategijske, taktičke zamisli provedu u djelo na terenu, odnosno realiziraju. Visok stupanj usvojenosti specifičnih motoričkih znanja omogućit će djelotvorniju realizaciju taktičkih zamisli i time najvjerojatnije dovesti do uspjeha u igri. Uspjeh u igri visoko je predodređen poznavanjem elemenata košarkaške tehnike – specifičnim motoričkim znanjima u košarkaškoj igri. Košarkaška tehnika iznimno je bogata. Čine je motorički programi za izvođenje specifičnih košarkaških struktura kretanja. Kako bi se usvojile određene specifične košarkaške motoričke strukture, potrebno je aktivno sudjelovanje u dugotrajnom procesu učenja i vježbanja, odnosno košarkaškom treningu. Pod njegovim utjecajem košarkaš dolazi do razine kada su mu sposobnosti i znanja toliko razvijeni da svrsishodno upravlja gibanjima tijekom izvođenja dinamičkih stereotipa potrebnih u košarkaškoj igri (Matković 2010.).

Dosadašnja istraživanja (Krause, Meyer i Meyer 1998.) pokazuju da je osnovnu tehniku potrebno naučiti što ranije, tijekom devete, desete godine, dok se u programima mini košarke počinje učiti i ranije, u dobi od sedme do devete godine (Knjaz 2000.), dakle uključivanjem početnika u proces sustavnog učenja i vježbanja košarkaške igre. Nekorektno naučeni i automatizirani elementi košarkaške tehnike vrlo se teško ispravljaju pa je zato zadatak sportskog treninga od samog početka stvarati, formirati savršene stereotipe, kako bi tehnika postala kvalitetna, stabilna i automatizirana motorička navika (Memmert 2006.).

U postupcima učenja u sportu, pa tako i u košarci, postoje tri osnovne metode učenja (Appelton 1969; Oreb 1984; Singer 1990; Silverman 1994; Scmidt & Wrisberg, 2000.; Coutinho & SantosSilva, 2009.):

- analitička – podrazumijeva postupak u kojem se cjelovitu strukturu gibanja dijeli na više segmenata koji se uče, odnosno svladavaju zasebno,
- sintetička – podrazumijeva usvajanje i usavršavanje motoričkog zadatka u cijelosti,
- situacijska – temelji se na učenju elemenata košarkaške tehnike u tipično situacijskim uvjetima košarkaške igre.

Osnovni cilj istraživanja ovog rada je utvrditi vrijednost triju aplikativnih metoda – analitičke, sintetičke i situacijske – tijekom učenja i usavršavanja osnovnih elemenata košarkaške tehnike.

Metode istraživanja

Uzorak ispitanika čini 90 dječaka u dobi od 9 i 10 godina, košarkaških početnika koji prije uključenja u program istraživanja nisu sudjelovali u sportskom programu bilo kakve vrste. Također, tijekom provođenja istraživanja dječaci nisu sudjelovali u drugim sportskim programima osim u redovnoj nastavi tjelesne i zdravstvene kulture u matičnim osnovnim školama. Kako bi se pokušalo preliminarno formirati podjednake podskupine ispitanika, djece košarkaških početnika s obzirom na njihova antropometrijska obilježja i motoričke sposobnosti, provedeno je predtestiranje (Knjaz, 2005.). Ono je uključilo mjerenje visine i mase tijela, kao i testove za procjenu

motoričkih sposobnosti (poligon natraške, trčanje na 20 metara, skok u dalj iz mjesta). Također je učinjen pokušaj ocjenjivanja izvedbe pojedinih elemenata košarkaške tehnike. Uočeno je da djeca te dobi, košarkaški početnici, nemaju predodžbu o načinu izvođenja zadanih elemenata i da nisu u stanju demonstrirati tražene elemente niti u najgrubljoj formi. Zbog toga se odustalo od predtestiranja tog segmenta. Na temelju rezultata predtestiranja podskupine su formirane tako da su djeca približno istih rezultata disperzirana u različite podskupine, čime je uzorak podijeljen u tri jednako brojne grupe od kojih je svaka tijekom provođenja procesa treninga učila elemente košarkaške igre uz pomoć različitih metoda (sintetičke, analitičke, odnosno situacijske). U sklopu programa koji je trajao šest mjeseci provođena su tri treninga tjedno, svaki u trajanju od 60 minuta.

