

MEPDEV 2nd: 2016
Central & Eastern European LUMEN International
Conference - Multidimensional Education & Professional
Development. Ethical Values

TEACHING TECHNOLOGIES FOR ACHIEVEMENT OF
“STRENGTH” LEARNING UNIT AT 8TH GRADE

Vladimir Potop (a)*, Valeriu Jurat (b), Larisa Potop (c)

*Corresponding author

(a) Ecological University of Bucharest, Romania, vladimir_potop@yahoo.com

(b) State University of Physical Education and Sport, Chisinau, Republic of Moldova, valeriujurat@mail.ru

(c) PhD student, State University of Physical Education and Sport, Chisinau, Republic of Moldova,
potop.larisa@yahoo.com

Abstract

This paper focuses on the use of didactic technologies for achievement of “Strength” learning unit by means of circuit method in 8th grade. The following research methods have been used: bibliographic study of the specialized literature study of specialized documents (students’ transcripts of records, medical records), pedagogic observation, experimental study, method of test events, method of circuit, statistical – mathematical method for data processing and interpretation. The “circuit” methodological procedure, formed of 8 individualized exercises for girls and boys, has been used to achieve “Strength” learning unit during Physical Education class. Test events included in the National School System of Evaluation of Physical Education and Sports were applied to check the level of strength development in 8th grade. This study showed that the experimental group managed to have obvious progresses after application of circuit method during the class of physical education, acting both on motor skills development indicators and on harmonious physical development. The large variety of exercises used during the circuit is a contributory factor for development of muscles trophicity and tonicity; thus the body harmonious development is achieved. The interest shown by students to develop strength by working in circuit in different workout stations proved that the circuit method used in physical education class was highly effective, which was also demonstrated by the results obtained after this study.

© 2017 Published by Future Academy www.FutureAcademy.org.UK

Keywords: Circuit, strength, individualization, techniques, means.



1. Introduction

Many concepts (Dragnea, et. al., 2006; Dragomir & Scarlat, 2004; Joița, 1998; Ionescu, et. al., 1995; Ionescu, 2005) are used when approaching the issues of didactic process methodology: instructional methods, techniques, procedures and strategies whose meaning must be clarified. Etymologically, the term of method comes from the Greek words *odos* – way, path and *metha* – to, towards. So, the education method designates the approach to be followed to achieve the educational goals targeted. The term of „technique”, in its methodological sense, defines a specific, particular work, a way to use one method or another, to perform an action. The methods, techniques and procedures selected at one time are subordinated to a specific strategy for conducting the instructional processes.

The specific contribution of Physical Education added to the achievement of key competences fields of the compulsory education in Europe and hence in Romania leads to ”development of bio-psycho-motor skills and formation of students’ ability to act on these ones for maintaining permanently the optimal status of health ...” (Dragomir, & Scarlat, 2004, p.15).

„Component of general education, the physical education aims to improve the harmonious development of the body, to prevent and ameliorate the diseases, to consolidate the health and to develop the physical qualities necessary for practicing sport activities” (Urichianu, Urichianu, & Urichianu, 2016, p. 4).

Gymnastics is the fundamental branch of physical education that contributes to harmonious physical development and body multilateral mastering. It has a wide applicability in the other branches of sports and everyday life. Gymnastics in school is found in all education levels, having a very important role for balanced physical development and better health; it provides the basic physical support necessary for practicing performance gymnastics and for initiation in other sports (Potop, & Marinescu, 2014).

In terms of physical education and sport, the school curriculum reflects the specific contribution that this subject must make to the achievement of goals and objectives of the secondary school stage and the associated curricular cycles. Curriculum is structured on framework goals, reference objectives, examples of learning activities and contents. Depending on education level, some categories of contents mentioned in curriculum could become learning units. The structure of each learning unit includes a predictive evaluation at the beginning and a summative evaluation in its end (Dragomir, & Scarlat, 2004).

2. Problem Statement

Didactical design reflects how the teacher, schoolmaster or physical education teacher conceives the achievement of the benchmarks for each grade from 1st to 8th and the specific competences for 9th to 12th/13th grades. Although every school teacher is in possession of unitary documents, namely: structure of school year, curriculum, physical education syllabus, National School System of Evaluation, the didactical design gets a customized character, each own (Dragomir, & Scarlat, 2004).

The multifactorial and multidimensional definition of “Strength” concept involves many difficulties in the way to define it. A. Demeter (1981) defines strength as „the capacity of the neuro-muscular system to defeat resistance by movement, based on muscles contraction”. Since most of the factors that influence and determine strength are perfectible, we are able to say that strength too is easily

perfectible. The process of strength development can reach the expected results because the factors that influence these qualities are perfectible too. The effectiveness of strength development depends on the modality to approach the training methods, the particulars and possibilities of the individual (Virgil, 1999, p. 35).

