

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

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Vlatko Pavleski, Zaklina Kovacevic Bozilova

¹Ss. 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 $n = 80$ respondents divided in two groups (control and experimental one) of 40 girls aged 12 to 13 years old. Balance assessment, flexibility, and segmentary speed tests have been applied (one leg balance with closed eyes, a deep bend on a bench, number of squats in 30 seconds 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 female 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 girls aged 12-13. It consists of a total of 80 girls divided into one control and one experimental group of 40 girls each.

Sample variables

The sample of variables consists of the following motor tests: Balance on one leg with eyes closed (BLEC), Deep bend on a bench (DBB), Squatting 30 sec. (S30), 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 preparation, 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 girls

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. Positive asymmetry or Epicurticity is observed only in the Hand tapping variable (HTAP) in the initial and final measurement.

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: Hand tapping (HTAP) and Foot tapping (FTAP) in the initial and final measurements and for the variables Balance on one leg with eyes closed (BLEC) and Squatting 30 sec. (S30) in the final measurement.

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
BLEC	40	11,00	60,00	32.650	14.94	,282	-1,02
DBB	40	15,00	59,00	35.600	8.84	,549	1,43
S30	40	12,00	32,00	23.900	5.77	-,162	-,975
HTAP	40	20,00	48,00	29.850	5.11	1.098	3.110
FTAP	40	20,00	39,00	29,600	3.5	,421	2.212

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
BLEC	40	17,00	60,00	40.550	14.15	.057	-1.308
DBB	40	30,00	60,00	45.925	8.66	-,250	-,697
S30	40	20,00	33,00	27.725	3.99	-,498	-1.149
HTAP	40	28,00	47,00	34.850	4.28	1.059	1.450
FTAP	40	26,00	40,00	34,125	3,95	-,079	-1,017

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 variables Hand tapping (HTAP) and Foot tapping (FTAP) 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). A Leptokurtic distribution is observed for the variables Balance on one leg with eyes closed (BLEC) and Hand tapping (HTAP) in the initial and final measurements and for Squatting 30 sec. (S30) in the final measurement.

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 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
BLEC	40	15,00	60,00	37.950	14.92	,104	-1.287
DBB	40	25,00	59,00	41.450	7.57	,524	,818
S30	40	15,00	30,00	23.275	4.13	-,024	-,814
HTAP	40	24,00	48,00	32,225	6,58	1,454	1.200
FTAP	40	24,00	39,00	29.350	3.99	1.018	.729

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
BLEC	40	25,00	60,00	47.700	12.89	-,489	-1,275
DBB	40	39,00	70,00	53.050	8.18	,250	-,463
S30	40	22,00	35,00	28.500	4.08	-,205	-1,294
HTAP	40	30,00	49,00	38.450	5,24	,565	-,478
FTAP	40	30,00	40,00	34.375	3.65	,362	-1,225

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.	η ²
Pillai's trace	.286	5,942	5,000	74,000	,000	.286
Wilks' lambda	.714	5,942	5,000	74,000	,000	.286
Hotelling's trace	.401	5,942	5,000	74,000	,000	.286
Roy's largest root	.401	5,942	5,000	74,000	,000	.286

Variables	Control group		Experimental group		F	Sig.	η ²
	Mean	SD	Mean	SD			
BLEC	32.650	14.94	37.950	14.92	2.520	.116	.031
DBB	35.600	8.84	41.450	7.57	10.101	.002	.115
S30	23.900	5.77	23.275	4.13	.310	.579	.004
HTAP	29.850	5.11	32.225	6.58	3.247	.075	.040
FTAP	29.600	3.56	29.350	3.99	.087	.768	.001

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
BLEC	CG	-5.300	3.339	.116	-11.947	1.347
	EG	5.300	3.339		-1.347	11.947
DBB	CG	-5.850	1.841	.002	-9.515	-2.185
	EG	5.850	1.841		2.185	9.515
S30	CG	.625	1.122	.579	-1.610	2.860
	EG	-.625	1.122		-2.860	1.610
HTAP	CG	-2.375	1.318	.075	-.4.999	.249
	EG	2.375	1.318		-.249	4.999
FTAP	CG	.250	.846	.768	-1.434	1.934
	EG	-.250	.846		-1.934	1.434

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 Balance on one leg with closed eyes (BLEC), Deep bend on a bench (DBB) and Hand tapping (HTAP). Among the respondents from the control and experimental groups, no statistically significant results were determined in the variables Squatting 30 sec. (S30) and Foot tapping (FTAP).

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.	η^2
Pillai's trace	.212	3.711	5,000	69,000	.000	.212
Wilks' lambda	.788	3.711	5,000	69,000	.000	.212
Hotelling's trace	.269	3.711	5,000	69,000	.000	.212
Roy's largest root	.269	3.711	5,000	69,000	.000	.212

Variables	Control group		Experimental group		F	Sig.	η^2
	Mean	SD	Mean	SD			
BLEC	40.550	14.15	47.700	12.89	2.927	.091	.039
DBB	45.925	8.66	53.050	8.18	7.472	.008	.093
S30	27.725	3.99	28.500	4.09	2.988	.088	.039
HTAP	34.850	4.28	38.450	5.24	6.216	.015	.078
FTAP	34.125	3.94	34.375	3.65	.025	.875	.000

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
BLEC	CG	-3.248	1.899	.091	-7.033	.536
	EG	3.248	1.899	.091	-.536	7.033
DBB	CG	-3.861	1.413	.008	-6.676	-1.046
	EG	3.861	1.413	.008	1.046	6.676
S30	CG	-1.065	.616	.088	-2.293	.163
	EG	1.065	.616	.088	-.163	2.293
HTAP	CG	-.1528	.613	.015	-.2749	-.307
	EG	1528	.613	.015	.307	2.749
FTAP	CG	-.130	.826	.875	-1.777	1.517
	EG	.130	.826	.4875	-1.517	1.777

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 experimental group are better than the test respondents from the control group in the variable Balance on one leg with closed eyes (BLEC), Deep bend on a bench (DBB), Squatting 30 sec. (S30) and Hand tapping (HTAP). No statistically significant results were determined between the test respondents from the control and experimental group in the variable 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		
BLEC	32.650	14.94	40.550	14.15	-4.874	.000
DBB	35.600	8.84	45.925	8.66	-10.598	.000
S30	23.900	5.77	27.725	3.99	-7.575	.000
HTAP	29.850	5.11	34.850	4.28	-11.557	.000
FTAP	29.600	3.56	34.125	3.95	-7.236	.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		
BLEC	37.950	14.92	47.700	12.89	-9.808	.000
DBB	41.450	7.57	53.050	8.18	-14.506	.000
S30	23.275	4.13	28.500	4.09	-13.820	.000
HTAP	32.225	6.58	38.450	5.24	-11.762	.000
FTAP	29.350	3.99	34.375	3.65	-9.628	.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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