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STUDY ON THE CONSOLIDATION OF THE TECHNICAL ELEMENTS AND PROCEDURES SPECIFIC TO THE SOCCER GAME IN THE STUDENTS WHO ARE MEMBERS OF THE SECONDARY SCHOOL FOOTBALL TEAM

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Abstract

We know at present that the old idea that practice makes perfect or that more practice leads to perfection produces a paradoxical result. Each technical-tactical drill is supported by a strong foundation of scientific research, its key being to broaden the skills for the full range of weekly training. The purpose of the research is to strengthen the technical elements and procedures, specific to the game of football, in the students who make up the secondary school football team, applying a training program focused on the player in relation to the ball and the direct opponent (1x1 duel) and the player in relation to the small group, teammates, opponents (2x2; 3x3). The investigated sample consisted of 32 students, aged 13-14, students who were members of the school football teams. The research was carried out in the 2023-2024 school year, during the five modules of learning, respecting the school holidays. The assessment was carried out by applying tests specific to the education cycle, at the beginning and the end of the experiment. Statistical analysis was performed with IBM SPSS Statistics, version 28. For all statistical tests used, we chose a significance threshold $\alpha = 0.05$. The results obtained in the control tests ($p<0.05$) validate the training program.

Introduction

Technical training is the foundation of a footballer's development. Young players need to learn these techniques in the early stages of their football life. [13] As a technical foundation forms, it allows players to properly participate in the game by combining with their teammates. Passing, receiving and dribbling are fundamental skills that any young player should have in order to progress. [3]

Along with the disappearance of street football, schools and high schools play a key role in technical training. With fewer practice hours available now, there is a need to increase the quality of teaching to gain better understanding in less time. [11] A successful training should get students excited. A competitive training session with

real resistance from opponents, teammates and limited time and space is the basis of learning for young footballers. [12] Apart from these, there are separate technical sessions (technical ball control drills, passing, etc.) which are important. By ensuring that separate technical training is adapted and used into competitive training, players can accelerate their development of technical skills. [6,7]
At present, the development of the technique indicates with probability the emergence in players of technical-physical-mental-tactical abilities, which merge the four factors, allow the expression of an action which, although technical, by being carried out with the ball, has a high physical, mental and tactical load. [5,10]
In this type of action, the technical component is still present and important, but there is also the transformation of skill into capacity which takes place, a process that involves the inclusion of physical, tactical and mental components in its deep structure. [8] This aspect has actually given rise to the technique of adversity, a technique whose elements and procedures are manifested most of the

time in the aggressive fight with the opponent, in the crisis of time and space. [9] The struggle that adversity entails, engages the psyche of the players to a maximum extent. The tension and mental
pressure arising as an effect of the dispute for victory put their stamp on the technique. Under these conditions, the players are asked to demonstrate their skills based on a high technical ability. [7]
The skills (hitting the ball, catching, driving, etc.) alone, apart from this mental-tactical capacity, are irrelevant. In other words, the competition technique is related to the ability of the players to use their skills efficiently, but it also helps to consolidate and improve them. [3,2]
Therefore, in football, the technical elements and procedures are executed in more or less complex conditions, which in most cases are determined by the presence of one or more opponents, by the available space, by the speed required in that specific situation, as well as of the technical precision required to comply with a certain game plan. [1,4] These general aspects that arise constantly during the game, significantly influence the technical programs and didactic methods. That is why, during training, one must work with opponents (active or with reduced activity) or use didactic exercises that impose certain constraints (limited time, limited space, etc.). [9,11,3]

Material- Method

The purpose of the research is to strengthen the technical elements and procedures, specific to the game of football, in the students who make up the secondary school football team, applying a training program centered on the player in relation to the ball and to the direct opponent (1x1 duel) and the player in relation to the small group, teammates, opponents (2x2; 3x3). The research aims at applying this type of

training to the experimental group while a training program based on global training is applied to the control group.

The researched sample consisted of 32 students, aged 13-14, students who made up the school football teams, 16 of them from no. 29 Secondary School and 16 students from no. 43 "Dan Barbilian" Secondary School, both from Galati. The experimental research took place on the sports field of the two schools, the training conditions being similar. The research was carried out in the 2023-2024 school year, during the five modules, respecting the school holidays.

In order to carry out the research the following method was used: stage 1 - initial testing; stage 2- application of the training program focused on the player in relation to the ball and to the direct opponent (duel 1x1) and the player in relation to the small group, teammates, opponents (2x2; 3x3); stage 3- performing the final testing; stage 4- analyzing the results and issuing conclusions.