All authors indicate strength as the motor skill that must be trained in all school grades. In the early years of secondary school it is recommended to make exercises with one's own body weight in order to improve strength of extensor muscles in general and postural strength particularly. Afterwards it is indicated to make exercises focused on the main muscle groups, executed with one's own body weight or with small and medium weights.

Educational standards of students' general and motor physical training provide information on the most effective methods and means related to students' capacities (Grimalschi, & Baian, 2011, p.62).

The circuit is the most frequently used methodical process for strength development, especially during activities carried out with subjects aged 7 to 15 years. The circuit must not be mistaken for activities in workout stations or groups. In the structure of the lesson or training session it is placed before body cool down after effort (Potop, & Marinescu, 2014, p. 66). Thanks to the individualized work, the circuit has effects both on morpho-functional indicators and cardio-vascular system. Various specialists (Scholich, Mitra, Mogoş, Tibacu, Cârstea) describe several variants of the circuit, determined by volume, effort intensity, duration of breaks, forms of organization etc. (Dragnea, & Bota, 1999, p. 231).

Puberty, this phase of great morphological and functional transformations of the growing body becomes a serious and important issue especially for girls, because starting from 13 to 14 years old, they have the tendency to slowdown the motor skill development from various reasons, they skip the physical education classes or even drop completely sports activities. The development of motricity in pubertal age students has two basic aspects: raising the motor skills to a higher stage and creation of new motor skills (Dragnea & Bota, 1999).

3. Research Questions

To achieve the research, we proposed doing the tasks as follows:

- Will the diversification of the contents of the application methodology and means and the use of circuit method during the class of physical education in 8th grade highlight the level of "Strength" motor skill development?
- Will the evaluation of motor skills level of the students-subjects of research, by control events and tests selected from the School National System for Evaluation in 8th grade, reveal the influence of the applied means on the achievement of the learning unit?

4. Purpose of the Study

Assessing the impact of the teaching technology applied to achieve the learning unit of „Strength” motor skill using the circuit method in the case of 8th grade students.

5. Research Methods

This scientific approach has led to the organization of an experimental study in the primary school of Măldăeni, Teleorman County. The study was carried out during school year 2015 – 2016, with a single experimental group of 8th grade formed of 16 students (8 boys and 8 girls).

The following research methods were used in this study: study of documents analysing the school transcripts of students; method of pedagogic observation; method of experimental study; method of test and control events, method of circuit and statistical-mathematical method (KyPlot software).

System of means and application methodology:

- Random composition of subjects group and distribution of subjects per gender (8 girls and 8 boys);
- Differentiated structure of circuit content, low difficulty for girls and medium for boys, 8 exercises (workout stations), activity in workout station – 20 sec., break equal to activity in workout station while the break between sets (circuits) is 2 min;
- Moving from one workout station to another clockwise;
- A preliminary warm up (preparation of body for effort) using a set of free exercises for general physical development is recommended before starting the work program in circuit.

Tests and control events:

- Test 1 – push-ups with arms apart (number of correct executions);
- Test 2 – maintaining the hang up position at fixed bar, pronation grip with bent elbows, student's chin at bar level (seconds);
- Test 3 – standing long jump (cm);
- Test 4 – torso raise to the vertical from supine position for 30 sec (number of correct and successive executions);
- Test 5 – torso extensions with hands behind neck for 30 sec (number of correct and successive executions);
- Test 6 – pelvis raise from supine position, with soles fixed on the floor and bend knees for 30 sec (number of correct and successive executions);
- Test 7 – stretched legs raise to the vertical from supine position at rib stall for 30 sec (number of correct executions).

These tests and control events were selected in conformity with the provisions of National School System for Evaluation of physical education and sport in 8th grade (National Curriculum, 1999).

6. Findings

The use of didactical technology for achievement of “Strength” motor skill learning unit during physical education classes was performed by means of circuit method with activity in workout stations. Tests and control events selected from the National School System for Evaluation in 8th grade were applied in order to highlight the effectiveness of this method.

Table 01. Results of boys' motor training evaluation (n=8)

Statistical Indicators	Test 1		Test 2		Test 3		Test 4		Test 5		Test 6		Test 7	
	IT	FT												
X	8.87	12.0	11.75	14.00	185.6	193.0	23.63	27.63	22.25	27.25	20.63	25.37	14.5	22.25
SED	0.78	0.65	0.67	0.59	6.84	6.35	0.75	0.73	0.84	0.75	0.59	0.49	0.33	0.56
SD	2.23	3.43	1.91	1.69	19.35	17.95	2.13	2.06	2.37	2.12	1.68	1.41	0.93	1.58
Cv%	25.15	15.43	16.24	12.07	10.42	9.30	9.03	7.48	10.67	7.78	8.17	5.54	6.38	7.11
t;	13.79;		13.74;		8.97;		10.58;		9.35;		19.00;		21.18;	
P	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	

Note: Test 1-7 – tests and control events used, X – arithmetical mean, SED – standard error deviation, SD – standard deviation, Cv – coefficient of variation; t – Parametric Test Paired Comparison for Means; IT – initial testing, FT – final testing.

