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DIFFERENT METHODS OF WORK IN DEVELOPING DYNAMIC AND STATIC FORCE IN STUDENTS

Milazim KAMBERI[1,*], Vullnet AMETI[1], Fitim ARIFI[1], Hyjnor KICA[1]

[1]*State University of Tetova, Faculty of Physical Education, Tetovo – North Macedonia.*
[*]*Corresponding author e-mail: milazim.kamberi@unite.edu.mk*

Abstract

The main purpose of this research is to confirm the contribution of methodological forms of work for the development of dynamic force and static force in students, as well as to determine the effects of the demonstration method on the level of mastery in the practical part.
The sample selected in this research was a total of 242 students, from the Gymnasium "Sami Frashëri" Technical School "Nace Bugjoni", Economics School "Pero Nakov" from Kumanovo and Gymnasium "Ismet Jashari" Lipkovo. The sample was divided into three groups: in the examined group 1 (n = 84), in the experimental group 1 (n = 77) and in the experimental group 2 (n = 82). Measuring instruments for this research for the evaluation of dynamic force motor skills between the examined group and the experimental groups were used eight variables of explosive force, six variables of repetitive force and six variables of static force. Characteristics results between groups were processed through the SPSS mathematical program for windows version 16, the evaluation of the achieved results and the discussion were realized by the basic statistical analysis, the difference between the initial and final measurements through the T-test for dependent groups, and to prove importance of statistical differences, the assessment was made by multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA), in which case the differences between the initial and final measurement groups in experimental group 1 and experimental group 2 and the control group were confirmed.
In conclusion we can say that the programmed training process and the methods used have influenced and have been positive in the development of dynamic and static motor force skills in students, based on the results achieved we estimate that such research is needed in the whole country.

Keywords: static force, dynamic force, student, MANOVA, ANOVA.

1. Introduction

All the processes of transformation in kinesiology have a general meaning and represent each time a change, ie a transformation of the system of human anthropological dimensions.
The information that comes from the dimensions of anthropological status can be transformed under the influence of some motor activities in the process of teaching physical education and health, it is also extremely important for practice.
One of the primary tasks of teaching physical and health education is to transform the anthropological status of students through physical activity and sport as a means to achieve this goal.
Qualitative changes are understood as such effects of the learning process, respectively the current program contents which are reflected in the change of anthropological dimensions of students.
Such changes can affect the motor aspect of the subject in different ways, therefore the analysis of such changes is an integral part of each student's control in terms of evaluating the effects of the physical and health education curriculum.
At the core of motor skills, like any other form of learning, lie cognitive processes. Motor learning can be explained in accordance with social cognitive theories of learning.
Proponents of cognitive theories see learning as the product of one's efforts to analyze a situation, observe relationships, and solve problems. Thus, what happens to the individual (including current and past

experiences) is a variable that is "inserted" between stimuli and responses (s-O-r).
In cognitive theories, Laviss, Deviterne and Peerin, (2000), two separate types of information are assumed, which act in the formation of motor responses.
These are the memory trail that contains the information needed to start and direct the movement and the perceptual trail that contains the information needed to start and direct the movement and the perceptual trail that contains information about how the movement should look (visual information) and view (information visual) and how should the practitioner feel (proprioceptive information).
During motor performance the comparison processes are activated which analyze the difference between the actual motion and the desired trace (Gao practitioner feeling).
From the point of view of social theories of learning motor activities according to the model or way, it is the elementary form of social learning based on the assumption that learning takes place in the interaction of the individual and the social environment.
Thus, learning according to (Bandura, 1963) is called model learning or modeling, but to evaluate the success of model learning, it is important to determine the contribution of cognitive skills on which model perception depends.
Combining cognitive factors with the concept of social learning, a socio-cognitive theory of observational learning emerges (Bandura, 1986; Carrol & Bandura, 1990), according to which the modeling of a performance movement has been previously organized in cognitive level.
The adoption of a motion demonstrated by the model depends on several types of processes, such as attention, motor reproduction, motivation, and the like. Forming a clear idea of the movement to be mastered is essential to learning a new motor activity.
As is well known, demonstration is the most effective method used in the process of creating the notion of movement, especially in working with the youngest school age.
Demonstration can be direct or indirect. In the case of a live demonstration, the demonstrator is a teacher or an advanced practitioner, and the indirect demonstration is presented through film, filming, cinematographic drawings, and the like.
Through this paper we will present different methods of working with students from the Kumanovo region for the development of dynamic and static force.

