Table 2. Occupational level during school holidays

Period	Occupational level
Week	15%
Week-end	75%

CONCLUSIONS

The conclusions of the research have been extracted from the study of the literature of specialty, the most important being the following:

1. Practicing the mountain tourism supports the development of the human being by acquiring a better health status, by cultivating the pleasure to move in the open, by the optimization of the contact between man and nature and of interhuman contacts presenting a very important motivational area nowadays.

2. The process of global economic restructuring obliges national economies and local communities to adaption in order to maintain and increase the economic and social competitivity through changes, both in the structure of the touristic background and in the modalities of using and capitalizing it. These changes together with the last novelties in the spending of the leisure time constitute the basic support of the touristic development, in an sustained upward rhythm.

. 3. First, spaces and simple sport grounds endowed with minimal equipments prove to be necessary for the practising of sportive games like football, voleyball, handball, basketball, etc. Most leisure places offer ideal conditions for the arrangement of such sportgrounds which must not respect obligatory dimensions. In order to meet the requirements of those manifesting the wish to use these small bases, different sport outfit and materials, especially balls, could be let. Nevertheless, many other modalities can be offered to those attending such leisure areas.

REFERENCES

1. Barco, A., Nedelcu, E., (1974), *The Argeş District,* Academy Printing House, R.S.R., Bucharest.
2. Basi, Cd Guidebook (1997), *Published and distributed by British Association of ski instructors Glenmore*, Aviemore Inverness-Shire, Scotland, Uk.
3. Bran, F., Dinu M., Simon, T., (1999), *The economy of tourism and the environment*, Economic Printing House, Bucharest.
4. Bran, F., Dinu M., Simon, T., (1997), *Rural tourism. European Model*, Economic Printing House, Bucharest.

COMPARATIVE STUDY ON THE DEVELOPMENT LEVEL OF MUSCULAR STRENGTH IN THE FEMALE STUDENTS OF THE FACULTY OF SPORT AND PHYSICAL EDUCATION (FSPE) AND THE FACULTY OF AUTOMATICS, COMPUTER SCIENCE, ELECTRICAL AND ELECTRONIC ENGINEERING (FACSEEE)

George Dănuţ MOCANU

„Dunărea de Jos" University of Galati, Romania

Abstract

One of the determining elements of motor ability at any age stage, i.e. muscle strength, and the methodology of its development are intensely discussed in the specialised literature of the field of the sport and physical education studies. Considered by most specialists, besides coordinative ability as one of the main motor skill in producing movement, it is also decisive in the manifestation of the other conditional motor skills – especially speed and endurance-, to which it is often combined, and also it favourably influences the manifestation of flexibility, whose parallel development is optimal.One of the objectives of physical education at the level of higher education for the faculties whose speciality is not sport-related is "Optimizing the individual level of physical training, insisting on the motor skills considered as deficient". Assessing the degree of the students' physical training is

important because of the strong conditioning it has with the superior-level manifestation of the movement ability, actualised in the better adaptation to effort and the ease in applying the motor skills/ technical procedures specific to the sport branches practised during the physical education lessons. The present study aims at comparing the development indices of various forms of strength manifestation and combinations, following a battery of tests, identical for the female students in the Faculty of Sports and Physical Education (FSPE) and the Faculty of Automatics, Computer Science, Electrical and Electronic Engineering (FACSEEE). In the former case, according to the sports practised, the results are superior in most forms of strength manifestation. In the latter case, the specific features of the speciality and the low number of classes allotted to physical education –only 1 hour per week-, lead to weaker performance in the registered strength indices, the notable differences proving the educability level for this motor skill and the importance of the process of scientific training in reaching superior results.
Keywords: *muscle strength, motor skills, physical training, effort capacity, motility*

INTRODUCTION

The optimum level manifestation of the strength indices is indispensable to physical activities irrespective of age, gender, motor training and movement difficulty. The degree of strength development is a complex of conditioning factors, out of which the sources [1,3,5,14,15,17,18,19] synthesize as determining the following factors : biological and structural, functional, nutritional and energetic, mental, fatigue degree, in addition to the training level and the qualitative and quantitative accumulations as direct results of the scientific intervention of sports training. Figure 1 shows the main factors with a variable influence on strength, and they should be known in order to detect the causes leading to reduction of progress in developing this particular skill. In case they do not constitute one of the possible explanations for the limitations in strength accumulation and manifestation, then the flaws should be sought in the process of specific training.