The research methods were the following: specialized literature analysis, observation, experiment, the method of measurements and tests, the statistical-mathematical method, the comparative method and the graphical method. [4] For the statistical analysis we used IBM SPSS Statistics, version 28. The experimental program included in its main part:

- the player in relation to the ball - individual technique;
- the player in relation to the ball and the goalkeeper - individual technique specific to the completion;
- the player in relation to the ball and the opponent - individual technique specific to the 1x1 duel;
- the player in relation to the ball, the opponent and goalkeepers - individual technique specific to the completion.
- the player in relation to the small group (2x2; 3x3), drills that can be carried out on fields of different sizes, with or without goals, with or without goalkeepers.

The players were assessed by applying the following tests specific to the educational cycle: [14]

1. Passing the ball in a specific area (successful attempts) – the ball placed in a fixed point; the player executes 6 shots; the ball must be sent into a square with 5 meter-side, by direct aerial trajectory, located at a distance of 20 meters from the fixed point; result – the sum of successes.

2. Driving the ball through the cones followed by a shot on goal. 5 cones are placed at a distance of 2 m from each other, 1 meter away from the center of the field. The last cone is 11 meters away from the gate. The student starts from the middle of the field, drives the ball between the 5 cones and then shots on goal. The

timer starts when the student touches the ball with his foot at the start and stops when the ball crosses the goal line.
3. Technical structure - driving the ball between 3 cones placed at a distance of 1.5 meters from each other, the first cone being 1.5 meters away from the center of the field, one-two done with a colleague sitting at the 9-meter line, on the center of the goal, followed by a shot on goal. It is measured in seconds.

Results

To perform the statistical analysis of the data we used the IBM SPSS Statistics software package, version 28.

The research is meant to compare the results obtained in the technical tests of the two groups of students who had to take two tests (initial and final). Thus, we created a database of numerical information obtained through player testing. Statistical analysis was performed with IBM SPSS Statistics, version 28. For all statistical tests used, we chose a significance threshold $\alpha = 0.05$.

In order to determine if there are statistically significant differences between the mean values of the scores obtained by the students in the initial testing and in the final testing, we used the t-test for paired samples.

The results of the experimental group were compared with the results of the control group using the t-test for two independent samples. Levene's test was required to check the equality of variances for two groups.

The Pearson correlation coefficient (r) tested whether or not there was a relationship between two data series.

Control Group

Table 1. Descriptive Statistics – control group

	Minimum		Maximum		Mean		Std. Deviation		Variance	
	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing
Passing the ball in a specific area (successful attempts)	1	2	3	4	1.94	3.06	0.680	0.574	0.463	0.329
Drive the ball through cones followed by a shot on goal (seconds)	9.21	8.60	10.55	9.66	10.090	9.1625	0.3420	0.2672	0.117	0.071
Technical structure (seconds)	10.80	9.60	11.85	10.90	11.3625	10.3819	0.3135	0.3706	0.098	0.137

In the case of the control group, at the initial testing we determined for passing the ball in a determined space an average value of 1.94 with a standard deviation of 0.680, for driving the ball between the cones followed by a shot on goal an average

value of 10.090 with a standard deviation of 0.3420, technical structure an average value of 11.3625 with a standard deviation of 0.3135.

On at the results obtained at the final testing by the control group, we determined an average value of 3.06 for passing the ball in a specific area with a standard deviation of 0.574 (increase of 57.53%), for driving the ball between the cones followed by a shot at the goal an average value of 9.1625 with a standard deviation of 0.2672 (improvement 9.19%), for the technical structure an average value of 10.3819 with a standard deviation of 0.3706 (8.63% improvement).

Table 2. Paired Samples Statistics

		Mean	Std. Deviation	Std. Error Mean
Pair 1	Passing the ball in a specific area (successful attempts) I.T.	1.94	0.680	0.170
	Passing the ball in a specific area (successful attempts) F.T.	3.06	0.574	0.143
Pair 2	Diving the ball through cones followed by a shot on goal (seconds) I.T.	10.0894	0.34198	0.08550
	Diving the ball through cones followed by a shot on goal (seconds) F.T.	9.1625	0.26720	0.06680
Pair 3	Technical structure (seconds) I.T.	11.3625	0.31353	0.07838
	Technical structure (seconds) F.T.	10.3819	0.37057	0.09264