Specifična motorička znanja u području košarkaške igre procijenjena su kod ispitanika na temelju ocjena donesenih od pet educiranih, uvježbanih i neovisnih košarkaških eksperata koji su imali najmanje tri godine iskustva u radu s djecom u programima mini košarke ili škole košarke (Knjaz 2000; Zhang 2001.). Ocjenjivanje je provedeno prvi put poslije 3 mjeseca provođenja programa i drugi put na kraju provedbe programa, kao tranzitivno i finalno mjerenje.

Skala ocjena kretala se u rasponu od nula do pet.

Košarkaški eksperti ocjenjivali su ove elemente:

1. vođenje lopte u mjestu desnom rukom
2. vođenje lopte u mjestu lijevom rukom
3. vođenje lopte u kretanju desnom rukom
4. vođenje lopte u kretanju lijevom rukom
5. osnovno ubacivanje nakon vođenja desnom rukom
6. osnovno ubacivanje nakon vođenja lijevom rukom
7. osnovno ubacivanje nakon hvatanja dodane lopte desnom rukom
8. osnovno ubacivanje nakon hvatanja dodane lopte lijevom rukom
9. tri tehnike dodavanja[3] lopte u mjestu (dodavanje s dvije ruke s grudi, dodavanje s jednom rukom guranjem, dodavanje s dvije ruke iznad glave)
10. dodavanje i hvatanje lopte u kretanju
11. zaustavljanje
12. šut na koš s poludistance (4m).

U sklopu deskriptivne statistike izmjerene vrijednosti varijabli obrađene su standardnim postupcima kako bi se utvrdile njihove osnovne statističke karakteristike. Izračunate su aritmetičke sredine, standardne devijacije i standardne pogreške. Za svaku varijablu utvrđena je minimalna i maksimalna vrijednost. Kolmogorov-Smirnovljevim postupkom testirana je hipoteza o normalitetu distribucije svake pojedine varijable.

[3] Konačnu ocjenu tog elementa činila je aritmetička sredina triju ocjena navedenih tehnika dodavanja.

S obzirom na postavljeni problem i nacrt provedenog istraživanja (kvazieksperimentalni) najpogodnija statistička analiza prikupljenih rezultata je analiza varijance i to višesmjerna analiza varijance koja daje statističke podatke na kojima se može temeljiti jasniji zaključak o relativnoj uspješnosti pojedinog tretmana u košarkaškoj igri. Obrada podataka je izvršena na stupnju značajnosti (p) - .05. Podaci su obrađeni programom *SPSS for Windows.*

Rezultati

Dobiveni rezultati prikazani su u tablicama. U Tablici 1. prikazani su osnovni deskriptivni statistički pokazatelji testova specifičnih motoričkih sposobnosti za sve tri subgrupe poslije tri mjeseca rada, dok su u Tablici 2. rezultati ostvareni poslije šest mjeseci. Prema Kolmogorov-Smirnovljevu testu, svi dobiveni rezultati ne odstupaju od normalne distribucije.

Procjenu uspješnosti izvođenja elemenata košarkaške tehnike, kao i uspješnost u igri, utvrdili su košarkaški eksperti prema unaprijed dogovorenim kriterijima ocjenama od nula do pet. Ekspertne ocjene i inače su prisutne u kineziološkim istraživanjima u smislu utvrđivanja efikasnosti u različitim sportskim aktivnostima. Tako je objavljen niz radova u kojima je uspješnost u košarkaškoj igri bila utemeljena na sudačkim ocjenama (Blašković i sur., 1983., Matković 1992.).

Tablica 1.

Prosječni rezultati različitih testova u tranzitivnom i finalnom mjerenju, kao što je i očekivano, variraju, jer i ti elementi variraju s obzirom na svoju strukturu i složenost izvedbe i usvajanja pojedinih struktura, kao i redoslijed njihova usvajanja. U finalnom mjerenju ocjene su značajno bolje od onih poslije tri mjeseca treninga.

Tablica 2.

Rezultati testiranja razlika u postignuću djece podvrgnute različitim metodama učenja prikazani su u Tablici 3. za tranzitivno mjerenje i u Tablici 4. za finalno mjerenje.

Tablica 3.

Rezultati u Tablici 3. pokazuju da nisu ostvarene statistički značajne razlike između podskupina iako je uočena razlika između vrijednosti aritmetičkih sredina. Najveće razlike između aritmetičkih sredina ostvarene su u testovima: vođenje lopte u kretanju lijevom rukom, osnovno ubacivanje nakon vođenja desnom rukom, osnovno ubacivanje nakon vođenja lijevom rukom.