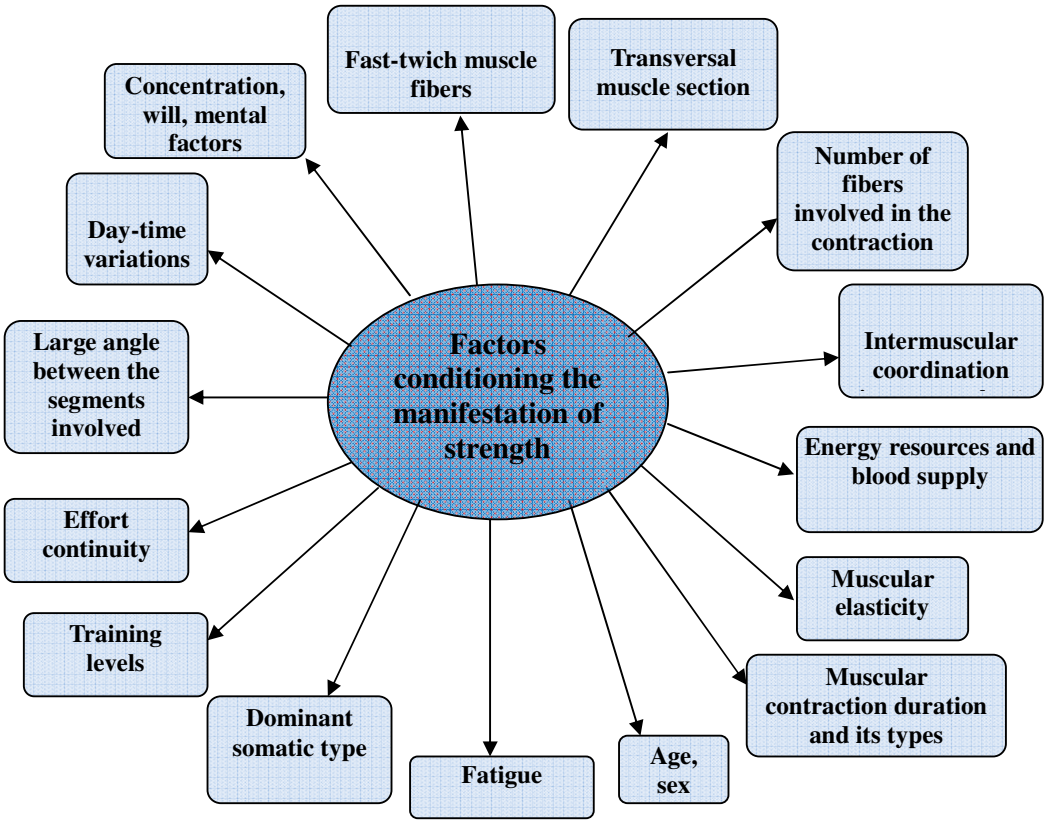

Figure 1 – Main strength determining factors

Developing strength is not a purpose in itself, but it plays a role in supporting the body's harmonious development, toning postural muscles, preventing the deficient physical attitudes at the level of the spine and other segments often generated by the lack of movement and deficient positions on the chair or at the desk, developing the muscle groups mainly involved in the technical execution of various sports. In the physical education lesson it is placed last in the chain of topics, due to the high demands on the body systems, and any

ulterior actions on other motor skills and the process of motor acquisition are negatively influenced, because of the high energy and nervous demands, leading fast to the body's exhaustion.

If the initial instruction stages –at younger ages- are restrictive in point of the use of high loads in order to prevent injuries, because of the inability of the osteoligamentous and muscular systems to cope with these strains, the group of 19-22 year-olds where most students belong is favourable to developing this skill, the sole restrictions being the medical cases. The hormonal explosion and body maturation allow great progress in strength tests; mention must be made of the fact that female students register values of up to 70-75 % of the values registered by male students, owing to less developed muscle weight [Achim Ştefan/2002/p.29.] increased loads may be used successfully after the muscle weight goes over 40% of the body weight (i.e. at the end of puberty). That is why the value of the loads, the dosage quantified by series, repetitions and breaks should be adapted to the lower possibilities of female students.

