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THE EFFICIENCY OF THE OUTDOOR PHYSICAL EDUCATION LESSON IN THE SECONDARY SCHOOL BY APPLYING THE MEANS OF HANDBALL

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CONCEPTUAL GUIDELINES OF RESEARCH

Timeliness and importance of the problem addressed.

Physical education and sports activities nowadays know an unprecedented development, effectively and directly contributing to the formation and correct development of the personality. Sports activities exert remarkable influences in the direction of maintaining health, the biometric and spiritual potential of man.

The topic addressed is aimed at a current requirement, that of increasing the efficiency of the lesson, which, through the results obtained, contributes to increasing the physical education teacher's knowledge base. The problem of the effectiveness of the physical education lesson, of the general modernization of education, of all grades, is currently a requirement of our contemporary society, being a very topical concern in almost all countries of the world.

One of the tasks of physical education is to educate and motivate [15, 16] students to attend lessons, practice physical exercises and form the skills and organizational skills regarding the activity within the lessons. In order to have a pleasant physical activity during the classes and to have an extra motivation of the secondary school students, to work correctly, the relationship between the teacher and the student must be close and above all responsible in order to achieve the proposed objectives.

According to the opinion of several specialists in the field [9, 10, 28, 39, 45, 48], physical education and sports are important activities that are part of the lessons with a particularly increased role in: harmonious physical development, development of motor qualities, formation of skills and motor skills, maintaining a optimal conditions from the point of view of health. A particular concern of physical education specialists is to guide students to actively participate in recreational sports activities carried out in their free time [2, 22, 24, 25, 26].

The education system in Romania, which is constantly changing, aims to renew the instructional-educational process through a reform. The idea of the reform is based on the creation of objectives that lead to the development of the individual's personality proposed in legal documents [29, 30, 31, 32].

In order to achieve the objectives of physical education and sports, we must take into account the contents of school programs, calendar plans and learning unit designs. The contents include areas of organizing motor activities, harmonious physical development, motor capacities, sports disciplines, hygiene and individual protection measures, student behavior and attitudes in physical education and sports lessons.

The physical education lesson constitutes a pedagogical framework based on an organized didactic activity, led by a specialized teacher who imparts knowledge to the students, in order to acquire them. The accumulation of skills and abilities lead to the formation of skills and attitudes specific to the discipline of physical education. In physical education lessons [54, p.23-30] the use of interactive methods leads to stimulating the interest of students to perform physical exercises, increasing the efficiency of the lesson, increasing the motivation to learn and discover new acts and actions. According to the opinion of some authors, [36, 51] the lesson is considered the basic form

of the instructive-educational process of physical education, having in its composition contents that lead to the increase of the efficiency of the whole activity.

Compared to the other school lessons, the physical education lesson is distinguished by its content, structure, methodology, space and specific learning. Specific learning aims at educating motor skills, training motor skills and abilities, as well as practicing physical exercises. The physical exercise within the lessons is considered the most important basic means in the design of the instructional-educational process and in achieving the objectives of physical education. Leuciuc F. [21, p.11] tells us in his work, about physical exercise as a motor act that is carried out with the help of a muscle or a muscle group aiming to repeat the same movement several times. All innovations in education have strengthened the status of the lesson as the basic form of organizing the instructional-educational process.

The sports game handball [4, 11] represents a basic means of physical education through the motor actions carried out organized within the lessons. With its particularities, handball effectively contributes to the development of basic and specific motor qualities [23, 55, 56, 57], to the acquisition of motor skills, to the learning of knowledge related to technique and tactics, to learning teamwork, as well as to the development of the competitive sense, as and promoting fair play. The means in handball that aim to learn the activity of physical education are represented by physical exercises and technical-tactical exercises, simple or complex.

Due to the fact that the game of handball through its means leads to the achievement of the objectives of physical education, learning, consolidation and improvement must have the simplest, direct and effective way through which information is transmitted to students. In organizing the process of teaching handball in school at the secondary school level, emphasis must be placed on learning and consolidating the basic procedures and basic tactical actions, which can allow the practice of the game.

Using handball tools during the 50-minute lessons, an automation is observed on the part of the students regarding the correct execution of the skills specific to the game. Based on a consistent baggage, it is easy for students to complete the tasks during the lessons and achieve the proposed objectives: increasing the efficiency of the lesson and achieving the objectives of physical education.

The specialized literature [17, 18, 27, 42] offers us a multitude of means from handball with the role of optimizing the lesson regarding the achievement of physical education objectives, increasing the efficiency of the lesson, educating motor skills, training motor skills and skills, as well as practicing physical exercises.

The training of the students is carried out with the help of handball equipment adapted according to the venue, the particularities of age, physical development and the level of training with the aim of increasing the efficiency of the lesson.

Considering the previously presented, the topic addressed is topical and can provide informative support for physical education teachers who use handball tools in outdoor lessons with the aim of achieving increased efficiency.

Research hypothesis. If we use methods and means from handball to secondary school students, we will have the conviction that this sport is a basic means of physical education, with a special contribution in achieving the objectives of physical education such as the state of health, the creation of multiple skills and abilities, which are also doubled by an increased level of motor skills, and through the means and methods used, the efficiency of the outdoor lesson increases.

The **purpose of the research** consists in the elaboration and implementation of the model of application of the means specific to the game of handball at the level of the secondary school cycle, in the 7th grade, which leads to the increase of the efficiency of the physical education lesson and the achievement of the objectives of school physical education.

Research objectives. To achieve the given goal, the following objectives were formulated:

1. Analysis of specialized literature regarding the organization of the physical education process in secondary school.

2. Analysis of teachers' and students' opinion regarding the introduction of handball equipment in outdoor physical education lessons.

3. Elaboration of the model for the implementation of the means from the game of handball in the outdoor physical education lessons in the 7th grade.

4. Experimental argumentation of the effectiveness of the outdoor physical education lesson in the gymnasium by applying handball tools.

Scientific novelty and originality: it consists in the development and implementation of the model of application of the means specific to the game of handball, which used in outdoor physical education lessons leads to an increase in the efficiency of the lesson through the formation of motor skills and the development of the physical qualities of secondary school students.

The **current scientific problem solved** consists in the optimization of school planning by implementing the means of handball at the secondary school level in order to increase the efficiency of the outdoor physical education lesson.

The **theoretical significance** of the work indicates that by introducing the means from the game of handball, a high efficiency of the lesson was obtained, leading to the achievement of the objectives of physical education.

The **applicative value of the work** offers the possibility for physical education teachers to use handball tools in outdoor physical education lessons to make them more efficient. The obtained information can complete the theoretical and practical databases of the didactic process in physical education.

Implementation of scientific results. The research results were implemented in pre-university institutions in Romania and published in a series of national and international scientific conferences and symposia.

Potential scientific results estimated to be obtained. In order to increase the efficiency of the physical education lesson for secondary school students, we first of all propose to increase to an optimal level the pedagogical density of the lesson, which will lead to improvements in terms of motor and functional density. Thus, through the motor measurements that will be performed, an improvement in the motor skills and physical condition of the subjects will be seen. The positive

results obtained will be an impetus for the involvement of the subjects in the school sports teams that participate in the National School Sports Olympiad and possibly in performance sports at the junior level in the sports branches where the subjects are interested in practicing.

Research methodology. In order to organize the experiment on increasing the efficiency of the outdoor physical education lesson by implementing handball tools, we used the following research methods: the method of studying the specialized literature, the analysis of the planning data of the physical education activity, the pedagogical observation, the method of the pedagogical experiment (elaboration the hypothesis and its verification, the processing of the material with a view to the theoretical formation that can be established by verification: establishing the purpose, its organization, specifying the content with the indication of the procedures proposed for verification), the sociological method, the test method, the expert method, the statistical-mathematical method and the graphic method and tabular.

1. THE ORGANIZATION OF THE INSTRUCTIONAL-DIDACTIC PROCESS IN THE HIGH SCHOOL FOR THE DISCIPLINE "PHYSICAL EDUCATION"

(the basic content of Chapter 1)

Physical education and sports activities nowadays know an unprecedented development, effectively and directly contributing to the formation and correct development of the personality. Sports activities exert remarkable influences in the direction of maintaining health, the biometric and spiritual potential of man, leading to the physical development of the body.

Physical education, according to several specialists in the field [3, 7, 38, 53], is closely related to sports. Sport is the competitive activity carried out in an organized setting or not only, through which the totality of the forms of practicing physical exercises or dynamic games, individually or by a group, is used, in order to develop the individual from a motor point of view by overcoming their own records. Being part of general education, physical education has the role of contributing to the realization of the educational ideal and to the harmonious development of the personality.

From the perspective of several authors [30, 33, 35, 44, 46], due to its practical-applicative nature, physical education is one of the disciplines that can achieve the general objectives of education. Thus, it prepares children for a greater work capacity, develops the motor qualities specific to any activity, getting used to teamwork, respecting colleagues or opponents and forming some life principles. Rață G., [49, p.45] states that "physical education and sports contribute to the development of personality and represent the embodiment of the results of the use of material and spiritual values, i.e. necessary for the acquisition of knowledge, skills and the corresponding psychological characteristics".

