Innovative Teaching Models in the System of University Education: Opportunities... pp. 147–163

Sandra Milanović and Ivana Milić
University of Kragujevac, Faculty of Education
Jagodina, Serbia

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UNIVERSITY TEACHING THROUGH THE EFFECTS OF CELLULAR WORK APPLICATION AND ADDITIONAL EXERCISE WITH MUSIC AS THE METHODICAL AND ORGANIZATIONAL FORM OF WORK

Abstract: The holistic development of students at schools largely depends on properly directed learning process, for which the students, future teachers, are getting prepared during their university education, thus being able to acquire teaching competence and develop their pedagogical skills as well. Nowadays, students are faced with a series of demands arising from the development of technology and scientific advances, but in order to successfully meet their requirements, the application of innovative teaching models is essential.

The aim of this paper is to show the effects of methodological and organizational forms of work in teaching with the integration of different methodological content. The sample was made up of primary school students (n = 120), aged 12 to 13 from the Jagodina region, divided into two sub-samples where the first group consisted of 60 subjects, who were included in the experimental program of the cell forms of methodical work and the additional exercises accompanied with the selected music compositions (Experimental group) and the second group consisting of 60 subjects, who were engaged in the regular program of physical education (Control group). Through the application of test subjects, the following motor skills were monitored: coordination, explosive force, repetitive force, sprint and segment speed, as well as the following functional capacities: vital lung capacity, anaerobic power and pulse frequency after the load. For the purpose of determining the differences between the motor and the functional capacities of the children, in addition to the basic statistical parameters to define the global quantitative differences in the motor and functional area, multivariate and univariate analysis of variance and co-variance as well as factor analysis are applied. The results show that statistically significant differences do exist in the motor and the functional space of children as well as the existence of latent dimensions of the defined space.

Keywords: pupils, motor skills, functional abilities, integration, musical arts, university teaching.

INTRODUCTION

The cellular forms of work and additional exercises as methodological and organizational forms of work are applicable in almost all the material conditions and age categories. They represent the methods of organizing the process of training and achieving objectives of physical education that will through the integration with music provide a more powerful effect. Releasing an excessive subject differentiation by linking content opens the way for integration of knowledge and increases the performance of university teaching. In addition to the existing models, methods, and forms in teaching, it is necessary to include an innovative teaching since the integrative teaching is the one that enables connection of the specific teaching content of different subjects, erasing their boundaries and forming structural and meaningful connections. The actual goal is to avoid stereotypes in teaching physical and music education, but also to eliminate as many factors that negatively affect the development of elements of physical and musical abilities among the school age children. Through university education it is necessary to train students for the application of innovation, and they will later, through their efforts, applying the acquired knowledge and professionally customizing content for the connection of physical and music education, contribute to the modernization of teaching at schools.

Although the frontal teaching, as the traditional model, still exists, it should not be turned into a passive process of acquiring knowledge and skills. Applying integration model to the teaching programs, teaching teams, pupils/students with disabilities, educational institution and nature, represents the future of university teaching and the method of improving its quality and competitiveness.

Research shows that the use of methodical form of cellular work and the additional exercises with music enables achieving great effective time during exercise with high work intensity, thus significantly increasing the energy and informational component of the exercise, necessary for the students' anthropological area dimension transformation and motor skills acquisition (Findak, 1992). In the aspect of music, the survey shows that music contributes to increasing ergogenic effects, i. e. capacity for physical or mental work (Karageorghis et al, 2009), provides a psychological stimulus and improves positive feelings. Although the role of music is motivational, it certainly contributes to relaxation and efficacy in long-term sports activities. Karageorghis, Terry and Lane (1999) developed a conceptual approach, known as Brunel Music Rating Inventory (BMRI), that was supposed to call for the effects of motivational music and similar measures for checking motivational qualities of music. According to them, the main features of motivational music are fast tempo and powerful rhythm that supports the energy and activity of the body (Karageorghis et al, 1999). The primary factors that

influence music to cause a reaction in exercise and sports activities are the rhythm, melody and harmony whereas the secondary factors include cultural impact and associations that a piece of music may evoke (Terry et al, 2012).

Studies of the effects of the organizational work forms in regular physical education demonstrated that applying methodological organizational forms of cellular work and additional exercises (adequate selection of the operator, the method, the extent and intensity of load) achieves the significant positive adaptive processes of the anthropological characteristics of school children (Malacko and Radjo, 2004; Przulj, 2006; Visnjic, 2006).

