

EFFICIENCY OF TECHNICAL AND TACTICAL APPROACH TO TEACHING MINIHANDBALL GAME SKILLS IN DIFFERENT AGE CATEGORIES

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Summary: The aim of the study was to verify the efficiency of a traditional (technical) approach and a tactical game based approach to teaching minihandball game skills the first- to fourth-grade elementary school pupils. The experimental design was two parallel-group trials. Experimental groups (EG) were taught by the tactical approach where modified and small-sided games comprised 80 % and drill-exercises 20 % of all the units. Control groups (CG) were taught by the technical approach where drill exercises comprised 70 % and modified and small-sided games 30 % of all the units. Two groups of first- and second-graders (EG n=16, CG n=17) and two groups of third- and fourth-graders (both EG and CG n=12) attending extracurricular activities oriented to minihandball participated in the study. The technique of offensive game skills (overarm pass, dribbling and shot) was evaluated by 1 to 5 scoring system. For statistical analysis, Wilcoxon's T-test and Man-Whitney's U-test were used and the level of significance was set to 5 %. Based on the results it can be stated that the tactical approach is as efficient as a technical approach on game skills' technique acquirement. Results showed significant changes in the technique of game skills in both age categories ($p < 0.01$). No significant differences between age categories were confirmed in game skill tests besides the dribbling test where the older experimental group (third- and fourth-graders) achieved better performance than the younger experimental group (first- and second-graders).

Key words: technical approach, tactical approach, game skills, minihandball, children

Introduction

This study focuses on the question how to teach primarily due to creating a relationship with physical activity, Physical Education (PE) and sports as a part of a lifestyle and a prerequisite for a lifelong healthcare (Antala 2012). Nowadays the main role of the teacher is to win the pupils' favour for physical activities and the best way to achieve such a goal is a game. For Psotta (2009) the crucial question of didactics of sports games is „what and how to teach“. Traditional approach to teaching sports games prefers technique to playing. It misses a phase of tactics acquirement whereas the major focus is on the technique of game skills via drill exercises. An alternative way to the traditional (technical) approach called Teaching Games for Understanding (TGfU) (Griffin et al. 1997; Mitchell et al. 2003; Psotta 2010) links tactics and skills by emphasizing the appropriate timing of skill practice and application within the tactical context of the game. Founders of TGfU are Rod Thorpe, David Bunker and Len Almond. They presented the model to the public in 1982. Thorpe, Bunker and Almond (1986) asserted 6 phases of learning sport games: game – game appreciation – tactical awareness – decision making (How to do?) – skill execution – game performance. Griffin et al. (1997) simplified this model to 3 steps: Understanding the basic rules and tactics in small-sided game, deciding what to do (tactics), and learning game skills (technique) in adequate game forms. This concept of teaching has gradually spread around the world and it is known under different names: Concept Approach (Wright et al. 2005), Tactical Game Approach (Griffin et al. 1997), Tactical Decision Learning Model (Gréhaigne, Richard and Griffin 2005), Play Practice (Lauder 2001) etc.

There has been evidence that the TGfU and similar approaches are more efficient than traditional (technical) approach. Allison and Thorpe (1997) in ice hockey, Dalton (2009) in basketball, Psotta and Martin (2011) in football, Popelka (2012) in volleyball, Žuffová (2012, 2015) in frisbee ultimate, Zapletalová and Řezníčková (2015, in print) in badminton (Olosová 2015) refer to a better efficiency of the tactical approach on game performance and game knowledge. Moreover, they point out that both approaches lead to a similar level of acquired game skills. Further positive differences in favour of the tactical approach were found in pupils' interest in the content of the lessons. Nevertheless, there are only few studies that examine the teaching approaches or models in youngest school category (grade 1 and 2). Priklerová, Kucharik (2015, in print) examined the efficiency of technical and tactical approach on game performance in minihandball, Olosová and Zapletalová (2012) in

minibasketball. These papers report the possibility of use of tactical approach in this age categories and its better efficiency.

Aim

The aim of the study is to examine the efficiency of the tactical and technical approach in teaching minihandball game skills in pupils of the youngest school age categories.

Methods

Two experimental and two control groups participated in the study:

- EG₁₋₂ boys and girls, grade 1 and 2 at elementary school, n=16;
- EG₃₋₄ boys and girls, grade 3 and 4 at elementary school, n=12;
- CG₁₋₂ boys and girls, grade 1 and 2 at elementary school, n=17;
- CG₃₋₄ boys and girls, grade 3 and 4 at elementary school, n=12.