With the introduction of physical education and sports in schools, physical exercise takes place in an organized setting. In social life, the role of sport becomes very important, and exercises are also practiced in free time by the different classes of the population [5, p.121].

Along with the other educational disciplines, physical education must contribute to the achievement of the highly responsible tasks facing the school. Participating directly in the multilateral development of students, well-organized physical education offers all the possibilities

for the harmonious development of their personality, for the strengthening of health and physical attributes, but also for the substantial increase of physical and moral forces. Physical education, through all the processes performed by the individual, establishes direct links with the biological side of individuality.

The discipline of physical education and sports is an important field for secondary school students. Through its presence in the curriculum where it benefits from two hours in the common core and an additional hour in the form of an optional, or sports ensemble, or additional hours for the preparation of the school's representative teams, it has gained an imposing status in this educational cycle. Several specialists [20, 37, 47, 50] in the field state that physical education is the discipline that deals with physical development, mental and moral development. Physical education is an important factor in personality development and in increasing the individual's physical and mental potential. This is an activity through which the individual manifests himself through various movements.

The contents of physical education and sports are very well defined in the school programs, for each cycle of study, with a view to achieving the fields of competences at the European level for compulsory general education in all the countries that are part of the European Union. Following these arguments, the school programs have formed general and specific competencies aimed at a new vision of teaching the discipline at this level of education. The Ministry of Education in school programs [34, p.2-43] introduced mandatory requirements regarding the teaching of certain contents regardless of the school unit and the conditions in which it carries out its instructional-educational process.

One of the most current problems of the physical education process is represented by the density of the lesson, being an important indicator in order to establish the quality and efficiency of the proposed activity. The density highlights the work time given to the student within the lesson by highlighting the parameters of effort, volume, intensity and complexity. In order to obtain an effective density, the teacher must know the level of effort in order to be able to take measures to increase or decrease it and to fulfill all methodical-organizational tasks [40].

Considering the amount of effort related to the actual work within the lesson we can say that the density plays a rather important role in determining the quality of the lesson. Depending on the quality and quantity of physical effort in correspondence with the duration of the physical education lesson motor density and pedagogical density are distinguished. In order to obtain an optimal density in the physical education lesson, there must be a correlation between the way the activity is organized and the student's working time [1, p.34-39].

The motor density is given by the ratio between the work done by the student (the time allocated for the execution of the exercises) and the effective duration of the lesson multiplied by 100. As stated by Cârstea G. [5, p.10] in the physical education lesson in which section strengthens motor skills, motor density prevails compared to activities where initiation is carried out.

Pedagogical density represents the ratio between the time allocated to the student who actively participates in explanations, demonstrations, organizational measures and the scheduled duration of the lesson, multiplied by 100. This density is most often found in learning lessons. The

close connection between intensity and complexity results in functional density. This density is achieved by the great functions of the human body during the lesson. Evaluation of F.C. at the beginning of the activity, during the lesson and at its end.

For students in our schools, almost every activity they participate in is a game, in which they develop their skills in an appropriate manner. In an environment invaded by the parents' rules, children cannot develop freely, taking into account the playful instinct and the desire to play, practicing an activity in which they rarely intervene, they are not sure what they are doing, they do not execute correctly, homework by own forces.

Using a dynamic game [14, p.5-39] in the activity at school, by combining the useful with the pleasant, the education process becomes much easier, more pleasant, more attractive and completes what the child lacks. By using the playful instinct we can stimulate students' creativity, courage, the desire to assert themselves, team cooperation, discipline, the spirit of fair play. In order to have a game, any didactic action must contain the competition, the reward, the waiting, the discovery along with a properly arranged space. Dynamic games [16, p.43-48] lead to the achievement and realization of the objectives of physical education and sports through the development of motor skills and abilities, the development of motor qualities. These dynamic activities increase students' desire to practice physical exercise.

Handball is a sports game accessible to all students because most of the technical procedures are performed by hand, the rules of the game are simple and easy to implement, the material conditions necessary to play the game are not expensive, the elements used are shapes natural human motor acts, talking about running, jumping, throwing, catching, the ball used is smaller than in other sports and can be handled easily. According to the regulation, [13, p.10] a team is composed of 12 players. On the field of play there will be 7 players, 6 outfield players and a goalkeeper.

Important aspects of the activity of the teacher, as well as of the student, are given by the achievement of the goals of physical education to which handball also contributes, the existence of a plan for each year of study, the use of suitable action systems for each class depending on the level of preparation of the students. Considering the previously mentioned aspects, the teacher must take into account all the appropriate measures for a good organization and conduct of the lesson leading the teaching process specific to handball. He must be careful in choosing the actuation systems during the lesson, so that the student understands what he has to do by adopting an appropriate attitude.

Having 12 years of experience as a teacher of physical education and sports, I can specify some advantages in order to practice the game of handball in outdoor lessons:

- it is a sport accessible to all students, both for girls and boys, regardless of the level of training;
- the pleasure of practicing this sport in an environment favorable to physical development, without risk of injury;
- immediate effect of joy after scoring a goal;

- the playing field for handball can be easily adapted, depending on the available space and the number of participants (4x4, 5x5, 7x7);
- the rules are simple, the materials are few or improvised (scoring equipment, balls made of other materials or from other sports, the goalposts made of stakes or drawn on the wall);
- practicing this sport in the open air where the student is in permanent contact with hardening factors (water, air, sun). As disadvantages for the game of handball would be: the lack of interest and training in the secrets of the game among the students, the lack of knowledge of the advantages of practicing this sport, or the non-popularization of handball in the classes, because the school does not have a playing field, there is no training among the teachers.

According to the school curriculum [34, p.2-43] for the discipline of physical education and sports at the gymnasium level, handball in the 5th grade, the 1st year of training has the following contents:

- elements and procedures in attack and defense: the pass thrown with one hand above the shoulder, the catch with two hands, simple dribbling, the shot at the goal from the spot, from the distance with added steps, with crossed steps, the fundamental position;
- procedures specific to the goalkeeper - putting the ball back by the goalkeeper;
- individual and collective technical-tactical actions: overcoming, retreating, marking and demarcation, interception, attack system in a semi-circle, defensive positioning in the 6:0 system;
- theme game variants;
- knowledge of the rules of the game: steps, foul, double dribbling;
- sports information.

In the 6th grade, the first year of training is the same content as in the 5th grade, and in the second year of training, in addition to the previously covered content, we also add:

- elements and procedures in attack and defense: one-handed pass from the shoulder, from the spot and from the distance, multiple dribbling, the throw from 7 meters, the throw at the goal from the jump, specific movements in fundamental position;
- individual and collective technical-tactical actions: blocking balls thrown towards the goal, marking the opponent with or without the ball, demarcation, attack system with a pivot, direct counterattack, with an intermediary;
- knowledge of the rules of the game: defending in the semicircle, attacking the semicircle, foot;
- sports information.

The contents of the 7th grade school curriculum are the same as those covered in the previous middle school grades with an emphasis on their consolidation.

In the 8th grade, the 3rd year of training, we have the following content areas:

- technical-tactical actions specific to the known attack system;
- technical-tactical actions specific to the known defense system;
- variants of the game with a theme, of the game with a reduced effect;
- the integration of technical-tactical actions in the bilateral game;
- knowledge of refereeing, organization and management of the handball game;

- sports information.

The totality of actions specific to the game of handball that allows the player to take possession of the ball, handle it and pass it when the game situation allows is represented by the technique [19, p.125]. According to some authors [8, 43], the technique is in a continuous development which shows that in the future it will develop through the progress of craftsmanship. The technical elements of catching, passing, driving and throwing must be repeated in an organized way to become habitual movements of the players, automatisms that are introduced into tactical actions of attack and defense specific to the game of handball. Several specialists in the field [6, 41] specify that the main components of the technique are the technical elements and procedures.

Game systems in the game of handball are used according to the preparation of each team, different offensive and defensive organizations. Systems and forms of play used in defense can be found in the following form: zone defense, man-to-man and combined defense. In attack we encounter playing systems with one pivot or two pivots.

In order to prepare the students who play handball in the representative team of the school, we must take into account the objectives of physical, tactical, psychological and theoretical training.

Following the detailed analysis of the physical education lesson, we can state that the optimal links where you can introduce the means specific to the handball game that aim to increase efficiency are 4, 5 and 6. The most effective work procedures used within these thematic links were the frontal and pairwise procedure. We believe that, by implementing the model that contains means specific to the game of handball, the problem of the effectiveness of the outdoor sports and physical education lesson will be solved.

2. DEVELOPING THE METHODOLOGY FOR IMPLEMENTATION OF HANDBALL TOOLS WITHIN OUTDOOR PHYSICAL EDUCATION LESSONS

(the basic content of Chapter 2)

The subjects who participated in this research were divided into two categories: secondary school students from several schools, who were surveyed through the sociological survey with the objective of assessing the motivation regarding attending physical education and sports classes, in a number of 652 students respectively, 345 boys and 306 girls and students who were part of the experimental group composed of the experimental class from the "Iorgu Vârnav Liteanu" Technological High School" in the city of Liteni and the control class from the "Aurelian Stanciu" Secondary School in the city of Salcea, Suceava county, Romania. The experiment 7th grade (CE) consisted of 21 students, 10 girls and 11 boys, and the control 7th grade (CM) consisted of 19 students, 10 girls and 9 boys. During the 2019-2020 school year in which the research was carried out, the experimental class carried out activities according to a special training plan, while the control class carried out activities within the lessons according to the existing curriculum developed by the Ministry of National Education [34, p.2- 43]. In both classes participating in the research, we developed a single action content plan within the physical education lessons. In order to increase the efficiency of the physical education and sports lesson, in the experimental class the action contents were realized differently compared to the control class.