The development methodology for this motor skill is very diverse, adapted to the specifics of each stage in the ontogenetic development, and especially to the forms of manifestation and diverse combinations: static, dynamic, mixed, yielding, maintenance, overcoming, explosive, endurance, maximal, relative, relative and specific strength, etc [4, 10, 11, 16, 20].

Problem statement: The studies of the previous years carried out on students of the various specialities of the Dunarea de Jos University of Galati, i.e. Letters, Food Engineering, Mechanics, Economic Studies, etc showed an ever lower level of motor performance in coordinative capacity, speed, endurance, and also a limitation of the effort adaptation potential, deficient background of motor skills specific to various sport disciplines, physical training not suited to the age, feeding dysfunctions. All these could be explained by interpreting the data in quizzes applied to students, referring to their lifestyle and personal physical effort, leading to detecting a complex of factors accounting for this state of facts: dramatic decrease of the time devoted to individual or group physical effort, the low number of physical education classes in primary and secondary school, high school, and even university for most faculties, the lack of the students' active involvement in sports competitions promoted by their faculty, overburdened academic schedule on a daily basis, unhealthy lifestyle, fast food, need for part-time jobs limiting the amount of free time available. As strength has a decisive role in physical condition and physical performance, the identification of its development level is vital in deciding on the initial instructional level in the physical education classes.

Purpose of study : This study is concerned with determining the development degree of the highest possible number of strength manifestation forms and its combinations for the female students of the Faculty of Automatics, Computers, Electric and Electrical Engineering, and comparing these to the results obtained by the female students of the Faculty of Sport and Physical Education, who are constantly involved in physical effort by the nature of their speciality and the sport activities they perform daily. Upon processing the data and statistically interpreting the differences obtained, it can be assessed if sustained physical effort has a decisive role in increasing the strength indices; one may detect those forms of manifestation when progress is nevertheless limited and qualitative leaps not so spectacular, and thus devise training programs in order to reduce the flaws or optimise already favourable/superior results.

Working hypothesis: There are notable differences in the strength development stage for the two groups under study, and the gap may be compensated for by a careful organisation and scientific planning of the physical training process.

Body of research: The present research used the following methods, according to the guidelines in specialised literature [6,7,8,9,12,13,21,22]: the analysis of scientific and methodological specialised literature, the quiz-based and interview-based enquiry, the pedagogical observation, the method of measurements and tests, statistical-mathematical methods of result interpretation and representation.

The two lots of female students (27 girls for the Faculty of Sports and Physical Education and 50 Girls for the Faculty of Automatics, Computer Science, Electrical and Electronic Engineering) were subjected to a battery of 10 tests, aiming at the examination of the development level of various manifestation forms of muscle strength. The study was performed during the academic year 2012/2013, using the devices available in the Faculty of Sport and Physical Education and the logistics of the "Dunărea de Jos" University of Galati. The tests are as follows:

1. *Trunk lift-ups from a back-down position 30 secs*: the initial position is back-down, palms at the back of the neck, bent knees and soles fixed by a partner or an the fixed ladder; the trunk is lifted and the elbows touch the knees, then back to the initial position. The exercise tests the dynamic abdominal strength. The number of accurate repetitions is recorded. – SNSE test.

2. *Leg lift-ups from a back-down position 30 secs:* the initial position is back-down, palms at the back of the neck; when the signal goes off the student lifts the extended legs vertically and then comes back to the original position, without touching the ground. The exercise tests dynamic abdominal strength. The number of accurate repetitions is recorded. – SNSE test.

3. Trunk extensions from a face-down position 30 secs : from a face-down position, palms at the back of the neck, ankles held by a partner, trunk extensions are performed, lifting the head above the height of the gym

bench, then back to the initial position. The exercise tests the dynamic strength of the back muscles. The number of accurate repetitions is recorded. – SNSE test.