The intervention lasted for 10 weeks in duration of 60 min. per week. A total volume of physical activities was as follows: 60 min. warm-up (warm-up), main part 450 min., closing part 60 minutes (preparatory games, minihandball, stretching). A qualified handball coach together with educators led the intervention. Teaching programs differed in the ratio of methodological forms. Experimental groups were taught by the tactical approach where a tactical training comprised 80 % (360 min.) and technical training comprised 20 % (90 min.) of all the units (drill exercises 105 min., modified games 315 min., match 80 min.). Control groups were taught by the technical approach where the technical training comprised 70 % (315 min.) and the tactical training comprised 30 % (135 min.) of all the units (drill exercises 352 min., modified games 62 min., match 86 min.).

Game skills' technique (GS) was evaluated in tests overarm pass over a distance of 4 m, dribbling over a distance of 14 m and shot (from the ground) by 1 – 5 points scoring system from video recordings:

- 5 points GS - correct technique, quickly and accurately,
- 4 points GS - correct technique, slowly but accurately,
- 3 points GS - correct technique, slowly and inaccurately,
- 2 points GS - incorrect technique but quickly,
- 1 point GS - incorrect technique and slowly.

For statistical analysis, Wilcoxon's T-test was applied to compare the input and output results and Man-Whitney's U-test was applied to compare the differences between the experimental and the control group. The level of significance was set to 5 %.

Results and discussion

Firstly, we analyze results of the evaluation of game skills 'technique in the experimental (EG) and the control group (CG) of both age categories. Based on the results it can be confirmed that both approaches caused a significant improvement of evaluated game skills' technique. After 10 weeks the average score of younger groups improved significantly ($z=2.606$ to 3.379 ; $p<0.01$) in EG and CG, both (Tab. 1 and 2). When comparing an increase in median values the biggest increase (2 points) was found in the overarm pass in EG. In other cases, it was only a medium increase (1 point). In both groups, there were some pupils who did not improve at all but on the other hand, some pupils improved their score of 3 points and got the maximum point value.

Table 1

Input and output point values of game skills' technique in control group of 1st and 2nd graders

	Overarm pass			Dribbling			Shot		
	Input	Output	Difference	Input	Output	Difference	Input	Output	Difference
Average	1.588	2.765	1.176	2.059	2.824	0.765	1.706	2.765	1.059
Sd	0.712	1.033	0.728	0.899	1.074	0.903	0.920	0.831	0.556
Median	1	2	1	2	3	1	1	3	1
Min.	1	2	0	1	1	0	1	2	0
Max.	3	5	3	4	5	3	4	4	2
Range	2	3	3	3	4	3	3	2	2
T - test	3.379			2.606			3.379		
	p < 0.01			p < 0.01			p < 0.01		

Table 2

Input and output point values of game skills' technique in experimental group of 1st and 2nd graders

	Overarm pass			Dribbling			Shot		
	Input	Output	Difference	Input	Output	Difference	Input	Output	Difference
Average	1.813	3.438	1.625	2.563	3.438	0.875	2.125	3.313	1.188
Sd	0.750	1.209	0.806	0.892	1.153	0.619	1.025	1.078	0.834
Median	2	4	2	3	3.5	1	2	4	1
Min.	1	1	0	1	1	0	1	1	0
Max.	3	5	3	4	5	2	4	5	3
Range	2	4	3	3	4	2	3	4	3
T - test	3.379			3.020			3.145		
	p < 0.01			p < 0.01			p < 0.01		

There were no significant differences in medium increases of points between EG and CG ($z=0.1141$ to 0.72786 ; $p>0.05$) (tab. 3).

Table 3*Comparison of improvement between experimental and control group of 1st and 2nd graders*

	Overarm pass		Dribbling		Shot	
	CG	EG	CG	EG	CG	EG
Average	1.176	1.625	0.765	0.875	1.059	1.188
Sd	0.728	0.806	0.903	0.619	0.556	0.834
Median	1	2	1	1	1	1
Min.	0	0	0	0	0	0
Max.	3	3	3	2	2	3
Range	3	3	3	2	2	3
U – test (z)	0.1141		0.48392		0.72786	
	n. s.		n. s.		n. s.	

Similarly to younger pupils the average score of older groups (3rd and 4th graders) significantly improved ($z=2.890$ to 3.020 ; $p<0.01$) (tab. 4 a 5). The increase in median varies from 1 to 2 points. Same as in younger groups there were some pupils who did not improve and some pupils who improved their score of 3 points.