Previous studies gathered sufficient information that are relevant for studying the results of this research. Brankovic, Zivkovic and Kocic (2012) in a sample of primary school students, aged 11 ± 6 months, conducted a study to determine the effects of the application of cellular methods of work on the development of (repetitive and explosive) dynamic force in students. The sample was divided into two subgroups: sub-sample of the experimental group and control group sub-sample. Experimental group applied the cellular work during 24 hours of physical education in the main phase of the class while the control group respondents implemented the standard program suggested by physical education curriculum. The results show statistically significant differences in multivariate level in all the monitored variables of the dynamic force (repetitive and explosive strength), in the final compared to the initial state, at the level of significance (Q =.00). The univariate analysis showed a statistically significant difference in all the variables of the dynamic force, at the level of significance Q=.00. Based on these results, it can be concluded that the use of cellular methods in physical education caused significant adaptive changes of the explosive and repetitive force in the experimental group (a) whereas the standard program caused statistically significant adaptive changes only in the variables of the explosive force.

Markovic, Milanovic, Bogdanovic (2010) conducted a research in the first half of the school year 2009/2010, on a sample of 79 fifth grade primary school students. The sample of variables consisted of five anthropometric characteristics. The aim of this study was to determine the possible differences among them, caused by applying different methodical forms of work in the main part of the physical education class. The first experimental group applied circular work, the second experimental group worked with the application of the additional exercises, and the control group did classical form of a class, applying work in columns. Using descriptive statistics, final measurement showed differences in the anthropometric characteristics among the three groups of students. Multivariate analysis of the variance showed no statistically significant differences among the groups during the initial and final measuring. Analysis of variance revealed a statistically significant difference among the groups only for the body height. T-test

at the final measurement also showed the difference between the first and second experimental and control group related to the body height. The results obtained indicate that the effects of the applied work forms during the main part of the physical education class did not cause significant changes in the search area of the anthropometric characteristics.

The subject of the research is the study of the experimental models of cellular methodical forms of work and the additional motor and functional exercises with music in elementary school students, aged 12 and 13 during regular classes. The research problem is whether the equipment, methods and load used in the process of applying the methodical forms of work as well as the additional exercises while listening to music can affect a statistically significant development of motor and functional capacities of the experimental group. The age of subjects is a middle school age (12-13 years), which is characterized by the intense psychosomatic changes, accompanied by numerous anatomical-physiological and psychological changes, so we assumed that music can accelerate the intrinsic motivation, focus attention, improve concentration and be an incentive for applying innovative forms of work. Bearing in mind biological condition of these individuals, an additional problem can be defined as a structural analysis of these parameters, that is, a latent dimensionality of the defined space.

The main objective of the research is to determine the level of difference in motor and functional space of children. Since the pattern of the defined population is located in the intensive phase of the growth and development, the specific aim is to establish the latent dimensionality that characterizes this population on the basis of the manifest variables, both in the motor and in the functional capabilities area. Research tasks are defined as follows: to determine statistically significant differences in the motor and the functional space and to determine the level of the latent dimensionality of the space defined in the experimental group.

METHODS

Multivariate and univariate analysis of variance and covariance are used for the needs of this study in order to determine the effects of practicing cellular methodical forms of work with the additional exercises to music on the development of motor and functional abilities in the final measurement, in the experimental group, and the effects of the application of standard teaching programs in the control group. The analysis of intergroup differences in two studied areas (motor and functional capability) was calculated, as well as the existence of the latent dimensi ons.

The sample consisted of 120 subjects, primary school students, aged 12 and 13, in the region of Jagodina. The sample was divided into two groups: the first group consisted of 60, covered with the experimental program of the cellular methods of work and the additional exercises to music (Experimental group), and the second group had 60 examinees that were included in the standard teaching program (Control group).

The sample of variables and the instruments for measuring motor skills

Motor skills are made of these dimensions:

(1) Coordination

1. Agility in the air OKVZ
2. Coordination with a bat KOPL
3. Agility the ground OKNT

Music piece that accompanied the measuring was „Song of the Turtledove" from the first Serbian ballet „The Legend of Ohrid" by Stevan Hristic.

(2) Explosive force

4. Standing long jump SKDM
5. Standing triple jump MTRS
6. Throwing a medicine ball from a standing position MBMS

Music that followed the measurement was „Balkan Dance No. 2" by Marko Tajcevic.

(3) Repetitive force

7. The lift of the hull in the Swedish bench MDTK
8. Mixed pull-ups MMZG
9. Squats MČUČ

Music that accompanied the measurement was „Small Pepper", medieval Scomrash dance performed by the ensemble „Renaissance".