4. Simultaneous lift-ups of the arms and legs from a face-down position 30 secs: from a face-down position, strong extensions of the trunk, with the simultaneous lift-up of the extended arms and legs, above the level of the gym bench. The executions lacking the required amplitude or the accurate coordination of arms and legs are not counted. The exercise tests the dynamic strength of the back muscles, the flexibility of the muscle chains under strain and the quality of intersegment coordination.

5. Dynamometry left/right: it measures the maximum strength of the palm flexors. The subject holds the dynamometer in her palm with the forearm extended, flexing the palm with the most strength she can muster, without swinging the body or the arm tested. It is recommended to adjust the dynamometer according to the palm size of each subject taking the test. Two attempts are allowed and the best result is recorded for each palm. The following table shows the value of performance and the qualifications obtained for adult subjects /Stan Z.-2009, p.161:

Table 1: Interpretation of qualifications for the results obtained in dynamometry

Males	**Females**	**Qualification**
> 64	> 38	Excellent
56-64	34-38	Very good
52-56	30-34	Above average
48-52	26-30	Average
44-48	22-26	Below average
40-44	20-22	Weak
< 40	< 20	Very weak

6. Throwing the rounders ball with wind-up: The throw is performed on a marked spot, single-handedly, by throwing the ball over the shoulder. The exercise measures the explosive strength of the able arm. The length of the throw in metres is recorded.

7. Long jump without take-off: the tips of the feet are aligned behind a line, the soles placed at shoulder width, arm swing, doubled by the bending and extension of the legs, energetic impulse, take-off, long jump, concluded by a two-feet landing. The distance in centimetres from the starting line to the heel placed closest to it is measured and recorded. The test determines explosive strength/ lower limb impulse.

8. Maintaining the hanging position: hanging from the fixed bar irrespective of the grip – from above or from below-, a chin-up is performed, until the chin goes above the bar level, and the duration when this position is timed in seconds, until the chin goes under the level of the bar. The exercise determines the static strength in endurance regimen, especially at arm level. Eurofit and SNSE test.

9. Push-ups: From a face-down position, supported by the palms and toes, stretched out body, eyes forward; the arms are bent until the chest gets close to the ground and then the initial position is resumed. The number of successive executions is recorded, without time limit. The motion should be continuous, without interruptions, which would allow the muscles involved in the effort to recover. The test determines the dynamic strength in endurance regimen for the upper limbs muscles. SNSE test.

10. Sit-ups: From a sitting position, the subject has to perform 10 successive sit-ups, coming back to the original sitting position, without using the upper limbs—the arms are crossed over the chest. The sit-up technique is freely chosen by the subject. The duration necessary for the 10 sit-ups is recorded, lower times representing superior performance, the exercise tests the muscle strength of the lower limbs, the results being also influenced by the mobility of the joints involved in the effort, and also by adopting an efficient technique.

Findings and results, conclusions and recommendations: The data obtained upon testing and measurements were transferred and processed by means of the statistical calculus program SPSS [*Statistical Package for the Social Sciences*]. The results obtained, the average values for the two lots and the significance are shown in Table 2. Mention must be made of the fact that part of the girls in FACEEE could not complete a series of tests, which led to a lower score of this group in these tests. It is obvious that in most tests, the differences between the two lots under study were notable, as seen from the t values and the corresponding significance thresholds.