Tablica 4.

Od dvanaest varijabli uključenih u ovo istraživanje u području elemenata košarkaške tehnike šest je pokazalo statistički značajno različite rezultate između podskupina, odnosno metoda učenja nakon provedbe šestomjesečnog programa (vođenje lopte u kretanju desnom rukom p = .008, vođenje lopte u kretanju lijevom rukom p = .016,

osnovno ubacivanje nakon vođenja desnom rukom p = .003, osnovno ubacivanje nakon hvatanja dodane lopte desnom rukom p = .033, dodavanje lopte u kretanju p = .036, šut na koš s poludistance p = .022).

Rasprava

Prema dobivenim rezultatima može se tvrditi da je razdoblje od tri mjeseca, koliko je proteklo od inicijalnog, tj. nultog stanja kada su ispitanici bili početnici, odnosno bez specifičnih motoričkih znanja u području košarkaške igre do tranzitivnog mjerenja, prekratko da bi se ostvarile statistički značajne razlike u razvoju specifičnih motoričkih znanja u odnosu na različite metode učenja. Potrebno je naglasiti da su u sklopu ovog istraživanja provedena tri treninga tjedno te ostaje upitno bi li rezultati bili drugačiji da je broj treninga bio veći.

Zanimljiv je podatak da je najbolje ocijenjen element (uključujući sve tri podskupine) u drugom mjerenju: osnovno ubacivanje nakon vođenja desnom[4] rukom. Prosječna ocjena svih skupina zajedno iznosi 2.45. Dva su razloga za tu prosječnu ocjenu, odnosno za taj stupanj usvojenosti elementa. Prvi je redoslijed usvajanja kojim je određeno da se taj element uči neposredno prije testiranja pa se na njemu u tom vremenu najviše inzistiralo. Drugi je razlog, prema procjeni neovisnog ekspertnog tima koji je proveo ocjenjivanje, u principu iznadprosječno kvalitetno usvojena prva faza učenja ovog elementa, bez obzira na metodu učenja. Ipak treba uzeti u obzir da je kod tog elementa, iako ne statistički značajno različito, deskriptivne vrijednosti prosječnih ocjena u ovom periodu polučena analitička metoda s prosječnom ocjenom 2.78 ,dok se najslabija prosječna vrijednost primjećuje u ocjenama ispitanika koji su trenirali situacijskom metodom, 2.26.

Najteži element u području specifičnih motoričkih znanja u drugom mjerenju prema prosjeku ocjena svih podskupina je osnovno ubacivanje nakon hvatanja dodane lopte lijevom rukom (prosječna ocjena – 0.723), što je i bilo očekivano. Taj element iznimno je zahtjevan jer po svojoj strukturi zahtijeva suradnju dva igrača, dodavača i hvatača i objedinjuje tehnike hvatanja lopte, polazak u dvokorak, odraz, osnovno ubacivanje te doskok. Ako tome dodamo izvođenje slabijom rukom, a to je u 98% slučajeva u ovom istraživanju bila lijeva ruka, jasno je zbog čega je to najzahtjevniji i najslabije ocijenjen element u prvom mjerenju.

U kompletnoj analizi rezultata specifičnih motoričkih znanja nakon tranzitivnog mjerenja treba uzeti u obzir da su ispitanici bila djeca u dobi između 9 i 10 godina koja prije toga nisu bila uključena u ni u jedan sportski program osim redovite nastave tjelesne i zdravstvene kulture kojom nije predviđeno savladavanje bilo kojih elemenata košarkaške tehnike ili drugih košarkaških programa. Zbog toga možemo zaključiti da navedeni rezultati uglavnom ukazuju na razumijevanje djece o načinu izvođenja većine elemenata koji se od njih zahtijevaju, pa se ta faza može smatrati uspješnom.

[4] Za 98% djece u ovom istraživanju desna je bila dominantna ruka.

Ni jednom metodom nisu u ovom razdoblju ostvarene statistički značajne razlike u odnosu na druge dvije. To se može smatrati očekivanim s obzirom na kratko razdoblje dotadašnjeg tijeka programa (tri mjeseca). Ipak, na razini razlika aritmetičkih sredina uočeni su neki trendovi koji su još više došli do izražaja na kraju istraživanja te su poneki i pokazali statističku značajnost razlika u svojoj konačnici.