The scientific research was carried out over the period of four calendar school years in the following order:

The first period was carried out during the 2017-2018 school year in which the study of the specialized bibliography and the analysis of the works, both from the country and abroad, the study of the school curriculum, the education plan, the school programs and the analysis of the methods and means of handball used in outdoor physical education lessons.

During the 2018-2019 school year, I continued the individual study of the bibliography and specialized works, creating a research plan following the documentation. Also in the same period, we obtained feedback from the students regarding their motivation for the activities they carry out in the physical education and sports lesson and from the teachers at the department with reference to the possibility of increasing the efficiency of the lesson by introducing some means from handball into the contents of teaching to secondary school students, I carried out a confirmatory study on the initial level of development and physical training of students in the 7th grade and I developed the pedagogical model for the implementation of handball tools in physical education and air sports lessons free.

The third period was during the 2019-2020 school year where I organized and conducted the experiment on the topic of the doctoral thesis. This period was one of practical work where we applied tests specific to the game of handball, motor training and somatic development to both the experimental group and the control group. In addition to the practical part, we analyzed and compared the results obtained in the two tests. We have developed final conclusions and recommendations for achieving better effectiveness in outdoor physical education lessons. The pedagogical experiment was carried out in two 7th classes, the experimental class and the control class, in the 2019-2020 school year, in the first semester, September - November. According to order no. 4135 of April 21, 2020, elaborated by the M.E.C., regarding the instructions for the learning process at the level of the pre-university education system, the courses held on-site are transformed at the level of the country of Romania into online courses until the end of the school year. During the online activities, the students who were part of the experiment class received materials in word, ppt, video format with reference to the game of handball: rules of the game, tools specific to the game of handball, exercises for the development of motor skills.

The 2020-2021 school year was the final year of the research where I achieved the following objectives: the interpretation of the results obtained by the experimental and control classes following the initial and final tests, the creation of tables, the graphic representation of the data and the elaboration of the structure of the final work according to the current requirements.

One of the tasks of physical education is to educate and motivate students to attend lessons, practice physical exercises and form the skills and organizational skills regarding the activity within the lessons. In order to have a pleasant physical activity during the classes and to have an extra motivation of the secondary school students, to work correctly, the relationship between the teacher and the student must be close and above all responsible in order to achieve the proposed objectives. Simion, Gh. Amzar, L. [52, p.26-27] says that "The elaboration of the questionnaire always starts from the establishment of the specific objective by which its evaluation is aimed. This principle

constitutes the point of reference in the approach of the elaboration of the questionnaire, then follows a question that refers to how the answer will be analyzed."

For a good organization of the study, we established several stages of research: establishing the purpose, organizing the sample of students to whom the questionnaire is applied, preparing the material for the survey, conducting the survey, processing and interpreting the results, and drawing up conclusions and recommendations.

The assessment of the motivation regarding attending outdoor physical education classes was known through the investigation of 652 secondary school students, 345 boys and 306 girls from the Technological High School "Iorgu Vârnav Liteanu" - Liteni city, Roșcani High School - Liteni city, High School "Aurelian Stanciu" - Salcea city, Verești Secondary School - Verești commune and "Hatmanul Șendrea" Secondary School - Dolhești commune. We used the motivation study survey, where the questionnaire (Appendix 1) contained 9 questions regarding the activity in the physical education classes and 3 questions containing information about the students. 156 5th grade students, 143 6th grade students, 181 7th grade students, and 181 8th grade students participated in this survey.

Following the survey of secondary school students, we found that 87% of them come to school with love, 78.8% are not happy when the lesson is canceled and 94.1% are happy to come to school if the first class is physical education. When asked what sport they like to practice in physical education classes, 207 students said they love handball. As a final conclusion, the surveyed students like the activities in physical education classes and actively participate in them.

In order to obtain a complete answer on the topic addressed, we also asked for the opinion of the specialists. Therefore, during the 2018-2019 school year, we conducted a survey of 71 physical education and sports teachers from Romania through an online questionnaire, in order to find out their opinion regarding the students' interest in physical education lessons, the difficulties they face teaching staff in this process, their assessment of the students' training level, the degree of use of handball tools in the activities and the level of efficiency in order to implement these tools. 47 male and 24 female teachers participated in the survey. The questionnaire (Appendix 2) was created with the help of the www.docs.google.com program, and sent by email to all teachers who participated in the survey. The answer to the questionnaire was also sent by email.

The analysis of the opinion of the physical education and sports teachers regarding the activity they carry out during the lessons, allows us to conclude that their attitude, as well as the methods and means used in the physical education lessons, have an important impact on the students' behavior regarding class attendance. If the model of means from the handball game will be implemented in the thematic links within physical education lessons, 43.7% believe that it will increase the effectiveness of the lesson. In other words, most teachers use means from the game of handball in the activities they carry out at school. These means develop the individual's ability to work in a team, the development of motor qualities and skills.

In order to obtain some informative values regarding the degree of physical development, as well as the physical training of the students in the secondary school, from the 7th grade, we carried out a constitutive study consisting of 308 students, 146 girls and 162 boys, where the results

obtained were compared with the minimum and maximum performance standards presented in the National School Evaluation System in the discipline of physical education and sport, and the results of the anthropometric measurements were compared with the values of the researcher M. Epuran [12], entered in his paper, Methodology of the research of bodily activities. So, during the period of the ascertainment study, the indicators used to evaluate somatic parameters were height (cm), body weight (kg) and B.M.I. To identify the values regarding physical training, the students performed the following tests: standing long jump (cm), trunk lifts - girls (rep. no.), leg lifts - boys (rep. no.), push-ups (no. rep.), balance (s), shot put (m), sprint – 50m (s) and endurance run – 800m – girls, 1000m – boys (min.).

The national evaluation system provides minimum scales for grade 5 and maximum grades for grade 10 that will be compared with the results obtained by the students included in the ascertainment study.

The data obtained are centralized in Table 2.1. and graphically represented for interpretation.

Table 2.1 The results obtained in the confirmatory experiment

No. crt.	Measurements/ Test	Girls (n=146)		Boys (n=162)	
		Standard min./max.	Sample X±m	Standard min./max.	Sample X±m
1.	Height	147,9 - 161,9	**159,74±0,55**	145,5 - 162,5	**161,15±0,60**
2.	Body weight	36,3 - 52,7	**46,14±0,58**	34,2 - 50	**45,65±0,54**
3.	BMI	18,49 - 29,99	**17,86±0,19**	18,49 - 29,99	**17,59±0,18**
4.	Long jump	140 - 160	**136,48±1,37**	160 - 180	**166,01±0,91**
5.	Trunk lifts	16 - 24	**21,65±0,34**		
6.	Leg lifts			12 - 20	**9,42±0,24**
7.	Pushups	4 - 11	**10,69±0,24**	6 - 13	**8,71±0,21**
8.	Balance		**21,57±0,43**		**25,91±0,64**
9.	Throwing the wiffle ball bat	14 - 26	**20,31±0,26**	22 - 32	**25,48±0,30**
10.	Speed running	9,4 - 8,7	**9,32±0,03**	8,4 - 7,9	**8,07±0,03**
11.	Endurance running	4,55 - 4,20	**4,07±0,03**	4,55 - 4,10	**4,45±0,02**

The results obtained by the sample of 7th grade students provided us with useful information about somatic development and the level of general motor training, constituting a starting point for the pedagogical experiment. The data recorded regarding the anthropometric profile of the 7th grade secondary school student, show us that they are underweight, both in girls and in boys. In the motor tests according to the national evaluation system, we are at an average level, grade 7.

In conclusion, we believe that it is necessary to introduce a program that contains specific means for physical development and a sports game. In addition to physical exercise, we recommend a healthy diet.

Capitalizing on the existing information in the school curriculum in force, adapted to the characteristics of the secondary school cycle, we have created a specific planning for the sports game whose objective is to increase the efficiency of the physical education lesson by implementing some means from outdoor handball. The game of handball, like the other sports games, is a means of consolidating/improving the preparation of children from a somatic, motor and mental point of view, with the aim of achieving the objectives of physical education. Through the diversified implementation of handball tools in outdoor lessons, we will increase the efficiency of the teaching process that leads to an increase in motor density, the attractiveness among students to practice a sports game with interest and the achievement of progress that determines the achievement of better results.

In order to achieve the objective proposed in the paper, a set of measures will be strictly used with the aim of achieving general and specific skills. From my own experience, I can say that the means of the handball game have a special attraction among students, because it is a sport that is accessible to everyone, has simple rules and can be practiced by anyone, anywhere. Moreover, as a means of physical education, handball aims at the development of qualities and the formation of motor skills, and as a method, it aims at learning the game as a sporting test.