Table 2 – Main statistical indices for the lots involved in strength test

No.	Test	Group type/no. of cases	Average	Average difference	Std. error average	Std. deviation	t	P/Sig. 2 tailed
1	**Trunk lift-ups from a back-down position**	Girls FSPE (27) Girls FACSEEE (50)	21.81 16.52	5.295	.565 .502	2.936 3.547	6.622	**.000****
2	**Leg lift-ups from a back-down position**	Girls FSPE (27) Girls FACSEEE (50)	18.37 14.74	3.63	.675 .505	3.510 3.567	4.285	**.000****
3	**Trunk lift-ups from a face-down position**	Girls FSPE (27) Girls FACSEEE (50)	33.37 25.42	7.95	1.073 0.745	5.576 5.269	6.191	**.000****
4	**Arm and leg lift0ups from a face-down position**	Girls FSPE (27) Girls FACSEEE (50)	28.19 18.56	9.625	1.847 0.976	9.596 6.902	5.076	**.000****
5	**Dynamometry left**	Girls FSPE (27) Girls FACSEEE (50)	30.52 29.78	.739	0.803 0.706	4.173 4.991	0.655	**.515**
	Dynamometry right	Girls FSPE (27) Girls FACSEEE (50)	34.70 30.90	3.764	0.788 1.122	4.093 7.937	2.300	**0.024***
6	**Rounders ball throw**	Girls FSPE (27) Girls FACSEEE (50)	25.03 19.36	5.673	1.048 0.593	5.447 4.199	5.086	**.000****
7	**Long jump without take-off**	Girls FSPE (27) Girls FACSEEE (50)	172.78 144.24	28.538	4.377 2.163	22.745 15.295	6.556	**.000****
8	**Maintaining the hanging position**	Girls FSPE (27) Girls FACSEEE (50)	29.66 15.83	13.833	3.296 2.315	17.127 14.825	3.539	**.001****
9	**Push-ups**	Girls FSPE (27) Girls FACSEEE (50)	14.30 5.29	9.004	2.107 0.688	10.947 4.406	4.731	**.000****
10	**Sit-ups**	Girls FSPE (27) Girls FACSEEE (50)	19.85 29.48	-9.631	1.690 1.187	8.782 7.321	-4.809	**.000****

***(P<0.05) ; **(P≤0.001)**

The test *trunk lift-ups from a back-down position* yield a difference between the averages of the two lots of 5.295 repetitions in favour of the FSPE lot. This result corresponds to **t=** 6.622, which corresponds to a significance threshold P=.000, value < .001, so *the difference found is significant.* The justification of these values results from the importance granted to developing abdominal muscles, as a result of the efforts required in various sports.

The test *Leg lift-ups from a back-down position* registers an average difference of 3.63 repetitions to the advantage of the FSPE girls, as compared to the FACSEEE lot. The value is associated to **t=** 4.285, corresponding to a threshold P=.000, value < .001, thus *the difference found is significant*. It should be noted that this test, also determining the dynamic strength of the abdominal muscles , leads to slightly lower results for both lots, in comparison to the test analysed above. This can be accounted for by the more difficult execution technique, which involves not only strength, but also lower limb flexibility, coordination, and isometric tension of the muscles interested at the end of each repetition, in order to prevent hitting the ground with the heels.

The test *Trunk lift-ups from a face-down position* leads to a difference of 7.95 repetitions in favour of the FSPE lot. The result corresponds to **t=** 4.285, associated to a significance threshold P=.000, value < .001, so it may be said that *the difference is significant*.

The test *Simultaneous lift-ups of the arms and legs from a face-down position* gives rise to a difference of 9.625 repetitions in the favour of the FSPE lot, corresponding to **t=** 5.076, associated to a significance threshold P=.000, value < .001, so *the difference obtained is significant* in this case as well. Even if it tests the strength of the back muscles like the test before, the values registered by both lots are visibly lower, due to the limitation of the contact surface when performing the extensions, difficulties in the processes of intersegment coordination and the requirement to synchronise movements and to reach the amplitude imposed by the benchmarks, and the need to have a good joint mobility and muscle elasticity in the lumbar area.

The test *dynamometry left* produces a difference of only 0.739 kg-force in favour of the FSPE lot, corresponding to **t=** 0.655, and a significance threshold P=.515, value > .05, ***this being the only test where the difference is not significant*** **.**The explanation of this result consists in the fact that the strength of the palm muscles for the left segment corresponds in most cases to the less able arm, less used in current activities or sports. However, the average value of the FSPE lot of 30.52 kg-force corresponds to the *above average* range, and the average of the FACSEEE lot of 29.78 kg-force corresponds to the *average* range.

The test *dynamometry right* registered an average difference of 3.764 kg-force, corresponding to **t=** 2.30, and a significance threshold P=.024, value < .050, therefore *the difference is significant.* The result is accounted for by the higher strain placed on the able arm—in most cases the right arm—in the majority of sports and daily activities. The average value of the FSPE lot, i.e. 34.70 kgf corresponds to the *very well* range, while the FACSEEE average of 30.90 kgf corresponds to the *above average* range.