(4) Sprint speed

10. Running 20m with standing start M20VS
11. Running 40m with standing start M40VS
12. Running 60m with standing start M60VS

Music that accompanied the measurement was the „Kolo", performed by Ljubisa Pavkovic on the accordion.

(5) Segment speed:

13. Hand taping MTAPR
14. Foot tapping MTAPN
15. Tapping off the wall MTAPZ

Music that followed the measurement was „Rhapsody of Senjak" by Vera Milanković, performed by ensemble „Arte".

Instruments (physical education) for measuring motor skills were based on the researches of Kurelic and the associates in 1975.

Measuring instruments for the evaluation of the functional capabilities

The functional capabilities consist of these tests:

1. Vital lung capacity FVKPL
2. Anaerobic power – „Margarija" test FMARG
3. Pulse frequency after the load FPPOP

Functional tests in this study were obtained from the model of the functional tests (Gajic, 1985).

RESEARCH RESULTS WITH THE DISCUSSION

Differences between the experimental and control group at the initial testing

Table 1. Multivariate analysis of motor skills variance in the experimental and control group at the initial measuring

WILK'S LAMBDA TEST	**.667**
RAO's F-approximation	**1.35**
Q	**.155**

The analysis of Table 1 presenting the results of testing the significance of the differences between the arithmetic means of all the motor tests, the initial sample measurements of the experimental and control group, did not show statistically significant difference since WILK'S LAMBDA was .667, which gives a significant difference in the level of Q = .155 with Ra's F-approximation of 1.35. Accordingly, the applied system of motor skills of participants showed no statistically significant differences.

Table 2.Univariate analysis of motor skills variance between the experimental and the control group at the initial testing

Motor tests	**Mean (E)**	**Mean (K)**	**F-proportion**	**Q**
MOKVZ	15.34	15.90	1.24	.244
MKOPL	5.46	6.02	1.52	.155
MOKNT	6.61	7.74	1.35	.265
MSKDM	155.20	160.00	0.44	.425
MTRSK	446.62	425.26	1.62	.168
MBMDC	3828.35	379.56	1.55	.285
MDTŠK	10.45	11.05	1.26	.247
MMZGB	13.54	14.15	1.32	.150
MČUČN	16.75	17.37	0.42	.458
M20VS	4.65	4.52	1.84	.122
M40VS	7.84	8.00	1.82	.122
M60VS	10.45	11.28	0.74	.354
MTAPR	23.24	24.00	1.42	.135
MTAPN	32.22	32.00	1.56	.260
MTAPZ	20.68	21.10	1.57	.257

Table 2 shows the analysis of motor skills variance test by comparing the results of the arithmetic means of the experimental and control group at the initial measurement. Based on the coefficients of the F-proportion and their significance (P-Level), we can conclude that no significant difference was found on the level of motor skills between the experimental and control group.

Table 3. Multivariate analysis of variance between the functional capacities of the experimental and the control group at the initial testing

WILK'S LAMBDA TEST	.744
RAO's F-approximation	1.58
Q	.102

The analysis of Table 3 shows the results of testing significance of the differences in the arithmetic mean level of all the functional capabilities tests. No statistically significant difference among the initial sample measurements in the

experimental and control groups was found since WILK'S LAMBDA is .744, and with Ra's F-approximation of 1:58 it gives a significant difference at the level of Q=.102. Accordingly, the applied system of the functional abilities of the subjects showed no statistically significant differences.

Table 4. The univariate analysis of the functional capacity variance between the experimental and the control group at the initial testing.

Functional capacity tests	**Mean (E)**	**Mean (K)**	**F-proportion**	**Q**
FVKPL	2770.00	2690.00	1.55	.198
FMARG	3.86	3.79	1.34	.155
FPPOP	159.50	160.00	1.58	.179

Table 4 shows the univariate analysis of the functional capacities test variance, comparing results of the arithmetic means in the experimental and control groups at the initial measurement. Based on the coefficients of F-relationships and their significance (P-Level), we can conclude that there were no significant differences in the levels of functional capabilities between the experimental and control groups.

The effects of the experimental program

Table 5. Multivariate analysis of covariance of motor skills between the experimental and control groups at the final measuring

Wilks' Lambda	**Rao's R**	**Q**
.314	4.95	**.000**

The analysis of Table 5 presenting the results of testing the significance of the differences in the arithmetic means levels of all the motor tests between sample measurements of the final experimental and control groups, showed statistically significant differences since WILK'S LAMBDA is .314, which gives a significant difference on the level of Q = .000 by Ra's F-approximation of 4.95. Accordingly, the applied system of motor skills showed statistically significant differences.