Starting from the idea of increasing efficiency, we will approach the outdoor physical education lesson, without changing its organization, with the specification of the implementation of diversified means within the thematic links. Within these thematic links, exercises aimed at the development of motor skills, the formation of skills specific to the game of handball, harmonious physical development and the increase of general motor skills will be introduced to the experiment class. The 4th link is specific to the motor qualities of speed and skill, and the 6th link to endurance and strength. The contents that make up the fifth link are related to motor skills. In the lesson, I opted for the approach with two main themes, one about a motor quality, and the other about the game of handball. In order to carry out the research, we developed the model for the implementation of handball mids in physical education and outdoor sports lessons. This design was made based on didactic principles that ensure an effective didactic process containing exercises, means and material resources, achieving the objectives of physical education. Within these means, particular learning paths have been used that lead to an increase in the effectiveness of the lesson. After conducting the confirmatory study, which was very helpful and provided us with valuable information regarding the level of somatic and motor development of the students, we developed the model for the implementation of the handball tools and the design of the learning units.

The planning of the activities proposed by us respects the school curriculum in force and the principles of elaboration according to the specialized literature. The model implemented in the 7th grade physical education and sports lessons held outdoors includes means of developing motor skills in accordance with means specific to the game of handball that ensure increased efficiency.

Given that there are only two hours a week in the 7th grade and the experiment took place over a period of 12 weeks, I was forced to use the most efficient means to achieve progress.

So, six lessons were allocated for the development of motor quality speed, five lessons for the development of skill, six for the development of strength and four for the development of endurance. We find within the proposed planning seven lessons to strengthen the fundamental position in defense and attack, six lessons to strengthen holding, catching and passing the ball, eight lessons to strengthen dribbling and shooting at goal and five lessons to learn/consolidate marking/marking, intercepting the ball , shot blocking, passing and deceptive moves. They were used to capture attention and increase attractiveness dynamic games. It should also be noted that each lesson was completed with bilateral play.

Table 2.2. Pedagogical model of staggering the contents of handball in the experimental class (24 hrs)

Learning unit	month	September						October										November							
	week	1		2		3		4		5		6		7		8		9		10		11		12	
	lesson	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Health and physical development	Physical development exercise complex	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
	Theoretical knowledge	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Motor qualities	Speed			$V_{1,2,3}$	$V_{4,5}$	$V_{6,7}$	V_8	V_9	V_{10}																
	Skills									$I_{1,2,3}$	$I_{4,5,6}$	$I_{7,8}$	I_9	I_{10}											
	Strength														F_1	$F_{2,3}$	F_4	$F_{5,6}$	$F_{7,8}$	$F_{9,10}$					
	Resistance																			R_1	R_2	R_3	R_4		
Locomotion skills	Walking	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
	Running	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
	Jump	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Handball sports game	The fundamental position			$P.f._1$ $P.f._2$ $P.f._3$	$P.f._4$ $P.f._5$	$P.f._6$ $P.f._7$	$P.f._8$ $P.f._9$	$P.f._{10}$ $P.f._{11}$	$P.f._{12}$ $P.f._{13}$	$P.f._{14}$ $P.f._{15}$															
	Moving in the field			$D.t._1$ $D.t._2$ $D.t._3$	$D.t._4$ $D.t._5$	$D.t._6$ $D.t._7$	$D.t._8$ $D.t._9$	$D.t._{10}$ $D.t._{11}$	$D.t._{12}$ $D.t._{13}$	$D.t._{14}$ $D.t._{15}$															
	Holding, catching and passing the ball				$P.m._1$ $P.m._2$ $P.m._3$	$P.m._4$ $P.m._5$ $P.m._6$ $P.m._7$	$P.m._8$ $P.m._9$	$P.m._{10}$ $P.m._{11}$	$P.m._{12}$ $P.m._{13}$	$P.m._{14}$ $P.m._{15}$															
	Dribbling										$D._1$ $D._2$ $D._3$	$D._4$	$D._5$ $D._6$	$D._7$ $D._8$	$D._9$ $D._{10}$	$D._{11}$	$D._{12}$ $D._{13}$	$D._{14}$ $D._{15}$							
	Goal kick										$A.p._1$ $A.p._2$ $A.p._3$	$A.p._4$ $A.p._5$	$A.p._6$ $A.p._7$	$A.p._8$ $A.p._9$	$A.p._{10}$ $A.p._{11}$	$A.p._{12}$ $A.p._{13}$	$A.p._{14}$	$A.p._{15}$							
	The marking, the demarcation																		$M.dm_1$	$M.dm_2$	$M.dm_3$	$M.dm_4$	$M.dm_5$		
	Interception of the ball and blocking of throws																		$In.m._1$	$In.m._2$	$In.m._3$	$Bl.a._1$	$Bl.a._2$		
	Overtaking and deceptive moves																		$Dep._1$	$Dep._2$	$Dep._3$	$Mî._1$	$Mî._2$		
	Bilateral game	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Dynamic games				$J.d._{12}$	$J.d._{3}$	$J.d._{4}$	$J.d._{5}$	$J.d._{6}$	$J.d._{7}$	$J.d._{8}$	$J.d._{9}$	$J.d._{10}$	$J.d._{11}$	$J.d._{12}$	$J.d._{13,14}$	$J.d._{15}$	$J.d._{16}$	$J.d._{17}$	$J.d._{18}$	$J.d._{19}$	$J.d._{20}$	$J.d._{21}$	$J.d._{22}$		

The phasing of the learning contents is presented in Table 2.2 and was intended to summarize the activity during the 12 weeks. It can be noted that the first and last two lessons were reserved for the initial and final tests, and each lesson had in its structure means specific to the game of handball for the development of a motor quality and the consolidation of technical procedures in handball.

The contents of the control class from the annual planning was carried out according to the current curriculum using exercises in order to achieve the objectives of physical education. In the composition of the lessons, two or three themes were selected that include means for developing motor skills, learning motor skills and strengthening the technical elements of sports games. Moreover, or created lessons with different themes, such as: motor quality/athletics, motor quality/sports game, acrobatic gymnastics, sports games (handball, football, volleyball).

The didactic activity from the experiment class was oriented towards the use of the means from the handball game in the outdoor physical education lessons, with the aim of increasing efficiency.

The learning contents of the pedagogical model proposed in the experiment class consisted of exercises specific to the game of handball aimed at the development of motor skills and means aimed at strengthening the elements and technical procedures in handball.

Considering the fact that the experiment took place between September and November, we must also take into account the weather conditions. In Romania, during this interval, the weather can undergo temperature changes due to the transition from summer to autumn. Moreover, our research being carried out in the open air, it can also be disturbed by rainy weather. So, in unfavorable conditions, our activity in the experiment class can be carried out respecting the contents of the activity for that day, reorganizing ourselves from the point of view of the equipment, taking into account one of the objectives of physical education, that of maintaining an optimal state of health, as follows:

- low temperatures - students will use appropriate equipment consisting of sneakers, tracksuit (long pants, long-sleeved blouse), waterproof t-shirt, hat, gloves;
- rainy weather - if the rain is not abundant, work can be done, students using a waterproof jacket;
- if temperatures are below 5 degrees or heavy rain, the activity can be suspended and rescheduled later.

Considering the previously mentioned, our activity being carried out outdoors, in the first week of November, the weather was less favorable, with temperatures between 5 and 10 degrees. Therefore, the equipment of the students underwent changes, by introducing a thicker tracksuit, waterproof jacket and gloves, and the complexity of the means used in the lessons was less.

In another vein, in addition to the development of motor skills, this period contributes to the development of students from the point of view of immunity, practicing physical exercise under special conditions.

3. EXPERIMENTAL VERIFICATION AND ARGUMENTATION ON INCREASING THE EFFICIENCY OF THE OUTDOOR PHYSICAL EDUCATION LESSON THROUGH THE APPLICATION OF HANDBALL MEANS

(the basic content of Chapter 3)

In order to increase the efficiency of the outdoor physical education lesson in the secondary school by applying the means of handball, the main objective of the pedagogical experiment was to verify the hypothesis of the work. Following the questionnaire applied to secondary school students, we found that most of them are motivated to participate in physical education and sports class, so two 7th graders were designated to participate in the experiment.

The experimental class from the "Iorgu Vârnav Liteanu" Technological High School in the city of Liteni is composed of 10 girls and 11 boys who, during the research, carried out activities according to a specially created plan with means from handball.

The control class from the "Aurelian Stanciu" Secondary School, Salcea city with a total of 19 students, 10 girls and 9 boys, completed activities in accordance with the curriculum specific to the training level.

The experiment took place during the 2019-2020 school year, and the students completed several control tests. The objective of testing the students was to ascertain and highlight the evolution of the previously established groups of students, from the point of view specific to the game of handball, motor and somatic. Between September and November, students from the experimental class benefited from outdoor physical education and sports lessons with an emphasis on means specific to the game of handball. After the tests, the students' progress or regression can be observed, as a result the results obtained were centralized, processed statistically and compared to each other in both classes.