In the case of the test *Long jump without take-off* the difference between averages is 28.538 cm in favour of the FSPE lot, corresponding to **t=** 6.556, and a significance threshold P=.000, value < .001, thus *the difference obtained is significant* in this case. The explanation may consist in the fact that most sport disciplines impose a good development of the power/ explosive strength or spring ability at the level of the lower limbs in order to perform sprints, starts, changes of direction, leaps, bonds of various types, landings, etc.

The test *Maintaining the hanging position* shows a difference of the average values of 13.833 secs. In favour of the FSPE students, being the first test in which a part of the FACSEEE lot could not perform the required position (9 girls in this lot forfeited, not being able to maintain the position for at least 1 second, and thus being eliminated from the statistical calculations). The value of **t=**3.539 corresponds to a significant threshold P=.001, value ≤ .001, which allows us to conclude that the difference registered in this case as well is significant. The high number of cases characterised by the inability to complete this test occurred due to the fact that it tested static strength in an endurance regimen—very demanding as physical effort and mental concentration—and the working position, the high strain at the level of joints and the type of effort are not frequent in daily activities, thus requiring a high level of physical training to obtain a good result.

Also, the test *Push-ups* led to the same number of forfeitures as the previous test the difference between averages is 9.004 repetitions in favour of the FSPE lot, corresponding **t=** 4.731, associated to a significant threshold P=.000, value < .001, so *the difference is significant* in this case as well. The inability to perform or complete the test reflects a lack of interest in developing the muscle groups involved in this type of dynamic effort in an endurance regimen and a physical condition unfit for the potential of the age group in question.

The final test: *Sit-ups* is also the most challenging to both lots, with the most cases of forfeiture -12 cases- in the FACSEEE lot. The difference between the two averages is -9.361 sec., corresponding to **t=** -4.809, associated to a significance threshold P=.000, value < .001, so the *difference found is significant*.

Even if the female students in the FSPE completed the test, the difficulty in execution has to be mentioned, especially in the final repetitions, when muscle fatigue, joint pressure and coordination and balance difficulties are obvious. It should be noted that the movements imposing the annulment of the arms' action/contribution are less frequent, which led to a considerable increase in the test difficulty. The FACSEEE lot were more strongly influenced by these factors, which prevented the completion of the test, i.e. 10 repetitions. The execution technique adopted was a factor with a tremendous impact on results, 2 versions being preferred: lift-up from a sitting position, legs crossed and strong thrust in the lateral of the soles/legs, or lift-up from a sitting position by stretching a leg forward and transferring the weight on it at the moment of lift-up.

Almost all the results obtained which have been statistically processed confirm the working hypothesis, evincing the development degree of various strength types for both lots, and ***confirming the perfectible character of this skill and its*** by physical activity taking place in an organised, consistent and continuous manner. This is also supported by the significant differences found between the lots tested for most of the tests used, proving that all forms of strength manifestation may be improved: dynamic, static, explosive, endurance strength, etc.

The values obtained by the girls in FSPE are a result of the accumulations and favourable transformations registered at the muscular system, osteo-articulary system, and other systems over time, as an adaptive response to the physical strains programmed according to the specific features of each sport discipline, the FSPE lot not benefiting from a special training program allowing training centred on the tests used, and thus accounting for the motor performance shown. Nevertheless, where the movement structure was complex, unknown or involving less conventional efforts and infrequently solicited muscles, even the students in FSPE had difficulty in adapting fast to the requirements of the tests, especially the final one.

The results of the FACSEEE lot confirms the existence of issues regarding the low degree of involvement and the scarce participation of the young generation in physical activity as an indicator of poor physical condition and an alarm signal for the potential health problems caused by a sedentary lifestyle and focus on other activities outside the scope of physical effort. In addition to the personal lifestyle, the notable differences registered are also a consequence of the decrease in the number of physical education classes, in the previous educational stages/ high school, where just one hour allotted to the common core of the curriculum cannot possible achieve spectacular progress in motor skills at all levels. The present study evinces the flaws in

the strength training for the university students, thus constituting a basis for new training programs able to limit or eliminate the issues detected and to optimise the level of physical fitness.