Table 02. Results of girls' motor training evaluation (n=8)

Statistical Indicators	Test 1		Test 2		Test 3		Test 4		Test 5		Test 6		Test 7	
	IT	FT	IT	FT	IT	FT	IT	FT	IT	FT	IT	FT	IT	FT
X	3.75	6.25	8.25	10.75	156.25	163.75	18.13	23.75	19.5	24.5	16.0	22.0	12.37	19.75
SED	0.75	0.88	0.67	0.73	5.32	4.63	0.97	1.46	1.04	0.91	1.85	0.84	0.59	0.92
SD	2.12	2.49	1.91	2.05	15.06	13.09	2.75	4.13	2.93	2.56	3.43	5.71	1.68	2.60
Cv%	56.57	39.88	23.13	19.09	9.64	7.99	15.16	17.39	15.01	10.46	11.57	10.86	13.62	13.18
t;	13.22;		13.23;		8.66;		9.44;		11.83;		15.87;		17.56;	
P	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	

Note: see table 01.

Tables 01 and 02 show the results of motor skill evaluation of boys and girls – subjects of the research. The results of the statistical-mathematical calculations point out the improvement of arms, legs, abdomen and back muscle strength. The comparative analysis of the averages between tests for both boys and girls highlight significant differences at all tests evaluated; the value of calculated *t* is higher than the value of statistic *t* at $p < 0.001$. These results confirm the correct use of the methodology of circuit method application with activity in workout stations during physical education classes for 8th grade students.

7. Conclusion

In the light of the values obtained during seven test events carried out in the initial and final testing we can draw the conclusion that this experimental group was able to make obvious progresses following up the application of circuit method in the physical education class.

The way of organizing the practice and the selected exercises helped to develop „strength” motor skill and some combined motor skills (strength in endurance conditions, strength in speed conditions).

Through its specific influences and tasks, the circuit is an excellent method to apply a customized and incentive evaluation system that checks students' adaptation to effort and the appropriate adjustment of effort by modifying the circuit sheet.

The large variety of exercises used during the circuit is a contributory factor for the development of muscles trophicity and tonicity; thus the body harmonious development is achieved.

The interest shown by students to develop strength by working in circuit in different workout stations proved that the method of circuit used in the class of physical education is highly effective, which was also demonstrated by the results obtained after this study.

Acknowledgments

This paper is part of the research plan themes of the Faculty of Physical Education and Sport of Bucharest Ecological University for 2015 – 2016. We express our gratitude to teacher Sima Laura for the support and help granted to achieve this experimental study.

References

- Demeter, A. (1981). *Physiological and Biochemical Fundamentals of Motor Skills*. Bucharest: Editura Sport-Tourism.
- Dragnea, A., & Bota, A. (1999). *Theory of Motor Activities*. Bucharest: Didactic and Pedagogic Publishing House.
- Dragnea, A., Bota, A., Stănescu, M., Teodorescu, S., Șerbănoiu, S., Tudor, V. (2006). *Physical Education and Sport – Theory and Didactics*. Bucharest: FEST Publishing House.
- Dragomir, P., & Scarlat, E. (2004). *School Physical Education. New Landmarks – Necessary Mutations*. Bucharest: Didactic and Pedagogic Publishing House, R.A.
- Grimalschi, T., & Baian, I. (2011). *Physical Education. Guidelines for implementing the modernized curriculum for primary and secondary cycle*. Chișinău: Lyceum.
- Joița E. (1998). *Effectiveness of Instruction, Contemporary Pedagogic Ideas*. Bucharest: Didactic and Pedagogic Publishing House.
- Ionescu, M., Radu, I., Chiș, V., Ferenczi, I., Lăscuș, V., & Preda V. (1995). *Modern Didactics*. Cluj-Napoca: “Dacia” Publishing House.
- Ionescu, R. (2005). *Physical Education. Operational Means for Lesson Topics Solving*. Bucharest: Educational Humanitas Publishing House.
- National Curriculum. (1999). *Middle School Curriculum*. Ministry of National Education. National Council for Curriculum. Bucharest.
- Potop, V., & Marinescu, S. (2014). *Gymnastics in School – Methods of Gymnastics Branches*. Bucharest: Discobolul.
- Urichianu, B., Urichianu Toma, S., Urichianu, A., I. (2016). Features of motion development in primary students, International Scientific Session “*Physical education and sport, healthy lifestyle boost factors*”. Ecological University Bucharest: Editua Printech.
- Virgil T. (1999). *Conditional, Coordinative and Intermediate Abilities – Components of Motor Skill, Coordinative Abilities*. Bucharest: Editura R.A.I. „Coresi”.