Table 4*Input and output point values of game skills 'technique in control group of 3rd and 4th graders*

	Overarm pass			Dribbling			Shot		
	Input	Output	Difference	Input	Output	Difference	Input	Output	Difference
Average	2.667	3.917	1.250	2.417	3.833	1.417	2.583	4.083	1.500
Sd	0.651	0.793	0.754	0.900	1.115	0.793	0.669	0.793	0.905
Median	3	4	1	2.5	3.5	1	2.5	4	1
Min.	2	3	0	1	2	0	2	3	0
Max.	4	5	3	4	5	3	4	5	3
Range	2	2	3	3	3	3	2	2	3
T - test	2.890			2.890			2.890		
	p < 0.01			p < 0.01			p < 0.01		

Table 5*Input and output point values of game skills 'technique in experimental group of 3rd and 4th graders*

	Overarm pass			Dribbling			Shot		
	Input	Output	Difference	Input	Output	Difference	Input	Output	Difference
Average	2.500	3.583	1.083	1.917	3.750	1.833	1.917	3.583	1.667
Sd	0.905	0.669	0.515	0.793	0.754	0.835	0.900	0.900	0.888
Median	2	3.5	1	2	4	2	2	3.5	1.5
Min.	1	3	0	1	3	0	1	2	1
Max.	4	5	2	3	5	3	3	5	4
Range	3	2	2	2	2	3	2	3	3
T - test	2.890			2.890			3.020		
	p < 0.01			p < 0.01			p < 0.01		

Comparing EG to CG of 3rd and 4th graders there were no significant differences found in favour of the technical approach ($z=0.2048$ to 0.72634) (tab. 6). Increases in point values of the technique were similar with regard to both median and range.

Table 6
Comparison of improvement between experimental and control group of 3rd and 4th graders

	Overarm pass		Dribbling		Shot	
	CG	EG	CG	EG	CG	EG
Average	1.250	1.083	1.417	1.833	1.500	1.667
Sd	0.754	0.515	0.793	0.835	0.905	0.888
Median	1	1	1	2	1	1.5
Min.	0	0	0	0	0	1
Max.	3	2	3	3	3	4
Range	3	2	3	3	3	3
U - test	0.3464		0.20408		0.72634	
	n. s.		n. s.		n. s.	

Comparing EG to CG in both age categories there were no significant differences in changes in the technique of game skill (tab. 7). These results indicate that on elementary school level the technique of game skills may be taught and learnt by small-sided games as well as by drill exercises. Our outcomes can be supported by results of Olosová and Zapletalová (2012) in minibasketball and in higher age categories by Žuffová (2012, 2015), Popelka (2012) and Olosová (2015). Because of young age of our groups and applied tactical approach in which we did not put the emphasis on technique we did not expect similar results. It turns out, however, that children in the age period 6 – 9 years learn very easily and quickly only by imitation when playing, and that the deliberate targeting on the technique is not necessary. On the contrary, other, more attractive teaching forms can be used.

Table 7
Age differences in improvement of game skills' technique

	Overarm pass		Dribbling		Shot	
	CG	EG	CG	EG	CG	EG
	x (points)		x (points)		x (points)	
1 st to 2 nd graders	1.18	1.62	1.06	1.19	0.76	0.88
3 rd to 4 th graders	1.25	1.08	1.50	1.67	1.42	1.83
U – test	0.1771	1.7641	1.9484	2.8086	1.1956	1.2302
	n.s.	n.s.	$p \leq 0.05$	$p < 0.01$	n.s.	n.s.

When comparing improvements of game skills' technique with regard to age, there were no significant differences in the improvement of overarm pass technique ($z=0.1771$; $p>0.05$) and shot technique ($z=1.1956$; $p>0.05$) between the younger and the older control group. However the improvement in dribbling technique was significantly higher in the older group ($z=1.9484$; $p\leq 0.05$). Similar results were confirmed in the experimental group. There were significant differences in improvements of dribbling technique between younger and older pupils in favour of the older group ($z=2.8086$; $p<0.01$). However, there were no significant differences in the improvement of overarm pass technique ($z=1.7641$; $p>0.05$) and shot technique ($z=1.2302$; $p>0.05$). Significant differences in dribbling technique may be explained with using rubber minihandball balls in this age category. Due to the rubber, the bounce is unstable and the dribbling coordination is very demanding, especially on kinesthetic differentiation abilities. Older boys and girls seem to have a higher level of such abilities. Results of our comparative study indicate that we may continue on learning fundamentals of sport games successfully and systematically in their mini-forms since entering the school. The teaching approach is not critical, however because we talk about youngest age categories we suggest using game based (tactical) approaches rather than the technical approach.

Conclusions

From the results of the work, we can conclude that the tactical and technical teaching approach is equally effective in teaching game skills. Nevertheless, compared to the technical approach, tactical approach provides pupils the joy of movement and fun, eliminates tedious and boring rehearsal of game skills and teaches the principles of fair play and tactical thinking which an integral part of game performance is. Play and a joy are more important than the technical mastery of activities and drills, in physical education in particular.

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