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INCREASING THE EFFECTIVENESS OF PHYSICAL EDUCATION BY INTRODUCING ADDITIONAL DANCESPORT CLASSES, BY APPLYING AN EXPERIMENTAL PROCEDURE WITH 12 TO 13 AGED BOYS

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(Original scientific paper)

Vlatko Pavleski[1], Zaklina Kovacevic Bozilova[1]
[1]Ss. Cyril and Methodius University, Faculty of Physical Education, Sport and Health, Dep. of Sport, Skopje, Republic of North Macedonia

Abstract

The basic subject of the research is the classes of physical education, in their fullness, but with particularly emphasized attention to those components that primarily express their efficacy, quality and expediency. The purpose of the research is to examine the possibility of improving the efficiency of the physical education classes by using an experimental model which determines the efficiency in the space of physical dimensions with the impact of experimental treatment: an additional 2 DanceSport classes per week. The sample consists of n = 100 respondents divided in two groups (control and experimental one) of 50 boys aged 12 to 13 years old. Balance assessment, flexibility, and segmentary speed tests have been applied (body lifting lying on the back, body lifting lying on the stomach, distance jumping from place and tapping with hand and foot). From the received results It can be concluded that the reason for the progress of physical abilities is the additional 2 DanceSport classes that have greatly contributed to the significant differences in certain tests. It is therefore recommended to make a correction in the curriculum and to increase the DanceSport classes in physical education, to increase the motivation for physical activity outside of educational activities, to monitor motor skills, to apply tests, and according to the results, to build a national strategy for the development and maintenance of motor skills of the young male population.

***Key Words**: Physical education, DanceSport classes, Motor skills, Physical activity, National strategy*

Introduction

Physical education occupies a significant place in the educational process and is a basic component of the pedagogical activity in the school. The process of physical education should fully satisfy the needs, interests and possibilities of the students, and hence the work programs should arise. The set goals and tasks cannot be achieved only through three hours of regular teaching. The tasks of physical education should be accomplished through daily physical exercise. Neither the educational nor the educational moment should be neglected, nor should the teaching be treated as a recreational activity or should it be completely focused on sports training. Efforts should be made to constantly improve the quality of teaching, to increase the interest and motivation of students for mass involvement in physical education activities, to modernize and intensify teaching, and to make the results known and convincing to students. Efforts should be made to develop among students a permanent attitude towards physical education, to create permanent habits for daily exercise, active rest and leisure. Through the teaching of physical education, students are trained to improve their physical condition, to discover the limits of their motor capabilities.

The purpose of physical education is for students to understand the meaning, value and significance of physical education for their physical development and health through various forms of systematic physical exercise and theoretical upbringing and education.

The goal is to build conditions in which students will experience joy through free engagement in sports and recreational activities through regular forms of systematic exercise.

Material

The subject of the research is the classes of physical education in their entirety, but with special emphasis on those components that primarily express their efficiency, quality and expediency.

The main purpose of the research is to examine the possibility of improving the efficiency of the classes of physical education, that is, determining the efficiency in motor dimensions under the influence of experimental treatment with additional 2 DanceSport classes per week.

Sample of respondents

The sample of respondents included boys aged 12-13. It consists of a total of 100 boys divided into one control and one experimental group of 50 boys each.

Sample variables

The sample of variables consists of the following motor tests: Body lifting lying on the back (BLLB), Body lifting lying on the stomach (BLLS), Distance jumping from place (DJFP), Hand tapping (HTAP) and Foot tapping (FTAP).

Curriculum

The experimental group worked according to a modified curriculum. The number of classes in the experimental group was increased by two DanceSport classes per week, and there was a change in the organization of the classes, methods and forms of the educational work.

The work of the experimental group, as well as the work of the control group, was aimed at adopting the educational material provided by the curriculum. Unlike the control group, the nature of the work of the experimental group is general physical preparation, with emphasis on increasing the factors: balance, flexibility, segmental speed and repetitive strength with the help of specific DanceSport figures.

The work of the control group, as well as the work of the experimental group, lasted two months. The classes were carried out according to the curriculum and program with a focus on general physical prepration, with a different method of work, in which an empirical dosing of exercise load was introduced. The work of the control group was not directly focused on the development of certain bio motor abilities, as it was with the experimental group. The intensity of the load did not increase as in the experimental group.