2. Methods

The sample selected in this research was that of first and second grade high school students aged 15 and 16 ± 6 months.
The research was conducted on the students of the gymnasium "Sami Frashëri" in Kumanovo, the Technical School "Nace Bugjoni" in Kumanovo, the Economics School "Pero Nakov" in Kumanovo and the gymnasium "Ismet Jashari" in the municipality of Lipkovo.
In this research were included samples of 159 students divided into two sub-samples, experimental group 1 (77 respondents) practicing work and circular study new motor task with direct demonstration and experimental group 2 (82 respondents) of which practiced the methodological form with workstations and learned a new motor task with indirect demonstration.
While in this paper the system of dynamic force variables with the skills of explosive motor, repetitive motor and static motor is used as follows: The variables of explosive force were: Long jump, High jump, Standing Long Jump, Throwing medicine, Medicinball throw with turn, Ball throwing, sprint running from 20m high start, High jump from running.
The variables of repetitive motor were: Raising the body from the seat, covering the outstretched body, pumps, joints, half squat, pressing from the bench.
The variables of static motor were: joint support, thrust stability, body extension on the table, flexibility stability, half-squat load and horizontal posture lying on the back.

In this paper the measurements were performed by a group of experts in physical education and sports, and the results of experimental group 1 and experimental group 2 as well as the obtained examination was statistically processed and the mathematical package of the program "SPSS 16.0 for Windows" was used.
And are calculated based on the analysis of univariate variance (ANOVA) and multivariance (MANOVA) through which quantitative differences are determined between groups and for each variable separately.

3. Results

The summary of the results is based on the multivariate analysis of the initial measurements in Table 1, in this case the differences between the groups are observed in the statistically valid value at the level (p = 0.000).
Regarding the statistical significance of the differences between the first experimental group (E1) and the second experimental group (E2) in the initial measurements in the variables for estimating dynamic force and static force, we can conclude that most of the applied variables showed a difference between groups in the initial measurement (Table 2).

Table 1. Multivariate analysis of variance between experimental group (E1) experimental group (E2) in the variables of dynamic force and static force in initial measurements

Wilks' Lambda	Rao's R	df1	df2	P	Pillai-Bartlett Trace	V (20,148)
0,32	15,60	20,00	148,00	0,00	0,68	15,60

Table 2. Multivariate analysis and the importance of differences between the experimental group (E1) the experimental group (E2) in the variables of dynamic force and static force in the initial measurements

Variable	E1 EKSPERIMENTALNA GRUPA 1	E2 EKSPERIMENTALNA GRUPA 2	F(df1,2)	P
MFESDM	201,89	179,15	50,68	0,00
MFESVM	43,80	39,15	15,57	0,00
MFETRO	628,68	607,10	4,37	0,04
MFEBML	654,18	682,38	4,64	0,03
MFEBMG	612,33	618,66	0,23	0,63
MFEBLO	35,53	35,88	0,23	0,63
MFE20V	3,91	4,12	1,11	0,29
MFESZV	46,68	41,07	20,53	0,00
MRADTS	51,80	40,29	17,45	0,00
MRAZTL	54,40	43,20	18,23	0,00
MRASKL	21,91	15,55	12,14	0,00
MRAZGB	9,26	8,32	1,30	0,26
MRAEST	39,81	31,29	16,90	0,00
MRABPT	20,71	17,93	4,43	0,04
MSAVIS	34,93	27,63	16,46	0,00
MSASKL	17,75	11,01	25,47	0,00
MSAPRE	14,86	8,60	68,98	0,00
MSAIFL	57,62	40,02	22,67	0,00
MSAIZP	95,00	109,44	6,13	0,01
MSAHIT	57,81	46,96	63,31	0,00

Table 3 presents the results of the multivariate analysis in the final measurements and in this case the

differences between the groups in the statistically valid value at the level (p = 0.000) are noticed.
Differences between the first experimental group (E1) and the second experimental group (E2) in the final measurement in the variables for estimating dynamic force and static force, we can conclude that most of the applied variables contribute to the difference between the groups in the final measurement. (Table 4).