Table 3. Paired Samples Correlations

		Correlation	Sig.
Pair 1	Passing the ball in a specific area (successful attempts) I.T.& Passing the ball in a specific area (successful attempts) F.T.	0.694	0.003
Pair 2	Diving the ball through cones followed by a shot on goal (seconds) I.T.& Diving the ball through cones followed by a shot on goal (seconds) F.T.	0.769	0.000
Pair 3	Technical structure (seconds) I.T.& Technical structure (seconds) F.T.	0.702	0.002

For the athletes in the control group, the Pearson correlation test showed that there were very strong positive correlations between the values of the initial testing and those of the final testing in all technical tests: passing the ball in a specific area (r =

0.694, p = 0.003 < 0.05), driving the ball through cones followed by shooting on goal (r = 0.769, p < 0.001), technical structure (r = 0.702, p = 0.002 < 0.05).

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Passing the ball in a specific area (successful attempts) I.T. - Passing the ball in a specific area (successful attempts) F.T.	-1.125	0.500	0.125	-1.391	-.859	-9.000	15	0.000
Pair 2	Diving the ball through cones followed by a shot on goal (seconds) I.T. - Diving the ball through cones followed by a shot on goal (seconds) F.T.	0.92688	0.21850	0.05463	0.81044	1.04331	16.968	15	0.000
Pair 3	Technical structure (seconds) I.T. - Technical structure (seconds) F.T.	0.98063	0.26921	0.06730	0.83717	1.12408	14.571	15	0.000

After performing the t-test for two paired samples to compare the results obtained by the control group in the initial testing with the results obtained in the final testing, we found a statistically significant difference for all samples: passing the ball in a specific area (t = -9.000, p < 0.001),), driving the ball through the cones followed by a shot on goal (t = 16.968, p < 0.001), the structure technique (t = 14.571, p < 0.001)

Experimental Group

Table 5. Descriptive Statistics –experimental group

	Minimum		Maximum		Mean		Std. Deviation		Variance	
	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing	Initial testing	Final testing
Passing the ball in a specific area (successful attempts)	1	3	3	5	1.94	4.00	0.680	0.730	0.463	0.533

Diving the ball through cones followed by a shot on goal (seconds)	9.85	8.45	10.48	9.15	10.2038	8.9338	0.1881	0.2090	0.035	0.044
Technical structure (seconds)	10.75	9.15	11.90	10.01	11.435	9.7225	0.3510	0.2465	0.123	0.061

In the case of the experimental group, at the initial test we ascertained for passing the ball in a specific area an average value of 1.94 with a standard deviation of 0.680, for driving the ball through the cones followed by a shot on goal an average value of 10.2038 with a standard deviation of 0.1881, technical structure an average value of 11.435 with a standard deviation of 0.3510.

As to the results obtained in the final test by the experimental group, we determined for passing the ball in a specific area an average value of 4.00 with a standard deviation of 0.730 (increase 106.19%), for driving the ball through cones followed by a shot on goal an average value of 8.9338 with a standard deviation of 0.2090 (12.45% improvement), the technical structure an average value of 9.7225 with a standard deviation of 0.2465 (14.98% improvement).

Table 6. Paired Samples Statistics

		Mean	Std. Deviation	Std. Error Mean
Pair 1	Passing the ball in a specific area (successful attempts) I.T.	1.94	0.680	0.170
	Passing the ball in a specific area (successful attempts) F.T.	4.00	0.730	0.183
Pair 2	Driving the ball through cones followed by a shot on goal (seconds) I.T.	10.2038	0.18814	0.04704
	Driving the ball through cones followed by a shot on goal (seconds) T.F.	8.9338	0.20899	0.05225
Pair 3	Technical structure (seconds) I.T.	11.4350	0.35096	0.08774
	Technical structure (seconds) F.T.	9.7225	0.24648	0.06162

Table 7. Paired Samples Correlations

		Correlation	Sig.
Pair 1	Passing the ball in a specific area (successful attempts) I.T.& Passing the ball in a specific area (successful attempts) F.T.	0.671	0.004

Pair 2	Diving the ball through cones followed by a shot on goal (seconds) I.T. & Diving the ball through cones followed by a shot on goal (seconds) F.T.	0.752	0.001
Pair 3	Technical structure (seconds) I.T.& Technical structure (seconds) F.T.	0.670	0.005

For the students in the experimental group, the Pearson correlation test shows that there are strong positive correlations between the values of the initial testing and those of the final testing in all technical tests: passing the ball in a specific area ($r = 0.672$, $p = 0.004 < 0.05$), driving the ball through cones followed by shooting on goal ($r = 0.752$, $p = 0.001 < 0.05$), the structure technique ($r = 0.670$, $p = 0.005 < 0.05$).