Table 6. Univariate analysis of covariance of motor skills between the experimental and control groups at the final measuring

Motor tests	Means (E)	Means (K)	F-proportion	Q
MOKVZ	12.35	15.20	4.77	**.000**
MKOPL	3.70	5.80	5.74	**.000**
MOKNT	4.48	6.35	8.55	**.000**
MSKDM	182.40	164.10	14.68	**.000**
MTRSK	495.60	435.42	5.85	**.000**
MBMS	462.55	389.56	15.47	**.000**
MDTŠK	15.10	12.25	12.64	**.000**
MMZGB	18.65	15.60	12.27	**.000**
MČUČN	22.25	18.73	11.95	**.000**
M20VS	3.65	4.37	7.12	**.000**
M40VS	6.24	7.83	19.32	**.000**
M60VS	9.20	10.76	12.65	**.000**
MTAPR	29.95	25.00	6.23	**.000**
MTAPN	37.38	33.00	14.12	**.000**
MTAPZ	26.56	23.00	5.02	**.000**

Table 6 represents the univariate analysis of the motor skills test variance by comparing the results of the arithmetic means between the experimental and control group at the final measuring. On the basis of the F-proportion coefficients and their significance (P-Level), we can conclude that there was a statistically significant difference on the level of motor skills between the experimental and control groups for the following motor tests: in the air (MOKVZ, 000), co-ordination with a rod (MKOPL .000), agility on the ground (MOKNT, 000) accompanied with „Song of the Turtledove" from the ballet „The Legend of Ohrid" by Hristic, standing long jump (MSKDM, 000), standing triple jump (MTRSK, 000), throwing a medicine ball from a standing position (MBMS .000) accompanied with „Balkan Dance No. 2" by Tajcevic, lifting the trunk in the Swedish bench (MDTŠK, 000), mixed pull-ups (MMZGB, 000) and squats (MČUČN, 000) accompanied with the Scomrash dance „Small Pepper", running 20 meters with standing start (M20VS, 000), running 40 meters with standing start (M40VS, 000), running 60 meters with standing start (M60VS, 000) accompanied with „Kolo" by Pavkovic, hand tapping (MTAPR, 000), foot tapping (MTAPN, 000), and tapping against

the wall (MTAPZ .000) performed along with „Rhapsody of Senjak" by Vera Milanković.

Table 7. Multivariate analysis of the functional capacity covariance between the experimental and control groups at the final measuring

Wilks' Lambda	**Rao's R**	**Q**
.199	10.25	**.000**

The analysis of the Table 7 presenting the results of testing the level of significance of the arithmetic means' differences of all the tests related to the functional capacities of the final measurements between the experimental and control groups, showed statistically significant differences, as WILK'S LAMBDA is .199, and with Ra's F-approximation of 10.25, it gives the significate difference at the level of Q = .000. Accordingly, the applied system of the functional abilities of subjects showed statistically significant differences.

Table 8. Univariate analysis of the functional capacities covariance between the experimental and control groups at the final measuring

Func.tests	**Means (E)**	**Means (K)**	**F-proportion**	**Q**
FVKPL	2940.47	2740.00	7.44	**.000**
FMARG	3.26	3.67	3.85	**.010**
FPPOP	14910	158.10	9.19	**.000**

Table 8 shows the analysis of the functional capacity tests variance comparing the results of the arithmetic means between the experimental and control group at the final measuring. On the basis of the F-proportion coefficients and their significance (P-Level), we could conclude that there was a statistically significant difference among the levels of the functional capabilities between the experimental and control groups in all the tests: vital breathing capacity (FVKPL .000), Margarija test (FMARG .010) and pulse frequency after the load (FPPOP .000).

The results of the multivariate and univariate analysis of variance indicate that the Experimental group examinees significantly discerned from the Control group by higher level of motor and functional abilities.