Table 3.1. Intergroup and intragroup analysis of statistical indicators for handball-specific tests of students from experimental and control classes, girls, at initial and final testing (n=20)

No. crt.	Specific testing	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Dribbling in a straight line 30 m	CE	9,25±0,21	7,94±0,32	3,45	<0,01
		CM	9,49±0,20	9,15±0,20	1,18	>0,05
		t	0,85	3,22	-	-
		P	>0,05	<0,01	-	-
2.	Dribbling between the posts 30 m	CE	12,25±0,23	9,94±0,37	5,36	<0,001
		CM	12,42±0,39	11,97±0,44	0,77	>0,05
		t	0,38	3,54	-	-
		P	>0,05	<0,01	-	-
3.	Throwing the handball with momentum	CE	14,80±0,53	24,20±0,83	9,54	<0,001
		CM	13,09±0,43	14,90±0,43	1,63	>0,05
		t	1,30	9,55	-	-
		P	>0,05	<0,001	-	-
4.	Movement in the triangle	CE	17,24±0,14	13,85±0,20	14,12	<0,001
		CM	17,51±0,14	17,10±0,19	1,72	>0,05
		t	1,39	11,94	-	-
		P	>0,05	<0,001	-	-
5.	Structure no. 1	CE	6,85±0,11	8,90±0,15	13,37	<0,001
		CM	6,90±0,07	7,00±0,07	1,34	>0,05
		t	0,39	11,63	-	-
		P	>0,05	<0,001	-	-
6.	Structure no. 2	CE	6,55±0,16	9,15±0,17	11,31	<0,001
		CM	6,75±0,11	6,95±0,05	1,63	>0,05
		t	1,03	12,58	-	-
		P	>0,05	<0,001	-	-
7.	Structure no. 3	CE	6,50±0,15	8,95±0,16	11,30	<0,001
		CM	6,45±0,14	6,85±0,08	2,52	<0,01
		t	0,24	12,01	-	-
		P	>0,05	<0,001	-	-
8.	Bilateral game	CE	6,20±0,13	8,70±0,17	11,57	<0,001
		CM	6,15±0,08	7,10±0,07	9,37	<0,001
		t	0,32	8,76	-	-
		P	>0,05	<0,001	-	-

Note: CE – Experimental class, n= 10; CM – Control class, n= 10.

P – 0,05; 0,01; 0,001

f= 9; t = 1,734 2,552 3,610

f= 18; t = 2,100 2,878 3,921

The technical tests specific to the game of handball were carried out during the 2019-2020 school year in September, the initial testing and in November the final testing, both in the experimental group and in the control group. To appreciate the specific procedures of the game, we used the following tests: dribbling in a straight line 30 m, dribbling between the posts 30 m, throwing the handball with a 3-step swing, moving in a triangle, 3 technical-tactical structures and bilateral play.

Considering the results obtained by the subjects involved in the research in the first four tests specific to the game of handball, it can be stated that it was an objective grading based on the real performances of girls and boys from both classes. In the other samples included in the experimental study, we notice a dose of subjectivism, because the grading was done based on the application of grades that led to progress or regression.

The progress recorded by the experimental group in the handball specific tests confirmed the effectiveness of the means used during physical education and sports lessons. These means led to the achievement of physical education objectives, to the development of motor skills and to the consolidation of skills specific to the game of handball.

Table 3.2. Intergroup and intragroup analysis of statistical indicators for tests specific to the handball game of students from the experimental and control classes, boys, at the initial and final testing (n=20)

No. crt.	Specific testing	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Dribbling in a straight line 30 m	CE	7,73±0,23	6,87±0,27	2,39	<0,05
		CM	8,04±0,15	7,81±0,15	1,08	>0,05
		t	1,08	2,81	-	-
		P	>0,05	<0,05	-	-
2.	Dribbling between the posts 30 m	CE	9,42±0,20	8,33±0,18	4,11	<0,001
		CM	9,66±0,14	9,42±0,15	1,19	>0,05
		t	0,93	4,16	-	-
		P	>0,05	<0,01	-	-
3.	Throwing the handball with momentum	CE	23,09±0,73	32,55±1,09	7,20	<0,001
		CM	21,22±0,74	22,67±0,71	1,60	>0,05
		t	1,77	7,22	-	-
		P	>0,05	<0,001	-	-
4.	Movement in the triangle	CE	16,78±0,19	13,62±0,28	9,34	<0,001
		CM	17,13±0,12	16,92±0,14	1,16	>0,05
		t	1,44	9,88	-	-
		P	>0,05	<0,001	-	-
5.	Structure no. 1	CE	7,18±0,12	9,18±0,16	10,14	<0,001
		CM	7,00±0,00	7,50±0,14	3,46	<0,01
		t	1,34	7,80	-	-
		P	>0,05	<0,001	-	-
6.	Structure no. 2	CE	6,91±0,09	8,23±0,17	6,83	<0,001
		CM	6,67±0,14	6,94±0,10	1,58	>0,05
		t	1,47	6,12	-	-
		P	>0,05	<0,001	-	-
7.	Structure no. 3	CE	6,73±0,12	8,95±0,08	15,05	<0,001
		CM	6,83±0,12	7,06±0,06	1,70	>0,05
		t	0,61	18,39	-	-
		P	>0,05	<0,001	-	-

8.	Bilateral game	CE	6,82±0,14	9,14±0,20	9,40	<0,001
		CM	7,06±0,06	7,50±0,14	2,87	<0,01
		t	1,45	6,28	-	-
		P	>0,05	<0,001	-	-

Note: CE – Experimental class, n= 11; CM – Control class, n= 9.
P – 0,05; 0,01; 0,001
f= 10; t = 1,724 2,527 3,551
f= 8; t = 1,745 2,583 3,686
f= 18; t = 2,100 2,878 3,921

The control samples specific to the game of handball helped us to identify the progress or regression of the results of the students involved in the research [240]. By analyzing the results obtained (Annex 6) we consider that the specific means implemented in the pedagogical model were effective.

Along with the technical tests specific to the handball game, the motor development tests were also carried out. The motor tests used in the research are included in the Evaluation and Examination System for the discipline of physical education and sport in Romania in close connection with the Capacity Test developed by the International Federation of Physical Education. The tests on physical motor development were carried out during the 2019-2020 school year, in September the initial test and at the end of November the final test, both in the experimental group and in the control group (Appendix 7).

Table 3.3. Intragroup and intergroup analysis of statistical indicators for the motor tests of students from the experimental and control classes, girls, at the initial and final testing (n=20)

No. crt.	Motor tests	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Sprint 30m(s)	CE	6,98±0,06	5,78±0,15	7,39	<0,001
		CM	6,98±0,15	6,89±0,15	0,46	>0,05
		t	0,26	5,50	-	-
		P	>0,05	<0,001	-	-
2.	Shuttle 5x10m(s)	CE	17,13±0,11	15,25±0,14	10,29	<0,001
		CM	17,30±0,20	17,13±0,21	0,60	>0,05
		t	0,95	7,97	-	-
		P	>0,05	<0,001	-	-
3.	Standing long jump(m)	CE	1,49±0,07	1,73±0,04	3,04	<0,01
		CM	1,46±0,04	1,56±0,04	1,67	>0,05
		t	0,47	3,36	-	-
		P	>0,05	<0,01	-	-
4.	Push-ups(no.)	CE	8,20±1,08	14,10±1,21	3,63	<0,001
		CM	8,56±0,97	10,44±0,91	1,57	>0,05
		t	0,00	2,63	-	-
		P	>0,05	<0,05	-	-

Note: CE – Experimental class, n= 10; CM – Control class, n= 10.
P – 0,05; 0,01; 0,001
f= 9; t = 1,734 2,552 3,610
f= 18; t = 2,100 2,878 3,921

Table 3.4. Intragroup and intergroup analysis of statistical indicators for the motor tests of students from the experimental and control classes, boys, at the initial and final testing (n=20)

No. crt.	Motor tests	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Sprint 30m(s)	CE	7,29±0,11	5,99±0,18	6,13	<0,001
		CM	7,50±0,12	7,41±0,11	0,52	>0,05
		t	1,27	6,27	-	-
		P	>0,05	<0,001	-	-
2.	Shuttle 5x10m(s)	CE	17,99±0,11	14,55±0,30	8,48	<0,001
		CM	17,68±0,15	17,46±0,15	1,05	>0,05
		t	0,91	8,18	-	-
		P	>0,05	<0,001	-	-
3.	Standing long jump(m)	CE	1,45±0,07	1,74±0,06	2,57	<0,01
		CM	1,45±0,05	1,53±0,05	1,17	>0,05
		t	0,01	2,64	-	-
		P	>0,05	<0,05	-	-
4.	Push-ups(no.)	CE	11,55±0,67	15,91±0,56	5	<0,001
		CM	11,44±0,53	12,56±0,50	1,52	>0,05
		t	0,11	4,34	-	-
		P	>0,05	<0,001	-	-

Note: CE – Experimental class, n= 11; CM – Control class, n= 9.

	P – 0,05;	0,01;	0,001
f= 10;	t = 1,724	2,527	3,551
f= 8;	t = 1,745	2,583	3,686
f= 18;	t = 2,100	2,878	3,921

From the research carried out, it is evident that the means used in the physical education and sports lessons in the experimental class brought a positive contribution in terms of the development of motor skills and in order to increase the efficiency, the motor density in the lesson. Moreover, we note the progressive results, both in girls and in boys, in all the tests performed at the end of the proposed period, in the final testing, for all 4 samples included in the experiment. Going by the close results in the initial testing, only the experiment class gets the result we expected. The poor results from the control class indicate the lack of effective exercises performed in physical education classes.