Table 3. Multivariate analysis of variance between experimental group (E1) experimental group (E2) in the variables of dynamic force and static force in the final measurements

Wilks' Lambda	Rao's R	df1	df2	P	Pillai-Bartlett Trace	V (20,148)
0,32	15,64	20,00	148,00	0,00	0,68	15,64

Table 4. Multivariate analysis and the importance of differences between the experimental group (E1) the experimental group (E2) in the variables of dynamic force and static force in the final measurements

Varijable	E1 EKSPERIMENTALNA GRUPA 1	E2 EKSPERIMENTALNA GRUPA 2	F(df1,2)	P
MFESDM	205,89	181,86	54,01	0,00
MFESVM	46,47	41,56	16,08	0,00
MFETRO	648,21	626,32	4,25	0,04
MFEBML	682,35	706,76	6,13	0,03
MFEBMG	636,41	649,64	1,27	0,26
MFEBLO	37,75	37,25	0,34	0,56
MFE20V	3,77	3,94	2,13	0,15
MFESZV	49,56	43,39	23,37	0,00
MRADTS	58,96	46,55	16,82	0,00
MRAZTL	62,05	50,00	17,65	0,00
MRASKL	26,99	18,77	16,35	0,00
MRAZGB	12,21	10,10	5,41	0,02
MRAEST	45,14	36,92	13,39	0,00
MRABPT	25,44	22,20	4,97	0,03
MSAVIS	42,69	33,06	22,32	0,00
MSASKL	23,60	13,51	46,31	0,00
MSAPRE	20,16	11,12	103,53	0,00
MSAIFL	67,74	50,61	19,73	0,00
MSAIZP	105,62	121,10	6,59	0,01
MSAHIT	68,33	59,63	30,08	0,00

4. Discussion

Through this paper and the analysis of the obtained results of the initial measurements between the experimental group (E1) and the experimental group (E2) through multivariate analysis it can be verified that statistically significant differences have been presented in the level (p = 0.000). Also in the final measurements between the first experimental group (E1) and the second experimental group (E2) between the testers there were statistically significant differences in the level (p = 0.000).
Differences with statistically significant values between the first experimental group (E1) and the second experimental group (E2) in the initial measurements in the variables for estimating dynamic force and static force, the results showed that most of the applied variables showed a difference between groups in the initial measurement.

Also in the final measurements between the first experimental group and the second experimental group in most variables are presented differences of statistical significance between the groups in the final measurements.

Analyzing the results of the initial measurements and the final measurements of the experimental group (E1) and the second experimental group (E2), have shown a very formal transformation which proves us statistically, because based on the work done by the group of the second which was tasked with circular work and at stations for static strength and dynamic strength as opposed to the first group having only physical education and sports classes.

It can be concluded that the program of the two working methodologies, the circular one and the one with stations, have proven to be effective in the development of dynamic and static force. Such research is recommended to be done in other parts of the country because the work based on programs with the methods used such as work in circular and work in stations for dynamic force have been positive in the development of dynamic and static motor force skills in students in the Kumanovo region in Northern Macedonia, based on the results achieved, we consider that such research is needed throughout the country but also with other generations because it is very important to schedule physical education and sports classes in the process educational.

References

[1]. Adams, J.A. (1971). A closed – loop theory of motor learning. Journal of Motor Behavior. 3, 11-150.

[2]. Adams,K., Oshea, K.L., Climstein, M. (1992). The effect of six ëeeks of squat, plyometric and squat-plyometric training on poëer production. Journal of Applied Sports Science Research. 6(1),36-41.

[3]. Anderson, F.C., Pandy, M.G., (1993). Storage and utilization of elastic strain energy during jumping. J Biomech, 26(12):1413-27.

[4]. Antekolović, Lj. (2003). Ergo-jump- jednostavna procedura za testiranje skočnosti. U Ž. Hraski I Br. Matković (ur.), Trener I suvremena dijagnostika, zbornik radova (str. 51-56). VIII. Zagrebački sajam športa Zagreb: Fakultet za fizičku kulturu.

[5]. Antekolović, Lj., Žufak, G., Hofman, E. (2003). Metodika razvoja eksplozivne snage tipa skočnosti, Kondicijska priprema sportaša. Zbornik radova (219-224). Zagreb: Zagrebački velesajam.

[6]. Avis, F.J., Toussaint, H.M., Huijing, P.A. van Ingen, S.G.J. (1987). Drop jumping. II. The influence of dropping heiht on the biomechanics of drop jumping. Med Sci Sports Exerc, 19(4):339-46.

[7]. Babin, J., Vlahović, L.(2001). Utjecaj nekih motoričkih sposobnosti na uspjeh u nastavi tjelesne i zdravstvene kulture, Zbornik radova, 10. ljetne škole pedagoga fizičke kulture Republike Hrvatske, Programiranje opterećenja u području edukacije, sporta i sportske rekreacije, 101-103, Poreč.