Factor analysis and the factor structure of motor skills at the final measuring in the experimental group

Table 9. The matrix of the main components

Motor tests	FAC1	FAC2	FAC3	h2
MOKVZ	.56	**.83**	.33	.70
MKOPL	.41	**.85**	.25	.79
MOKNT	.38	**.74**	.37	75
MSKDM	**.76**	.26	-.15	.71
MTRSK	**.78**	.35	.01	.72
MBMDC	**.**34	.41	.10	.88
MDTŠK	.33	-.40	**-.76**	.74
MMZGB	.31	-.32	**.84**	.86
MČUČN	.26	-.27	**.73**	.72
M20VS	**.86**	-.29	-.15	.81
M40VS	**.82**	.21	-.01	.78
M60VS	**.79**	.13	-.12	.58
MTAPR	**.71**	.15	.05	.72
MTAPN	**.68**	.24	.17	.80
MTAPZ	.56	.36	.15	.70

Table 10. Eigenv.extraction

	Eigenval	% total Variance	Cumul. Eigenval	Cumul. % Variance
1	4.65	45.10	4.65	45.10
2	3.30	19.20	7.95	64.30
3	2.42	10.57	10.37	**74.87**

Table 11. Factor intercorelation matrix

	FAC1	FAC2	FAC3
FAC1	1.00		
FAC2	**.35**	1.00	
FAC3	-.25	**.30**	1.00

In the factor analysis of motor skills in the experimental group, we used a procedure called Gutman-Kajzer's normalization. A collection of 15 manifesting motor variables in the experimental group was explained with 70.87% of the total system variance, wherein three factors determining the total system variance were identified. On the basis of the values obtained within the entire motor space, it can be concluded that in the experimental group the first factor (latent variable) is the result of sprint speed, explosive force and segment speed variables. Common variance of the first factor accounts for more than 45% of total system variance, as confirmed by the high value of eigen. vector (4.65). As for the saturation of the first factor, sprint speed variables made the largest contribution: (.86 M20VS), running 40m standing start (.82 M40VS) and running 60m standing start (.79 M60VS). The participation of these variables justifies the value of the communalities in the range from (com. =. 71) to (com. =. 88). Regarding the extraction of the first factor, the variables for assessing the explosive force of the limbs demonstrated their influence and contribution: triple jump (MTRSK .78), long jump (MSKDM .76), with high projections of communalities confirming their relationship in a defined system. In addition to these two groups of variables, the variances of the segment speed, hand tapping, foot tapping also participated in the mutual system variable, with high and significant projections (MTAPR .71) and (MTAN .68). The values of communalities in space are high as well. The fact confirming that the first factor in the experimental group is the main carrier of the common variability is based on the analysis of the matrix structure and the assembly matrix, as well as the proof that the first primary component passes through the thickest sheaf of manifest variable vectors explaining the largest part of the total system variance. Accordingly, this factor can be interpreted as a latent dimension of speed and explosiveness of movement.

The second latent dimension was defined by the participation and extraction of body coordination variables, which enabled self-extraction with their ratios size and the position in the coordination system. The main carrier of the second extracted factor are the variables of coordination, coordination with the bat (.85 KOPAL), agility in the air (.83 MOKVZ), agility on the ground (.74 OKNT). This factor used 19.20% of the total motor system variability in the experimental group, as evidenced by the eigen. value - 3.30. Also, the values of communality in the observed area are in the regular range from .70 to .79. This is interesting because coordination is highly genetically determined by over 80% and is independent in the motor area. This is confirmed by its independent extraction, which is not affected by any motor skill. It is often called the motor intelligence because it is included in the movement structure mechnism, depending on the function of the CNS. Based on these isolated variables, this second latent dimension can be defined as the dimension of *body coordination*.

Lastly, the third extracted factor in rotation is defined by repetitive force variables: lifting the hull on the Swedish bench (.76 MDTSK), mixed pull-ups (.84 MMZGB) as a leading system projection and squats variable (.73 MČUČN). All three variables show values higher than .70 which classifies them as high projections in the entire system, forming a bundle of factors within the monitored area. This factor used 10:57% of the common system variance with the eigen. value of -(2.42) (Table 9). The factor determination values, that is, the values of the communalities are high projections wherein MDTSK (com. =. 74), MMZGB (com. =. 86), squats (com = .72). It can be said that this set is positioned close to the largest number of manifest variables that have its beam passing by. Such position in the coordination system is the behaviour of this factor as a secondary one, which determines the highest amount of common variability of the extracted factors (the latent dimensions) in relation to the first one. Additionally, the values of the structure matrix and the assembly matrix are very high, and confirm the extraction of components. The third extracted factor is described as an excitation duration factor in the area of the second-order, within the energy regulation of movement. It is genetically conditioned with about 50% and is defined as a latent dimension of *the repetitive force.*

By analysis of the manifest variables in motor space of students in the experimental group, 3 different factors were extracted, with different regulatory mechanisms (energy and central regulation), which are likely responsible for the structure of and motor space arrangement. The inspection of the correlation matrix (Table 11.) of the isolated motor factors showed statistically significant correlations related to both levels of significance.