Table 8. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Passing the ball in a specific area (successful attempts) I.T. - Passing the ball in a specific area (successful attempts) F.T.	-2.063	0.574	0.143	-2.368	-1.757	-14.380	15	0.000
Pair 2	Diving the ball through cones followed by a shot on goal (seconds) I.T. - Diving the ball through cones followed by a shot on goal (seconds) F.T.	1.27000	0.14133	0.03533	1.19469	1.34531	35.945	15	0.000
Pair 3	Technical structure (seconds) I.T. - Technical structure (seconds) F.T.	1.71250	0.26093	0.06523	1.57346	1.85154	26.252	15	0.000

We performed the t-test for two paired samples in view of comparing the results obtained by the experimental group in the initial testing with the results obtained in the final testing. We ascertained a significant statistical difference for all samples:

passing the ball in a specific area (t = -14.380, p < 0.001),), driving the ball through cones followed by a shot on goal (t = 35.945, p < 0.001), technical structure (t = 26.252, p < 0.001).

Comparison between the control group - the experimental group

Table 9. Group Statistics

	Grupa	Mean	Std. Deviation	Std. Error Mean
Passing the ball in a specific area (successful attempts) I.T	Control group	1.94	0.680	0.170
	Experimental group	1.94	0.680	0.170
Passing the ball in a specific area (successful attempts) F.T.	Control group	3.06	0.574	0.143
	Experimental group	4.00	0.730	.0183
Diving the ball through cones followed by a shot on goal (seconds) I.T.	Control group	10.0894	0.34198	0.08550
	Experimental group	10.2038	0.18814	0.04704
Diving the ball through cones followed by a shot on goal (seconds) F.T.	Control group	9.1625	0.26720	0.06680
	Experimental group	8.9338	0.20899	0.05225
Technical structure (seconds) I.T.	Control group	11.3625	0.31353	0.07838
	Experimental group	11.4350	0.35096	0.08774
Technical structure (seconds) F.T.	Control group	10.3819	0.37057	0.09264
	Experimental group	9.7225	0.24648	00.06162

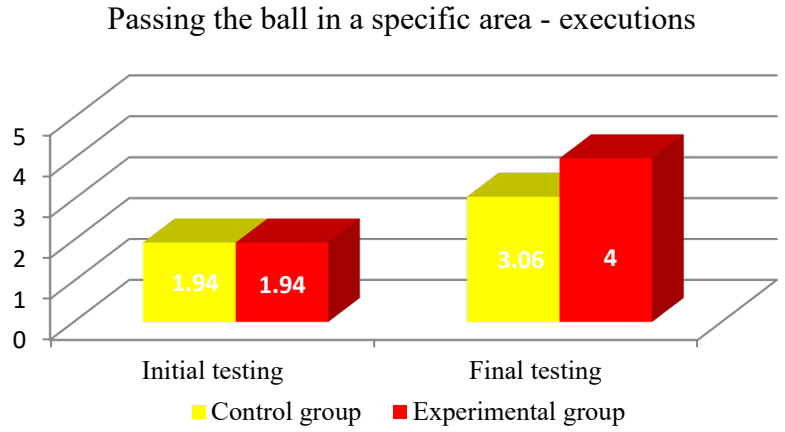
We compared the results obtained by the control group with those obtained by the experimental group on the 3 technical test for the initial testing and the final testing using the t-test for two independent samples.To be able to interpret this test, we determined the equality of variances using the Levene's test.

Table 10. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Passing the ball in a specific area (successful attempts) I.T	Equal variances assumed	0.000	1.000	0.000	30	1.000	0.000	0.240	-0.491	0.491
	Equal variances not assumed			0.000	30.000	1.000	0.000	0.240	-0.491	0.491