Processing method

The data were processed by computer and the following were calculated for each variable:

- Arithmetic mean
- Standard deviation
- Standard error
- Minimum and maximum limit
- Skewness and Kurtosis
- T test
- Multivariate and univariate analysis of variance.

Basic descriptive statistical parameters of the variables of motor skills in the initial and final measurements in the control and experimental groups with 12 to 13 year aged boys

This research covered motor variables that condition successful movement and its improvement, regardless of whether those abilities are innate or acquired during life, and above all through physical activity. The set of tests primarily satisfies the needs arising from the subject, purpose and tasks of the research. For all applied variables in the research, in the initial and final measurement in the control and experimental groups, the basic descriptive statistical parameters were calculated: arithmetic mean (X), standard deviation (SD), the lower and upper limit of the range in which the results move (Min -Max), Skewness – symmetry (Skew), Kurtosis – elongation or flattening of the distribution (Kurt). The results of these analyzes are shown in Tables 1 to 4.

From the review of Tables 1 and 2, the Skewness values for most of the applied variables for assessing motor abilities in the initial and final measurement among the respondents from the control group are within the limits of the recommended values (from -1 to +1), indicating that the distribution of scores is approximately symmetrical.

From the Kurtosis values, most of the variables used to assess motor abilities in the initial and final measurement are within the limits of the recommended values (from -3 to +3) and show flattening (Plastickurtic distribution). A Leptokurtic distribution is observed for the variables: Body lifting lying on the back (BLLB), Body lifting lying on the stomach (BLLS) in the initial measurements and Foot tapping (FTAP) in the final measurements.

The numerical values of the Standard error show minimal dispersion, because proportionally they are insignificant compared to the corresponding value of the Standard deviation. The value of the basic central and dispersion parameters of the applied variables in the intervals of Minimum (Min) Maximum (Max) result, contain two Standard deviations (SD), based on which a satisfactory sensitivity of all variables can be constant.

Table 1. The basic descriptive statistical parameters of the measures for assessing motor abilities in the initial measurement for the control group

Variables	N	Min	Max	Mean	SD	Skewness	Kurtosis
BLLB	50	6,00	50,00	25,780	7,82	-,225	1,79
BLLS	50	2,00	60,00	24,160	10,91	,373	1,27
DJFP	50	140,00	200,00	177,680	12,62	-,531	,381
HTAP	50	20,00	48,00	32,580	7,08	,394	-,567
FTAP	50	20,00	38,00	29,620	4,18	,236	-,033

Table 2. The basic descriptive statistical parameters of the measures for assessing motor abilities in the final measurement for the control group

Variables	N	Min	Max	Mean	SD	Skewness	Kurtosis
BLLB	50	6,00	55,00	30,640	9,81	-,606	,418
BLLS	50	2,00	65,00	31,700	12,03	,276	,813
DJFP	50	155,00	210,00	181,920	13,35	-,007	-,394
HTAP	50	28,00	50,00	36,940	5,07	,464	-,054
FTAP	50	29,00	41,00	34,620	3,75	,131	-1,322

From the review of Tables 3 and 4, the Skewness values of most of the applied variables for assessing motor abilities in both the initial and final measurements among the respondents of the experimental group are within the limits of the recommended values (from -1 to +1), indicating that the distribution of scores is approximately symmetrical. Positive asymmetry or Epicurticity is observed in the variable Hand tapping (HTAP) in the initial measurement.

From the Kurtosis values, most of the variables used to assess motor skills in both the initial and final measurements are within the limits of the recommended values (from -3 to +3) and show flattening (Plastickurtic distribution).

Table 3. The basic descriptive statistical parameters of the measures for assessing the motor abilities in the initial measurement for the experimental group

Variables	N	Min	Max	Mean	SD	Skewness	Kurtosis
BLLB	50	5,00	50,00	29,080	10,14	-,016	-,119
BLLS	50	10,00	60,00	31,200	11,75	,339	,084
DJFP	50	140,00	199,00	177,940	13,59	-,901	,226
HTAP	50	24,00	46,00	32,340	6,12	1,178	-,325
FTAP	50	24,00	40,00	31,560	4,75	,629	-,459

Table 4. The basic descriptive statistical parameters of the measures for assessing motor abilities in the final measurement for the experimental group

Variables	N	Min	Max	Mean	SD	Skewness	Kurtosis
BLLB	50	5,00	55,00	35,100	11,59	-,328	-,298
BLLS	50	12,00	65,00	33,720	12,74	,425	-,028
DJFP	50	155,00	210,00	185,440	13,53	-,223	-,643
HTAP	50	30,00	50,00	38,860	5,42	,542	-,808
FTAP	50	30,00	45,00	35,960	4,87	,610	-,852

The numerical values of the Standard error show minimal dispersion, because proportionally they are insignificant compared to the corresponding value of the Standard deviation. The value of the basic central

and dispersion parameters of the applied variables in the intervals of Minimum (Min) Maximum (Max) result, contain two Standard deviations (SD), based on which a satisfactory sensitivity of all variables can be constant.