The first factor, latent dimension of speed and movement explosiveness, achieved a medium correlation with other factor of body coordination (.35) and a negative correlation with the repetitive force (-.25). Another latent dimension, the body coordination, has established positive correlation with the third factor (.30). However, these correlation values are low, so we can say that they are conditionally independent of each other.

The factor analysis of the functional capacities of the experimental groups

Table 12.The matrix of the main components

Functional tests	FAC 1	H2
FVKPL	.85	.76
FMARG	.67	.78
FPPO	.70	.71

Table 13. Eigenval.extraction

	Eigenval	% total Variance	Cumul. Eigenval	Cumul. % Variance
1	3.74	17.75	3.74	**18.75**

Table 14. Assembly matrix

Functional tests	**FAC1**
FVKPL	.76
FMARG	.60
FPPO	.67

Table 15. Structure matrix

Functional tests	**FAC1**
FVKPL	.73
FMARG	.54
FPPO	.64

Applying GK criteria, only one of the components was isolated from a relatively small number of variables used for the evaluation of the functional capacities in the experimental group (Table 15). The amount of variability explaining the main component isolated the functional capacities of the experimental group was 17.75 whereby the program of the experimental treatment left a small trace in the differentiation of functional capabilities. The main component extracted with almost 20% of the variance, which is the percent of the total exhaustion of the entire functional variable system, with eigen. values of 3. 74, gives a confirmation of the substantial extraction of the first factor. The main and only defining factors are variables of aerobic endurance, vital lung capacity as a leading projection (.85 FVKPL), pulse frequency after load (.70 FPPO). Also, the variable of anaerobic endurance in Margarija test had a meaningful impact with its projections (.67 FMARG), thus contributing to the definition of the common system variance. The values of the assembly matrix and the matrix of the variable structure analysed, confirmed this extraction. On the basis of the variables defined and the size of their projections in the saturation of the single latent dimension, it can be concluded that there was homogeneity maintained in the aerobic-anaerobic capacity in the context of the functional capacities of the experimental group. This latent dimension is defined as *the aerobic-anaerobic endurance.*

The results obtained in this study about the impact of cellular models of work and the additional exercises to music on the adaptive processes of some anthropological characteristics of secondary school students are of practical importance in the use of collected data for the selection process in sport, training control, diagnostics and modelling. We can also perceive the effects of physical education classes in the integration with music education at schools and suggest ways and guidelines for innovating the teaching process. By searching over a longer period, we could achieve a higher level of generalization of the results and it would be possible to discover new scientific principles. The results will be also used for more efficient keying of the planning process, optimization, rationalization and individualization of work, which will allow a more efficient method for identifying indicators and systematic monitoring as well as controlling the effects of exercising process in the regular physical education and training process.

CONCLUSION

The sample consisted of 120 elementary school students, aged 12 and 13, from the region of Jagodina. The sample was divided into two groups: *the first group* consisted of 60 students included in the experimental program of the cellular methodical forms of work and the additional exercises to music in a regular class (experimental group). *The second group* of 60 subjects was included in the regular program of physical education (control group). Based on the results obtained, we can conclude that there are statistically significant differences in the experimental group, both in motor and functional space of research. After processing the data and the results obtained by applying the factor analysis in the defined research areas (motor and functional), we obtained a small number of latent dimensions on the basis of the actual manifest variables applied in the experimental group. The results of the factor analysis of motor skills in the experimental group showed the existence of a different number of factors (two and three factors) which operate under the second order mechanism, that is, the mechanism of energy and central control of movement. The results of the factor analysis of the functional capabilities in the experimental group confirmed the existence of the common factor, a latent dimension of the functional area. This dimension has unified endurance, but based on its specifics, it relates to the anaerobic and aerobic endurance.

In order to have the evident effects of the application of methodical and organizational forms of work with music in the classroom, and to enable continuous and constant development of each individual by further transfer of knowledge through all levels of education, the training of students must be understood as structurally complex and multidimensional, like the development process, as an

open concept that provides the opportunities for the application of various innovative models. The integration of certain aspects in several scientific disciplines represents the model for solving complex problems occurring in narrowly concentrated fields of different subjects as well as overcoming the limitations of a differentiated approach, achieving inter-connectivity, and exchanging the position of student where he has to become an active participant in all the phases of university education.

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