Rezultati finalnog mjerenja pokazali su da su poboljšani rezultati svih varijabli, što je bilo i očekivano. Šestomjesečnim programom unaprijeđen je fond specifičnih motoričkih znanja uključene djece. U prosjeku elementi su napredovali za 0.9 ocjene u rasponu ocjena od 0 do 5 u odnosu na rezultate prvog mjerenja. Najviše su napredovali, gledajući sve tri podskupine zajedno, ovi elementi: vođenje lopte u mjestu (1.2 – desnom rukom, 1.0 lijevom rukom) i šut na koš s poludistance (1.1). Oba se rezultata mogu logički objasniti. Vođenje lopte u mjestu kao vježba uključuje se u gotovo svakom treningu, pa se brojem ponavljanja unapređuje kvaliteta, a time i sigurnost njegova izvođenja. Šut na koš se prema programu prema kojem su djeca radila obrađivao u svojoj drugoj fazi, odnosno poslije tranzitivnog mjerenja. Zbog toga je očekivano da će rezultat nakon obrađene teme biti kvalitetniji nego prije. Treba uzeti u obzir da su djeca i u prvoj polovini programa također šutirala na koš, naročito tijekom igre ili nekih oblika modificiranih natjecanja. No kvalitetni pomaci učinjeni su tek u drugoj polovini programa.

Najbolje ocijenjeni elementi nakon finalnog mjerenja, uzimajući sve tri podskupine zajedno, jesu: vođenje lopte u mjestu (desnom i lijevom rukom), osnovno ubacivanje nakon vođenja desnom rukom i šut na koš s poludistance. Najlošije ocijenjeni elementi su: osnovno ubacivanje nakon hvatanja dodane lopte (desnom i lijevom rukom).

Elementi košarkaške tehnike koji uključuju vođenje lopte u mjestu već su objašnjeni, a osnovno ubacivanje nakon vođenja desnom rukom može se smatrati uzornim, temeljnim, primarnim elementom ovog razdoblja pa mu se posvetilo mnogo pažnje. Šut na koš s poludistance metodološki je najlakše obraditi s motivacijskog gledišta. Svako dijete ulaskom u dvoranu pokušava postići koš, a to je i temeljni cilj košarkaške igre. Zbog toga svim vježbama u kojima je uključen taj element djeca pristupaju iznimno motivirano i koncentrirano, pa su stoga i efekti bolji.

Prema očekivanju, kod osnovnog ubacivanja nakon hvatanja dodane lopte lijevom i desnom rukom kao najtežeg, strukturalno najzahtjevnijeg elementa u prvom šestomjesečnom razdoblju poduke početnika, dobivene su najlošije ocjene. Može se smatrati uspjehom da je većina djece savladala grubu formu izvođenje tog elementa boljom rukom. Taj element košarkaške tehnike trebao bi se u narednom razdoblju rada s djecom usavršavati kako bi se doveo na razinu primjenjivu tijekom košarkaške igre, jer u ovom trenutku to još nije slučaj.

Elementi temeljne košarkaške tehnike i uspješnost u košarkaškoj igri, procijenjeni u ocjenama eksperata, u najvećem su broju slučajeva pozitivno unaprijeđeni djelovanjem sintetičke metode učenja. Efekti analitičke metode odvijali su se također pozitivno, s nešto manje izraženim efektima, osim u elementima poduke osnovnog ubacivanja koja

se u ovom slučaju pokazala kao najuspješnijom. Situacijska metoda, iako je ostvarila pozitivne pomake u području stjecanja specifičnih motoričkih znanja i uspješnosti u igri, ostvarila je najslabije rezultate, i ni u jednoj varijabli ovog prostora nije ostvarila najznačajnije pomake.

Osnovna kvaliteta sintetičke metode kod učenja jednostavnijih struktura u odnosu na analitičku metodu je mogućnost stvaranja cjelovite slike ili cjelovitog usvajanja zadanog elementa od samog početka. Na taj način ne postoje moguće nepoznanice, kao kod primjene analitičke metode, o ritmu izvođenja ili povezivanja (spajanja) elementa u cjelinu. To transformiranje, odnosno spajanje, u sebi sadrži probleme restrukturiranja automatiziranih dinamičko-motoričkih stereotipa, a time i ograničene mogućnosti povezivanja u dinamičku cjelinu. To je i glavni nedostatak analitičke metode učenja u odnosu na sintetičku. U analitičkoj metodi rada, kao što je već rečeno, elementi se nastoje uvijek raščlaniti na što logičnije, smislenije segmente. Međutim, determinanta cilja ponekad nije sasvim jasna ili je slabo definirana. Također, značajan faktor – koji ima kao posljedicu superiornost sintetičke metode u većini varijabli – jest i veća motiviranost kod djece, budući da im je cilj ili konačna izvedba elementa daleko jasnija kada koriste sintetički pristup, nego kada zadatak moraju raščlaniti.