Multivariate and univariate analysis of variance in both groups for the initial measurement

To determine whether the groups are homogeneous, an analysis of variance was applied in the initial measurement. The analysis of variance in the initial measurement of the measures for assessing motor skills for the control and experimental group are shown in Table 5.

Table 5. Significance of the differences in motor abilities between the control and experimental group in the initial measurement

	Value	F	Hypothesis df	Error df	Sig.	η2
Pillai's trace	.238	5,863	5,000	94,000	,000	.238
Wilks' lambda	.762	5.863	5,000	94,000	,000	.238
Hotelling's trace	.312	5.863	5,000	94,000	,000	.238
Roy's largest root	.312	5.863	5,000	94,000	,000	.238

Variables	Control group		Experimental group		F	Sig.	η2
	Mean	SD	Mean	SD			
BLLB	25.780	7.83	29.080	10.14	3,321	.071	.033
BLLS	24.160	10.91	31.200	11.75	9.632	.002	.089
DJFP	177.680	12.62	177.940	13.59	.010	.921	.000
HTAP	32.580	7.08	32.340	6.12	.033	.856	.000
FTAP	29.620	4.18	31.560	4.75	4.690	.033	.046

In the initial measurement of the motor tests, the respondents from the control and experimental group did not statistically differ at the multivariate and univariate level.

This situation indicates that the two groups of respondents are relatively homogenized, thus creating conditions for starting the training program from equal positions for the respondents from both groups, and to neutralize the differences and not lead to "systematic error". The groups will be further homogenized with an appropriate statistical procedure. To determine the differences in the final measurement between the control and experimental group, the multivariate and univariate analysis of covariance will be applied.

Post hoc (LSD – least significant difference test) tests were also applied to determine which group of respondents have statistically significant differences in each individual motor ability. The analysis of the tests is shown in Table 6.

Table 6. LSD Post hoc tests

Dependent Variable		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
BLLB	CG	-3.300	1.811	.071	-6.894	.294
	EG	3.300	1.811		-.294	6.894
BLLS	CG	-7.040	2.268	.002	-11.542	-2.538
	EG	7.040	2.268		2.538	11.542
DJFP	CG	-.260	2.623	.921	-5.465	4.945
	EG	.260	2.623		-4.945	5.465
HTAP	CG	.240	1.323	.856	.-2.386	2.866
	EG	-.240	1.323		-2.866	2.386
FTAP	CG	-1.940	.896	.033	-3.718	-.162
	EG	1.940	.896		.162	3.718

From the values of the arithmetic means and the level of statistical significance of the Post hoc test (Table 6), the test respondents from the experimental group are better than the test respondents from the control group in the variables Body lifting lying on the back (BLLB), Body lifting lying on the stomach (BLLS) and Foot tapping (FTAP). Among the respondents from the control and experimental groups, no

statistically significant results were determined in the variables Distance jumping from place (DJFP) and Hand tapping (HTAP).

Multivariate and univariate analysis of variance for the two groups in the final measurement

Multivariate and univariate analysis of covariance was used to determine if there are statistically significant differences in the measures for assessing motor skills in the final measurement in the control and experimental group. The results of the multivariate and univariate analysis of covariance are shown in Table 7. By applying the multivariate analysis of covariance (MANOVA), by testing the significance of the differences of the arithmetic mean in the measures for assessing the motor skills in the final measurement for the two groups, no statistically significant difference was determined at the Q = .00 level.