The harmony of the correct physical development of the secondary school student is given by the proportionality of the somatic indices, with particular importance the weight and body height indices.

Knowing the level of somatic development of the students involved in the research is a very important element. By means of these tests it is possible to easily define a normal or abnormal shape of the human body of secondary school students.

To obtain the results regarding somatic indices (Appendix 8) we used a battery of tests regarding waist/height, weight, arm span, bust height, abdominal circumference, sole length and BMI (body mass index).

Knowing the anthropometric parameters presented previously, we can say that these indicators develop unevenly due to the different growth and development in boys and girls, depending on the diet of each, the area where they live and the amount of effort put in.

Table 3.5. Intragroup and intergroup analysis of statistical indicators for somatic measurements of students from the experimental and control classes, girls, at the initial and final testing (n=20)

No. crt.	Somatic measurements	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Height	CE	163,2±2,11	166,5±2,07	11	<0,001
		CM	156,3±2,54	158,2±2,53	6,86	<0,001
		t	2,09	2,54	-	-
		P	>0,05	<0,05	-	-
2.	Body weight	CE	51,72±2,75	54,8±2,42	4,33	<0,001
		CM	54,2±4,69	55,5±4,21	1,94	<0,05
		t	0,45	0,14	-	-
		P	>0,05	>0,05	-	-
3.	Bust height	CE	81,3±1,65	81,7±1,63	0,42	>0,05
		CM	79,7±0,91	80±0,86	1,40	>0,05
		t	0,84	0,32	-	-
		P	>0,05	>0,05	-	-
4.	Abdominal circumference	CE	68,2±2,19	69,9±2,07	7,96	<0,001
		CM	68,6±3,63	69±3,51	1,3	>0,05
		t	0,09	0,22	-	-
		P	>0,05	>0,05	-	-
5.	Arm span	CE	160,6±3,09	161,9±3,21	8,51	<0,001
		CM	157,7±3,01	158,2±2,92	3	<0,01
		t	0,67	0,85	-	-
		P	>0,05	>0,05	-	-
6.	Sole length	CE	23,8±0,26	24,05±0,23	3	<0,01
		CM	22,2±0,2	22,8±0,15	4,12	<0,01
		t	4,87	4,53	-	-
		P	<0,001	<0,001	-	-
7.	BMI	CE	19,49±1,18	19,83±1,02	1,23	>0,05
		CM	22,42±2,32	22,31±2,03	0,30	>0,05
		t	1,12	1,09	-	-
		P	>0,05	>0,05	-	-

Note: CE – Experimental class, n = 10; CM – Control class, n = 10.
P – 0,05; 0,01; 0,001;
f = 9; t = 1,833 2,821 4,296
f = 18; t = 2,100 2,878 3,921

Following the comparative analysis and interpretation of the results of the anthropometric development indicators of the subjects subjected to the research, a higher level results in the final measurements, thus confirming the positive influence of physical exercises practiced during physical education and sports classes, but also in free time, on student development.

Table 3.6. Intragroup and intergroup analysis of statistical indicators for the somatic measurements of students from the experimental and control classes, boys, at the initial and final testing (n=20)

No. crt.	Somatic measurements	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Height	CE	162,9±1,93	165,27±2	6,5	<0,001
		CM	159,11±4	161,44±3,69	4,94	<0,01
		t	0,90	1,45	-	-
		P	>0,05	>0,05	-	-
2.	Body weight	CE	51,57±2,86	54,18±2,76	2,92	<0,01
		CM	43±3,49	47,22±2,99	5,30	<0,001
		t	1,92	2,55	-	-
		P	>0,05	<0,05	-	-
3.	Bust height	CE	82,09±1,27	82,81±1,27	3,06	<0,01
		CM	79,22±1,74	79,33±1,7	1	>0,05
		t	1,36	1,71	-	-
		P	>0,05	>0,05	-	-
4.	Abdominal circumference	CE	74,72±2,51	75,09±2,32	1,30	>0,05
		CM	65,33±1,92	66,33±1,71	2,44	<0,05
		t	2,87	3,15	-	-
		P	<0,05	<0,05	-	-
5.	Arm span	CE	162,45±2,64	162,95±2,67	3,31	<0,01
		CM	159,11±3,55	159,33±3,52	1,51	>0,05
		t	0,77	0,88	-	-
		P	>0,05	>0,05	-	-
6.	Sole length	CE	25,36±0,27	25,45±0,25	1,49	>0,05
		CM	22,77±0,64	23,38±0,52	3,35	<0,01
		t	3,98	4,19	-	-
		P	<0,05	<0,05	-	-
7.	BMI	CE	19,35±1,02	19,82±0,96	1,59	>0,05
		CM	16,75±0,72	18,01±0,42	4,01	<0,01
		t	2	2,47	-	-
		P	>0,05	<0,05	-	-

Note: CE – Experimental class, n = 11; CM – Control class, n = 9.

P – 0,05; 0,01; 0,001;

f= 10; t = 1,812 2,763 4,143

f= 8; t = 1,859 2,896 4,500

f = 18; t = 2,100 2,878 3,921

In order to determine the level of technical preparation of students from the 7th grade, we used the experts' method in the research for motor skills and skills in handball, whereby experienced teachers applied grades to 2 tests, in the month of September, the initial test, and at the end of November the final testing, both in the experimental group and in the control group (Appendix 9). Individual sheets were used to assess the technical elements (Appendix 10). Three professors with the first scientific degree who teach secondary school classes and have over 20 years of teaching experience were part of the teaching staff of the experts.

Table 3.7. Intragroup and intergroup analysis of statistical indicators for experts' grades from experimental and control classes, girls, at initial and final testing (n=20)

No. crt.	Somatic measurements	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Structure nr. 1	CE	6,69±0,07	9,40±0,08	24,66	<0,001
		CM	6,74±0,05	7,67±0,15	12,96	<0,001
		t	0,57	18,35	-	-
		P	>0,05	<0,001	-	-
2.	Structure nr. 2	CE	6,65±0,07	9,35±0,06	28,63	<0,001
		CM	6,74±0,05	8,72±0,06	24,65	<0,001
		t	0,98	7,30	-	-
		P	>0,05	<0,001	-	-
3.	Structure nr. 3	CE	6,74±0,07	9,20±0,07	26,18	<0,001
		CM	6,74±0,05	8,48±0,08	18,52	<0,001
		t	0	6,88	-	-
		P	>0,05	<0,001	-	-
4.	Bilateral game	CE	6,59±0,06	9,09±0,04	33,44	<0,001
		CM	6,34±0,08	8,24±0,05	20,24	<0,001
		t	2,49	12,98	-	-
		P	<0,05	<0,001	-	-

Note: CE – Experimental class, n= 10; CM – Control class, n= 10.

P – 0,05; 0,01; 0,001

f= 9; t = 1,734 2,552 3,610

f= 18; t = 2,100 2,878 3,921

Following the grades applied by the teachers involved in the research, we can easily see the progress from the experimental class that is superior to the control class. Although the application of grades by specialists can be subjective, this assessment exists in the National Assessment System.

The results of the students in the experimental class show a progressive increase in grades from 6 to a grade of 9 or 10, while in the control class it reaches the maximum grade of 8. According to the national evaluation system, the maximum grade can be 10, so the experimental class achieves this performance. The significant differences of the subjects in the two classes lead to the strengthening of the proposed objective.

Considering the level of preparation of the students in the secondary school, grade VII, this method allowed us to evaluate and appreciate the execution of the technical procedures, to detect and correct mistakes taking into account the fact that we are in a period of learning/reinforcement. Although the proposed evaluation tests are structures, formed by a connection of technical procedures, during the lessons we worked on learning units including each procedure separately.

In conclusion, the success of mastering the technical elements through the experts' method is due to the influence of the specific means of the handball game applied in physical education and sports lessons. Positive changes were established in the performance of students in the experimental class, compared to those in the control class.

Table 3.8. Intragroup and intergroup analysis of statistical indicators for experts' grades from experimental and control classes, boys, at initial and final testing (n=20)

No. crt.	Somatic measurements	Groups and ind. statistically	Statistical indicators			
			T_I X ±m	T_F X ±m	t	P
1.	Structure nr. 1	CE	6,73±0,05	9,50±0,07	33,77	<0,001
		CM	6,65±0,08	7,67±0,12	7,22	<0,001
		t	0,84	14,30	-	-
		P	>0,05	<0,001	-	-
2.	Structure nr. 2	CE	6,66±0,08	9,30±0,09	22,29	<0,001
		CM	6,67±0,08	7,61±0,08	8,08	<0,001
		t	0,06	13,43	-	-
		P	>0,05	<0,001	-	-
3.	Structure nr. 3	CE	6,64±0,06	9,28±0,08	26,72	<0,001
		CM	6,71±0,06	7,54±0,07	9,42	<0,001
		t	0,85	16,16	-	-
		P	>0,05	<0,001	-	-
4.	Bilateral game	CE	6,80±0,06	9,13±0,04	34,32	<0,001
		CM	6,74±0,06	7,58±0,09	7,91	<0,001
		t	0,73	16,83	-	-
		P	>0,05	<0,001	-	-

Note: CE – Experimental class, n= 11; CM – Control class, n= 9.