Passing the ball in a specific area (successful attempts) F.T.	Equal variances assumed	0.760	0.390	-4.038	30	0.000	-0.938	0.232	-1.412	-0.463
	Equal variances not assumed			-4.038	28.408	0.000	-0.938	0.232	-1.413	-0.462
Diving the ball through cones followed by a shot on goal (seconds) I.T.	Equal variances assumed	3.543	0.070	-1.172	30	0.250	-0.11438	0.09758	-0.31366	0.08491
	Equal variances not assumed			-1.172	23.318	0.253	-0.11438	0.09758	-0.31608	0.08733
Diving the ball through cones followed by a shot on goal (seconds) F.T.	Equal variances assumed	0.563	0.459	2.697	30	0.011	0.22875	0.08481	0.05555	0.40195
	Equal variances not assumed			2.697	28.355	0.012	0.22875	0.08481	0.05513	0.40237
Technical structure (seconds) I.T.	Equal variances assumed	0.102	0.751	-0.616	30	0.542	-0.0725	0.11765	-.31278	0.16778
	Equal variances not assumed			-0.616	29.626	0.542	-0.0725	0.11765	-.31291	0.16791
Technical structure (seconds) F.T.	Equal variances assumed	5.125	0.031	5.926	30	0.000	0.65937	0.11126	0.43214	0.88661
	Equal variances not assumed			5.926	26.100	0.000	0.65937	0.11126	0.43071	0.88804

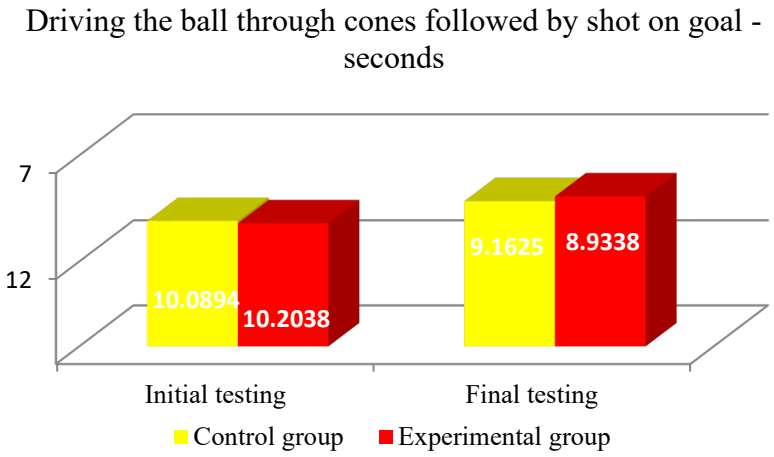
Test – Passing the ball in a specific area



Graph 1. Arithmetic mean for test one, initial and final testing

In the test of passing the ball in a specific area it was found that the differences were not statistically significant at the initial testing ($t = 0.000$, $p = 1.000 > \alpha = 0.05$, 95% CI (-0.491, 0.491)). There were statistically significant differences at the final testing ($t = -4.038$, $p < 0.001$, 95% CI (-1.412, -0.4634), difference between means = -0.938 – the higher mean value appearing in the experimental group).

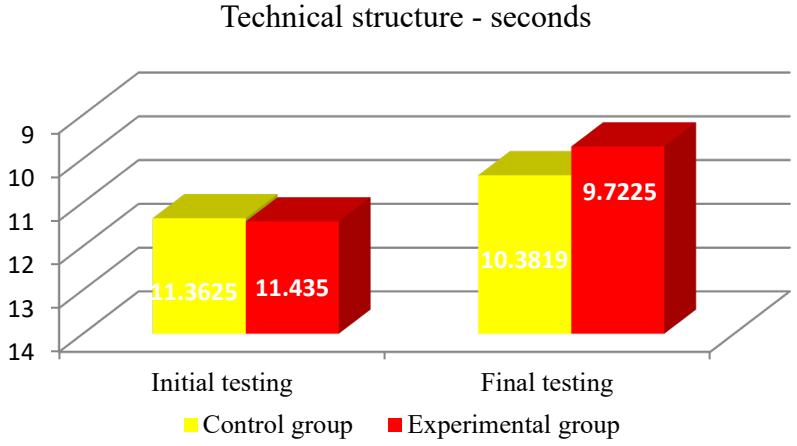
Test – Driving the ball through cones followed by shot on goal



Graph.2 Arithmetic mean for test two, initial and final testing

For the test of driving the ball through cones followed by a shot on goal (seconds) it turned out that the differences were not statistically significant at the initial testing ($t = -1.172$, $p = 0.250 > \alpha = 0.05$, 95% CI (-0.31366 , 0.08491)). There were statistically significant differences at the final testing ($t = 2.697$, $p = 0.011 < 0.05$, 95% CI (0.05555, 0.40195), difference between means = 0.22875 – a much improved mean value appearing in the case of the experimental group).