REFE*R*ENCES:

1. Albu V. (1999.) *Teoria educaţiei fizice şi sportului*. Constanţa: Exponto, pp. 165-199
2. Achim Ş. (2002.) *Planificarea în pregătirea sportivă*. Bucureşti: Exponto, p.97
3. Alexe N.(1993). *Antrenamentul sportiv modern*. Bucureşti: Editis, pp.313-331
4. BompaT. (2001*).Dezvoltarea calitatilor biomotrice. /Scoala nationala de antrenori/* Constanta: Ex Ponto, pp.5-165
5. Dragnea A., Teodorescu Mate S. (2002). *Teoria sportului*. Bucureşti: FEST, pp.356-360
6. Epuran M., Marolicaru M. (2002). *Metodologia cercetării activităţilor corporale*. Cluj Napoca: Risoprint, 170 p.
7. Gagea A. *Metodologia cercetării ştiinţifice în educaţie fizică şi sport.* Bucureşti: Fundaţia România de Mâine, 1999. p. 15-342.
8. M.E.N.-*Serviciul Naţional de evaluare şi examinare- Sistemul naţional şcolar de evaluare la disciplina educaţie fizicăşi sport*. Bucureşti: 40p.
9. Niculescu I. I. (2006). *Evaluare motrică şi somato-funcţională.* Craiova: Universitaria, pp.10-90
10. Raţă G., Raţă B.C. (2006). *Aptitudinile în activitatea motrică.* Bacău: EduSoft, pp. 35-64
11. Săvescu I (2009). *Educaţie fizică –ghid orientativ pentru titularizare şi definitivat-*. Craiova: Aius Printed, 2008 pp 136-160
12. Simion G., Amzar L., (2009). *Stiinta cercetarii miscarii uman*e. Pitesti: Universitatea din Pitesti, pp.106-231
13. Stan Z. (2009). *Evaluare motrică si funcţională*. Galati: Zigotto, pp.159-166
14. http://ro.scribd.com/doc/99239919/Calitatile-Motrice-Si-Metodica-Dez-Lor
15. http://www.usefs.md/PDF/Cursuri%20electronice/TMAS/Teoria%20si%20metodologia%20antrenamentului%20sportiv%20%28Lectia14%29.pdf
16. http://bibliotecascolara.ro/leon_victor/Dezvoltarea_calitatilor_motrice.pdf
17. http://ro.scribd.com/doc/22573497/TEORIA-EDUCA%C5%A2IEI-FIZICE-%C5%9EI-SPORTULUI
18. http://www.slideshare.net/dragonyahoo/tefs
19. http://ro.scribd.com/doc/201404382/Forta-rezistenta-supletea
20. http://www.rasfoiesc.com/hobby/sport/PREGATIREA-FIZICA-ANTRENAMENT-71.php
21. http://www.e-learn.ro/tutorial/spss/introducere-in-spss/134/1/168.htm
22. http://www.scritub.com/stiinta/informatica/Aplicatii-SPSS12121662.php

COMPARATIVE ANALYSIS OF THE CORRELATION BETWEEN THE MUSCLE STRENGTH ASSESSMENT TESTS FOR THE FEMALE STUDENTS IN THE fACULTY OF SPORTS AND pHYSICAL eDUCATION (FSPE) AND THE FACULTY OF AUTOMATICS, COMPUTER SCIENCE, ELECTRICAL AND ELECTRONIC ENGINEERING (FACSEEE)

George Dănuţ MOCANU

„Dunărea de Jos" University of Galati, Romania

Abstract:

Strength as a motor skill has a decisive role in expressing the movement ability of any individual, as all voluntary motion involves in variable degrees the contraction of one or several muscle bundles. By the multitude of existing manifestation forms and the diversity of combinations with the other motor skills, it is a fundamental element of the motor skill, also defined as fitness in specialised literature. General strength is part of the physical fitness, in addition to local muscular endurance,