	P – 0,05;	0,01;	0,001
f= 10;	t = 1,724	2,527	3,551
f= 8;	t = 1,745	2,583	3,686
f= 18;	t = 2,100	2,878	3,921

Following the implementation of the pedagogical model that contains means specific to the outdoor handball game, we can affirm the fact that these exercises or exercise structures are effective in order to improve the educational process.

Based on the planning of the activities and the phasing of the contents, we developed a didactic project model (Appendix 11) that respects the links of the lesson with the modification of the working time in the 6th link where the means from the handball game are involved. Taking into account the effort parameters during the lesson, with the help of the didactic project through its links, we recorded the values of the dynamics of effort by the number of pulses and breaths after the preparatory part (links 1,2,3), after the thematic links (4,5) and at the end of the hour (6,7).

In the experimental class at the first lesson carried out as part of the research according to the timing protocol (Appendix 12) we obtained an average of 119 pulses/minute and 20 breaths/minute after the preparatory part, 160 pulses/minute and 22 breaths/minute after the thematic links and 93 pulses/minute and 18 breaths/minute at the end of the hour. Analyzing the dynamics of effort in lesson number 22, we notice certain changes due to the implemented exercises. So, I recorded 144 pulses/minute and 24 breaths/minute after the preparatory part, 183 pulses/minute and 27 breaths/minute after the thematic links and 107 pulses/minute and 20 breaths/minute at the end of the class. Following the accumulated data, we note the following aspects: after the preparatory part, the obtained values are close, after the thematic links, we have a greater increase in the dynamics of

the effort compared to the testing in the first hour, and when recording at the end of the hour, a close decrease in the pulse is observed and of breathing. Due to the effort recorded during the lesson after the thematic sections where exercises specific to the handball game were introduced, a maximum effort of over 180 pulses/minute results, concluding that the students worked actively and with interest on the exercises during the lesson.

The physical education lesson viewed from another perspective, from the point of view of density, the student's working period is the most important. If the work of the teacher through the indications and demonstrations that he performs during the lesson is also important, the most effective is the period of time in which the student works. The motor density in the classes participating in the experiment, based on the results obtained, we have a value of 68% effective work in the experiment class, and in the control class we obtain a value of 48% effective work per hour. These percentages were recorded by the ratio between the student's execution time and the effective duration of the lesson multiplied by 100 according to the density protocol (Appendix 13).

Pedagogically analyzing the physical education lesson, I found that the homework was done successfully, the exercises were chosen efficiently, the dosage was very good, the students actively participated in the activities within the lessons, were involved in the execution of the proposed means, they were enthusiastic about discovering new exercises and responded positively to the teacher's demands.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. Following the bibliographic analysis of relevant literature data, we can state that the particularities related to the organization and conduct of physical education and sports lessons in secondary school can be improved in order to increase efficiency. By applying the means of handball, the efficiency of the instructional-educational process can be increased in the discipline of physical education. The information gathered from the specialized literature highlights different opinions of the authors that specify the fact that we must carefully choose the contents we use in the instructive-educational process in order to have a good efficiency in teaching physical education.

2. Several specialists in the field state that handball is a game accessible to all students because the technical procedures are done by hand, the rules are simple, there is immediate satisfaction after scoring a goal and the playing conditions do not require intensive preparation. All the more, handball contributes to the development of motor skills, as well as to the acquisition of motor skills and abilities that are determined by the knowledge of the particularities of growth and development of secondary school students.

3. In order to organize a research according to current standards, the opinions of 652 secondary school students from different schools were analyzed. It was found that 87% of students come to school with pleasure, 90% participate with pleasure in physical education class and are actively involved in the activities of this discipline. In these lessons, they conscientiously work on the indicated exercises and structures, but also practice sports games such as football, handball, volleyball, basketball and others. Analyzing the answers of the questioned teachers, we can state that they use means from the sports game handball during physical education and outdoor sports

lessons. Moreover, 93% of those surveyed recommend the application of these means in the contents of the instructional-educational process in order to increase the efficiency of the lesson.

4. Considering the results obtained in the confirmatory experiment, we can conclude that the students involved are at an average level from an anthropometric point of view, the average for girls being 159.74 cm in height and 46.14 kg in body weight, and for boys we have the height of 161.15cm and 45.65kg body weight. According to the Romanian national evaluation system for motor tests, both girls and boys obtain results that lead us to a low to medium level, so the grade that represents this performance is 7, from a grading scale from 5 to 10.

5. The development and implementation of the pedagogical model with means from the game of handball had a positive impact on the lessons of physical education and outdoor sports leading to the achievement of the objectives. So, the contents of the experimental planning ensured the increase in the effectiveness of the outdoor physical education lesson, in improving the state of health, in practicing a sport with love and last but not least, in school success.

6. The statistical analysis of the results obtained in the pedagogical experiment of implementing the means specific to the game of handball, in the final tests in the experimental and control classes, were superior to the initial tests. The values of the "t" test show significant values for the 8 samples specific to the handball game, at $P<0.05$, $P<0.01$ and $P<0.001$, respectively. Superior results were obtained by the experimental class due to the model of implementing handball tools in physical education and sports lessons, in the final tests as follows: dribbling in a straight line 30 m - girls $t=3.22$, $P<0.01$ and boys $t=2.81$, $P<0.05$; dribbling between the goalposts 30 m – girls $t=3.54$, $P<0.01$ and boys $t=4.16$, $P<0.01$; throwing the handball with a swing – girls $t=9.55$, $P<0.001$ and boys $t=7.22$, $P<0.001$; displacement in the triangle – girls $t=11.94$, $P<0.001$ and boys $t=9.88$, $P<0.001$; girls and boys – structures no. 1,2,3 and bilateral play $P<0.001$.

7. After comparing the results obtained in the motor tests of the classes engaged in the research, we can conclude that there are insignificant differences in the initial testing, and in the final testing there are significant differences, both in girls and in boys. During the outdoor physical education lessons by applying different contents to the experiment class, it allowed us to approach a progress of the results, therefore the girls in the experiment class achieve a "t" value of 5.50 in speed running 30m and 7.97 in 5x10m shuttle, where $P<0.001$, 3.36 in standing long jump, where $P<0.01$ and 2.63 in push-ups, where $P<0.05$. The values of the boys at the final testing are different compared to those obtained by the girls, there is also progress in them, therefore in the 30m sprint, the 5x10m shuttle and the "t" push-ups show significant values $P<0.001$, and in the long jump of per site $P<0.05$.

8. The growth and physical development of secondary school students cannot be modified by introducing some means from the handball sport game. If by applying these exercises and structures children can acquire an ideal, athletic shape of the human body, this does not mean that it can influence the increase or decrease of somatic indices. Children in this period of life, the pubertal period develops naturally, therefore, statistically analyzing, the girls from the experimental class at the initial and final measurements obtain significant values for the somatic parameters height, body weight, abdominal circumference, arm span $P<0.001$ and sole length $P<0.01$, while girls in the

control class achieve P<0.001 for height, P<0.01 for arm span and foot length, P<0.05 for body weight and P>0.05 for bust height and circumference abdominal. Comparing the values obtained by the boys from the experimental class at the initial and final measurements, they obtain significant values for the somatic parameter height P<0.001, body weight, bust height and arm span P<0.01, while the boys from the control class obtain P<0.001 in body weight, P<0.01 in height and sole length and P<0.05 in abdominal circumference.

9. Using the expert method allowed us to observe the correct execution of each participant or detect the mistakes they make. Considering the fact that the students involved in the research are in the learning-consolidation period, correcting mistakes is beneficial.

10. Considering the results obtained by the experiment class in all the tests within the research, we can affirm that they are more effective than the results obtained by the control class. Both girls and boys progressed from one test to another proving that the handball tools applied in the lessons were effective. We can state that the rigorous planning, the use of the right means and motor structures led to the achievement of the handball homework, ensuring an improvement in outdoor physical education lessons, confirming the hypothesis formulated at the beginning of the research. By applying handball tools to secondary school students, we found an increase in motor and functional density leading to an increase in the efficiency of the outdoor sports and physical education lesson.

Following the analysis of bibliographic materials and the pedagogical experiment carried out, we came to the conclusion that the current scientific problem solved involves the improvement of annual school calendar planning by implementing handball tools at the secondary school level in order to increase the efficiency of the outdoor physical education lesson that can be introduced with success with the purpose of developing motor skills and increasing technical training.

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1. In order to increase the efficiency of the physical education lesson, it is recommended that the teacher deepens the specialized materials, in order to select the most suitable means.

2. We recommend the reliable use of the school calendar plans that contain exercises and technical structures from the game of handball with the purpose of increasing the efficiency of the lesson of physical education and outdoor sports.

3. The correct organization of the lesson with the students from the gymnasium classes held outdoors, the use of appropriate equipment depending on the weather conditions, the adaptation of the contents according to the level of preparation.