Table 7. Significance of differences in motor skills between the control and experimental group in the final measurement

	Value	F	Hypothesis df	Error df	Sig.	η2
Pillai's trace	.352	9.676	5,000	89,000	,000	.352
Wilks' lambda	.648	9.676	5,000	89,000	,000	.352
Hotelling's trace	.544	9.676	5,000	89,000	,000	.352
Roy's largest root	.544	9.676	5,000	89,000	,000	.352

Variables	Control group		Experimental group		F	Sig.	η2
	Mean	SD	Mean	SD			
BLLB	30.640	9.81	35.100	11.59	1.240	.268	.013
BLLS	31.700	12.03	33.720	12.74	30.551	.000	.247
DJFP	181.920	13.35	185.440	13.53	3.687	.058	.038
HTAP	36.940	5.07	38.860	5.42	.927	.338	.010
FTAP	34.620	3.75	35.960	4.87	.691	.408	.007

Post hoc (LSD – least significant difference test) tests were also applied to determine which group of respondents have statistically significant differences in each individual motor ability. The analysis of the tests is shown in Table 8.

Table 8. LSD Post hoc tests

Dependent Variable		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for	
					Lower Bound	Upper Bound
BLLB	CG	-.747	.670	.268	-2.078	.585
	EG	.747	.670	.268	-.585	2.078
BLLS	CG	6.686	1.210	.000	4.284	9.088
	EG	-6.686	1.210	.000	-9.088	-4.284
DJFP	CG	-2.542	1.324	.058	-5.172	.087
	EG	.2.542	1.324	.058	-.087	5.172
HTAP	CG	-.682	.708	.338	.-2.087	.724
	EG	.682	.708	.338	-.724	2.087
FTAP	CG	.546	.657	.408	-.759	1.851
	EG	-.546	.657	.408	-1.851	.759

From the values of the arithmetic means and the level of statistical significance of the Post hoc test (Table 8), the test respondents from the control group are better than the test respondents from the experimental group in the variable Body lifting lying on the back (BLLB). The test respondents from the experimental group are better than the test respondents from the control group in the variable Distance jumping from place (DJFP). No statistically significant results were determined between the test respondents from the control and experimental group in the variables Body lifting lying on the stomach (BLLS), Hand tapping (HTAP) and Foot tapping (FTAP).

Significance of the differences between the arithmetic means from the initial and final measurements among the respondents from the control and experimental group

To define the differences in the measures for assessing motor skills between the initial and final measurement for the control group, T-tests for small dependent samples were applied. The results are shown in Table 9.

Table 9. Significance of the differences of the arithmetic averages from the initial and final measurement of the respondents from the control group

Variables	Initial		Final		T-test	Sig.
	Mean	SD	Mean	SD		
BLLB	25.780	7.82	30.640	9.81	-9.092	.000
BLLS	24.160	10.91	31.700	12.03	-6.430	.000
DJFP	177.680	12.62	181.920	13.35	-5.490	.000
HTAP	32.580	7.08	36.940	5.07	-7.604	.000
FTAP	29.620	4.18	34.620	3.75	-8.861	.000

From Table 9, between the initial and final measurement, statistically significant differences were determined in all variables.

To define the differences in the measures for assessing motor skills between the initial and final measurement for the experimental group, T-tests for small dependent samples were applied. The results are shown in Table 10.

Table 10. Significance of the differences of the arithmetic averages from the initial and final measurement of the respondents from the experimental group

Variables	Initial		Final		T-test	Sig.
	Mean	SD	Mean	SD		
BLLB	29.080	10.13	35.100	11.59	-10.690	.000
BLLS	31.200	11.75	33.720	12.74	-5.457	.000
DJFP	177.940	13.59	185.440	13.53	-8.255	.000
HTAP	32.340	6.11	38.860	5.42	-10.381	.000
FTAP	31.560	4.75	35.960	4.87	-9.372	.000

From Table 10, between the initial and final measurement, statistically significant differences were determined in all variables.

Conclusion

The obtained results confirm the beneficial impact of increased exercise volume, varied content and increased exercise intensity. All this has a positive effect on the transformation processes of other personality traits and therefore they deserve even greater support. This research provided useful information about the impact of the additional two DanceSport classes on the motor dimensions of girls who, in addition to three hours, had five hours a week.

Although this research provided useful indicators for the practice, it also had its drawbacks. The research used an experiment lasting two months, which indicates that the research had a transversal character. We believe that in further research of this and similar nature, it is necessary to increase the sample of variables for motor skills and based on the obtained results to make an analysis and obtain a more precise and accurate level of the existing condition. It is also necessary that the number of examined girls be greater, as with the statistical indicators, more accurate relationships would be obtained by means of the multivariate and univariate analysis of variance.

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