Definitivno stoji da je nedostatak analitičke metode u odnosu na sintetičku, u ovom istraživanju, bio manji broj ponavljanja elemenata tehnike u cijelosti, što je također, među ostalim, dovelo do slabijih efekata u šestomjesečnom razdoblju.

Dobra strana analitičke metode u odnosu na sintetičku i, naravno, situacijsku, je savladavanje složenijih struktura koje imaju logične i lako spojive faze izvedbe (Hellebrandt 1972.). Tada djeca lakše svladavaju pojedine faze ne čineći pogreške u detaljima izvedbe. Nakon usvajanja faza njihovo logično spajanje dovodi do uspješnijeg izvođenja složenoga gibanja u cijelosti.

Ovo istraživanje je pokazalo da se proces učenja osnovnog ubacivanja (nakon vođenja i nakon hvatanja dodane lopte) kod početnika treba izvoditi analitičkim pristupom, odnosno analitičkom metodom učenja.

Košarka je sport, momčadska igra koja zahtijeva prestrukturiranje motoričkih programa u toku aktivnosti zbog pojavljivanja novih situacija, tako da je uz koordinaciju bitna sposobnost prijelaza s jednog motoričkog programa na drugi, u skladu s novonastalom situacijom (Pollatou, Michalopoulou i Taxidaris 1995; Zhang 2001.). To znači da mora biti dobro razvijena sposobnost razumijevanja nove situacije i prijelaz s jednoga motoričkog programa na drugi. Pri tome je potrebno optimalno izvođenje novoga motoričkog zadatka u skladu s novonastalom situacijom. Sintetička metoda treninga omogućuje variranje motoričkih zadataka po nekakvom slučajnom sustavu, što omogućuje vježbanje prepoznavanja novih situacija, preprogramiranje i izvođenje novih zadataka (Blakemore i sur. 1992; Shea, Magnussen i Wilde, 2005.).

Situacijskom se metodom, zbog uključivanja situacijskih faktora u proces učenja novih, djeci nepoznatih elemenata, nije uspjelo u dovoljnoj mjeri ostvariti ciljeve. Djeca su prema situacijskim uvjetima modificirala svoje kretnje ne uvažavajući

osnovne strukture gibanja ili detalje izvedbe. Efekti su zbog toga nesrazmjerni uloženom trudu. Prema tome, u konačnici efekti ostale dvije metode, sintetičke i analitičke, u procesu učenja temeljnih elemenata košarkaške tehnike uključeni u ovo istraživanje su veći pa bi situacijsku metodu trebalo primjenjivati tek nakon što su elementi strukturalno usvojeni na određenom stupnju. Slične je rezultate dobio i Prskalo sa svojim suradnicima (2005.) analizirajući uspješnost različitih metoda učenja u nastavi TZK kod djece uzrasta od sedam do deset godina. Autori su utvrdili kako je za učenje koluta naprijed najpovoljnija sintetička metoda. Svoje su zaključke povezali s nedovoljno razvijenom sposobnošću analitičkog razmišljanja kod djece tog uzrasta.

Zaključak

Općenito se može zaključiti da je za košarkaške početnike najpovoljnija metoda učenja većine elemenata sintetička metoda, dok je analitička metoda uspješnija u učenju složenih elemenata kao što su osnovno ubacivanje nakon vođenja ili osnovno ubacivanje nakon hvatanja dodane lopte. Situacijska metoda se za populaciju košarkaških početnika pokazala kao prezahtjevna pa njezini efekti nisu adekvatni. Bitno je prilikom programiranja odrediti najprimjereniju metodu učenja jer se na taj način optimalizira efekt rada u odnosu na uloženo vrijeme i trud. Možemo tvrditi da je za populaciju djece mlađe školske dobi (9 – 10 g.), košarkaških početnika, u procesu obuke košarke najprimjenjivija sintetička metoda, dok bi se analitička metoda trebala primjenjivati u procesu učenja strukturalno složenih elemenata.