Test – Technical structure



Graph.3 Arithmetic mean for test three, initial and final testing

In the "technical structure" test, we concluded that the differences were not statistically significant at the initial testing ($t = -0.616$, $p = 0.542 > \alpha = 0.05$, 95% CI (-0.31278, 0.16778)). There were statistically significant differences in the case of the final testing ($t = 5.926$, $p < 0.001$, 95% CI (0.43071, 0.88804), difference between means = 0.65937 – a much improved mean value appeared in the experimental group).

Conclusions

Following the research carried out, we reached the following conclusions:

- The content of the training, centered on the player in relation to the ball and the direct opponent (1x1 duel) and the player in relation to the small group, teammates and opponents, used in the existing technical and material conditions in the school unit where the research activity was carried out contributed to consolidating the elements and technical procedures specific to the football game for the students who made up the secondary school football team.
- Players will be encouraged, educated and trained that, after winning the ball in a 1vs1 duel, they make the best decision to continue the attack in order to finish regardless of the technical procedure used.
- This way of training leads to the anticipation of future football trends, creates the correct framework and environment for the player's training as well as for the development of the ability to execute technical procedures.
- Dynamic technical training directs the process of consolidating technical elements and procedures. A good way to confirm the work done in a session

could be to repeat the session twice with the same objectives to keep and improve what was practiced, increasing the assimilation capacity of the desired objectives.

- Training must have progression in terms of the difficulty of the means as well as the number of players used in a drill.
- The students were pleasantly impressed by the drills as they had more touches of the ball, which led to an increase in the number of executions, having as a result the consolidation of the technical elements and procedures.
- The differentiated treatment of the students has an important role in achieving a maximum efficiency of the training program on the consolidation of the technical elements and procedures specific to the football game.
- It is the responsibility of the coach-teacher to be aware that students have different stages of development and training and it is his responsibility to know and understand each of these stages.
- The results obtained in all control samples ($p<0.05$) validate the training program.

References

[1] Aznar D., Juanes R., Dorado M., Gaspar F.,(2014), Advanced spanish academy coaching, Ed. SoccerTutor, pg. 132-138.

[2] Athanasios T., (2013), F.C. Barcelona training sessions, Edited by Alex Fitzgerald- SoccerTutor.com, pg. 26-30.

[3] Bichescu I. Andrade (2013) - Fotbal. Strategia instruirii in centrele de copii si juniori, Ed. de Vest, Timișoara, pg. 41-45.

[4] Gheorghiu, G., (2007), Metodologia cercetării în domeniul educației fizice și sportului, Editura Academica, Galați, pg.35-41.

[5] Grosu, B.,M., (2023), Study on the weight of technical elements without the ball to a senior football team in league III, The Annals of the "Ştefan cel Mare" University of Suceava, Physical Education and Sport Section, The Science and Art of Movement, pg. 46-52.

[6] Mazzantini M., Bombardieri S., (2013), Full season academy training program U13-U15, Edited by Alex Fitzgerald- SoccerTutor.com, pg. 34-35

[7] Mariman H., Berger H., Coolen L., (2015), Dutch academy footbal coaching (U12-13), Editura SoccerTutor, pg.47-49.

[8] Owen A., (2022), Football periodization, Edited by Alex Fitzgerald- SoccerTutor.com, pg. 41-58.

[9] Savu V.C., Moisescu P., (2017), Experiment on the improvement of the playing technique of,,C" juniors in the football game,,,Gymnasium''- Vol. XVIII, Issue 2, Bacau, pg.101-112.

[10] Simion G., (2020), The effects of using small-sided games on the development of endurance in elite youth football players (U17), Bulletin of the Transilvania University of Brasov Vol. 13(62) No. 1 –Series IX - Sciences of Human Kinetics, pg. 87-92.

[11] Teodor, D., F.,, Melenco, I., (2023), Development of young football players, Ovidius University Annals, Series Physical Education and Sport / Science, Movement And Health Vol. XXI, Issue 2 Supplement, 2023, pg. 413-416

[12] Valcarcel, E., (2018), Spanish football federation, Edited by Alex Fitzgerald- SoccerTutor.com, pg. 26-34

[13] https://www.frf.ro/wp-content/uploads/2021/06/Strategia-tehnica.pdf

[14] https://www.frf-ajf.ro/upload/cs/files/TESTE%20%20FIZICE%20%20JUNIORI.pdf