[8]. Bajramović, I. 82007). Nivoi transformacija motoričkiih sposobnosti I uspješnosti nogometaša pod uticajem programiranog rada. Magistarski rad. Sarajevo: FASTO

[9]. Bala, G. (1986.): Kvantitativne metode u fizičkoj kulturi, Fakultet za fizičku kulturu, Novi Sad,

[10]. Bandura, A. (1971). Psichological modeling. N.Y. Aldine – Atherton.

[11]. Bandura, A., Ëalters, R.H. (1963). Social learning and personality development. N.Y., Holt. Rinehart and Ëinston.

[12]. Bangsboo, J. (1994). Fitness Training in Fotball. Denmark. University if Kopenhagen.

[13]. Bangsboo, J. (1994). The physiology os Soccer – ëith Special Reference to Intense Intermittent Exercise. Acta Physiologica Scandinavica, 151, (Suppl. 619), str. 1-115.

[14]. Bilić, Ž., Bonacin, D., Manić, G., Talović, M.(2006). Kompozitna definicija bazičnih kinezioloških procesa kod dječaka viših razreda osnovne škole, Homo sporticus, br.1,str.54-56, Sarajevo.

[15]. Bompa, T.O. (2000). Theory and Methodoloy of Training. Illionis: human Kinetics.

[16]. Bosco, C., komi, P.V., Ito, A. (1981). Prestretch potentiation of human skeletal muscle during ballistic movement. Acta Physiol Scand, 111(2):135-40.

[17]. Broën, L. (2004). Brzina, agilnost, eksplozivnost. Zagreb. Gopal

[18]. Čabrić, M. (1970). Razvoj snage u sportu. Beograd: Partizan.

[19]. Carol, ËR. Bandura, A. (1990). Representation guidance of action production in observatorial learning: A casual analysis. Journal of Motor Behavior, 22 (1): 85-97.

[20]. Chu, D.A. (1998). Jumping Into Plyometrics. Champaign, IL: human Kinetics.

[21]. Chu, D.A. 81991). Jumping into ply metrics. Champaign, IL: “leisure Press”.

[22]. Čoh, M. (2001). Biomehanika atletike. Ljubljana. Fakultet za šport.

[23]. Čoh, M. (2004). Razvoj brzine u kondicijskoj pripremi sportaša. Kondicijska priprema sportaša, Zbornik radova (str. 229-235). Zagreb. Zagrebački športski savez.
[24]. Čolakhodžić, E. (2008). Quantitative changes of motoric abilities ëith senior soccer players. 5th International Scientific Conference on Kinesiology. Kinesiology Research trends and Applications. Zagreb: Faculty of Kinesiology.
[25]. Čolakhodžić, E. (2008). Transformacioni procesi morfoloških karakteristika I motoričkih sposobnosti kod nogometaša uzrasta 12-15 godina. Magistarski rad. Sarajevo: Fakultet sporta I tjelesnog odgoja.
[26]. Ćorluka, M. (2005). Utjecaj bazično-motoričkih sposobnosti na uspjeh nogometaša uzrasta 12 do 14 godina. Magistarski rad. Sarajevo: FASTO.
[27]. Deviterne, D., Perrin, P. (2000). Mental processing in motor skill acquisition by young subjects. International Journal of sport Psychology. 31: 364-375.
[28]. Đurić, Đ. (1999). Teorije učenja, Autorizovane beleške predavanja održanih studentima specijalističkih studija na Učiteljskom fakultetu u Somboru januara 1999 godine, Sombor, Učiteljski fakultet – Interno izdanje.
[29]. Gredelj, M., Metikoš, D., Hošek, A., Momirović, K. (1975). Model hijerarhijske structure motoričkih sposobnosti. 1. Rezultati dobijeni primjenom jednog neoklasičnog postupka za procjenu latentnih dimenzija. Kineziologija, 5(5), 7-81.
[30]. Kamberi, M., Novaković, R., Shala, S. (2008). Uticaj bazičnih-motoričkih sposobnosti I konativnih karakteristika na uspješnost izvođenja kretnih struktura iz odbojke I košarke učenika srednje škole. Mostar. Nastavnički fakultet Univerziteta Džemal Bijedić, naučno-struči časopis "Sportski logos", god.6.br.10-11.str.11-15.
[31]. Rushall, B.S., Siedentop, D. (1972). The development and control of behavior in sport and physical education, Philadelphia, Lea & Febiger.
[32]. Zatsiorsky, V.M. (1995). Science an practice ojsrength training. Champaign, Il: Human kinetics.