4. The positive results obtained by the subjects from the experimental class will be an impetus for the involvement of the other students in the school to actively participate in physical education classes.

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List of author's publications on the topic of the thesis

1. **CIUBOTARU, Mihai.** *Educație și mișcare prin jocul de handbal în lecția de educație fizică.* Simpozion interjudetean „MIȘCARE, SĂNĂTATE, VIAȚĂ”, ediția a VII-a, organizat la Colegiul Național “Ștefan cel Mare”, Suceava, 12 decembrie 2019.
2. **CIUBOTARU, Mihai.** *Studiu constatativ privind profilul antropometric al elevilor din ciclul gimnazial.* Chișinău: 10-12 septembrie 2020 Congresul Ştiinţific Internaţional “Sport. Olimpism. Sănătate”, ediţia a V-a.
3. **CIUBOTARU, Mihai.** *Studiu privind identificarea posibilităților de creștere a eficienței lecției de educație fizică în aer liber în ciclul gimnazial.* Simpozion interjudețean „MIȘCARE, SĂNĂTATE, VIAȚĂ”, ediția a VI-a, organizat la Colegiul Național “Ștefan cel Mare”, Suceava, 29 noiembrie 2018.
4. **CIUBOTARU, Mihai.** *Studiu privind profilulul antropometric al elevului din ciclul gimnazial.* Suceava: GlobeEdit, 2019. p. 93. ISBN 978-613-9-41618-9.
5. **CIUBOTARU, Mihai,** LEUCIUC, F., PRICOP, Ghe. *Analysis of Student Opinions on the Motivation of Physical Education Lessons.* „Vasile Alecsandri”, University of Bacău, Faculty of Movement, Sports and Health Sciences, GYMNASIUM, [S.l.], v. XX, n. 2, p. 124-138, dec. 2019. ISSN 2344-5645.
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7. **CIUBOTARU, Mihai,** LEUCIUC, Florin. *Study on efficiency of physical education lesson in open-air in secondary school.* Analele Universităţii „Eftimie Murgu” din Reşiţa Fascicola de Ştiinţe Social-Umaniste Anul VI, 2018. p. 95-103.
8. **CIUBOTARU, Mihai,** LEUCIUC, Florin. *The analysis of teaching physical education in secondary school.* The 4th Edition of the International Conference, SEC – IASR 2019 “Sports, Education, Culture - Interdisciplinary Approaches in Scientific Research”, The Annals of “Dunarea de Jos” University of Galati, Fascicle XV, ISSUE 2, 2019. p. 18.
9. **CIUBOTARU, Mihai.** *Aspects relating to the teaching of the handbal games in secondary school.* Suceava: „Stefan cel Mare” University, 2019. p. 66-80. ISSN 2601 - 341X, ISSN 1844-9131.
10. **CIUBOTARU, Mihai.** *Motor skill preparation of secondary school students in outdoor physical education lessons by applying the methods of handball.* Chișinău, 2021. Nr. 37/1 – 2021, p.146-155.

ANNOTATION

Ciubotaru Mihai: ***The efficiency of the outdoor physical education lesson in the secondary school by applying the means of handball, doctoral thesis in education sciences, Chişinău, 2022.***

Structure of the thesis: annotation, introduction, 3 chapters, conclusions and recommendations, bibliography 255 sources, 193 pages, basic text 123 pages, 11 tables, 40 figures, 15 annexes. The obtained experimental results are published in 10 scientific papers.

Key words: students, secondary school, lesson, physical education, specific means, handball, throwing, catching, passing, motor skills, technical training.

The purpose of the research consists in the elaboration and implementation of the model of application of the means specific to the game of handball at the level of the secondary school cycle, in the 7th grade, which leads to the increase of the efficiency of the physical education lesson and the achievement of the objectives of school physical education.

Research objectives: 1. Analysis of specialized literature regarding the organization of the physical education process in the secondary school cycle. 2. Analysis of teachers' and students' opinion regarding the introduction of handball equipment in outdoor physical education lessons. 3. Elaboration of the model for the implementation of the means from the game of handball in the outdoor physical education lessons in the 7th grade. 4. Experimental argumentation of the effectiveness of the outdoor physical education lesson in the gymnasium by applying handball tools.

Scientific novelty and originality: it consists in the development and implementation of the model of application of the means specific to the game of handball, which used in outdoor physical education lessons leads to an increase in the efficiency of the lesson through the formation of motor skills and the development of the physical qualities of secondary school students.

The **current scientific problem solved** consists in improving school planning by implementing handball tools at the secondary school level in order to increase the efficiency of outdoor physical education lessons.

The **theoretical significance** of the work indicates that by introducing the means from the game of handball, a high efficiency of the lesson was obtained, leading to the achievement of the objectives of physical education.

The **applicative value** of the work offers the possibility for physical education teachers to use handball tools in outdoor physical education lessons to make them more efficient. The obtained information can complete the theoretical and practical databases of the didactic process in physical education.

Implementation of scientific results. The research results were implemented in pre-university institutions in Romania and published in a series of national and international scientific conferences and symposia.

ADNOTARE

Ciubotaru Mihai: ***Eficienţa lecţiei de educaţie fizică în aer liber în ciclul gimnazial prin aplicarea mijloacelor din handbal***, teză de doctor în ştiinţe pedagogice, Chişinău, 2022.

Structura tezei: adnotare, introducere, 3 capitole, concluzii şi recomandări, bibliografie 255 surse, 194 pagini, text de bază 123 pagini, 11 tabele, 40 figuri, 15 anexe. Rezultatele experimentale obţinute sunt publicate în 10 lucrări ştiinţifice.

Cuvinte-cheie: elevi, gimnaziu, lecţie, educaţie fizică, mijloace specifice, handbal, aruncare, prindere, pasare, capacităţi motrice, pregătire tehnică.

Scopul cercetării constă în elaborarea și implementarea modelului de aplicare a mijloacelor specifice jocului de handbal la nivelul ciclului gimnazial, la clasa a VII-a, care să conducă la creșterea eficienței lecției de educație fizică și realizarea obiectivelor educaţiei fizice școlare.

Obiectivele cercetării: 1. Analiza literaturii de specialitate cu privire la organizarea procesului de educație fizică în ciclul gimnazial. 2. Analiza opiniei profesorilor și a elevilor cu privire la introducerea mijloacelor din handbal în cadrul lecțiilor de educație fizică desfășurate în aer liber. 3. Elaborarea modelului de implementare a mijloacelor din jocul de handbal în cadrul lecțiilor de educație fizică în aer liber la clasa a VII-a. 4. Argumentarea experimentală a eficienței lecţiei de educaţie fizică în aer liber în ciclul gimnazial prin aplicarea mijloacelor din handbal.

Noutatea și originalitatea științifică: constă în elaborarea și implementarea modelului de aplicare a mijloacelor specifice jocului de handbal, care utilizate în lecțiile de educație fizică în aer liber duce la creșterea eficiența lecției prin formarea deprinderilor motrice și dezvoltarea calităților fizice a elevilor din ciclul gimnazial.

Problema științifică actuală soluționată constă în îmbunătățirea planificărilor școlare prin implementarea mijloacelor din handbal la nivelul ciclului gimnazial în vederea creșterii eficienței lecției de educație fizică în aer liber.

Semnificația teoretică a lucrării indică faptul că prin introducerea mijloacelor din jocul de handbal s-a obținut o eficiență ridicată a lecției conducând la realizarea obiectivelor educației fizice.

Valoarea aplicativă a lucrării oferă posibilitatea profesorilor de educație fizică să utilizeze mijloacele din handbal la lecțiile de educație fizică în aer liber pentru eficientizarea acestora. Informațiile obținute pot completa bazele de date teoretice și practice a procesului didactic din educație fizică.

Implementarea rezultatelor ştiinţifice. Rezultatele cercetărilor au fost implementate în instituțiile preuniversitare din România și publicate într-o serie de conferințe și simpozioane științifice naționale și internaționale.

АННОТАЦИЯ

Чуботару Михай «Эффективность урока физического воспитания на свежем воздухе в среднем цикле образования с применением средств гандбола»: диссертация на соискание степени доктора педагогических наук. Кишинэу, 2022

Структура диссертации: аннотация, введение, 3 главы, общие выводы и рекомендации, библиография – 255 источников, 194 страницы, включая 123 страницы основного текста, 11 таблиц, 40 фигур, 15 приложений. Полученные экспериментальные результаты опубликованы в 10-ти статьях.

Ключевые слова: ученики, средний цикл образования, урок, физическое воспитание, специальные средства, гандбол, бросок, ловля, передача, бросок в ворота, двигательные качества, техническая подготовка.

Цель исследования состоит в разработке модели применения специальных средств игры в гандбол на уровне среднего цикла образования, в VII-ом классе, направленной на решение задач физического воспитания для повышения эффективности урока физического воспитания и спорта.

Задачи исследования: 1. Изучение специальной литературы с целью выявления методологических аспектов использования специальных средств игры в гандбол на уроках физического воспитания. 2. Проведение социального опроса среди учеников и преподавателей по внедрению некоторых средств гандбола на уроках физического воспитания на свежем воздухе. 3. Разработка модели внедрения специальных средств гандбола на уроках физического воспитания, проведенных на свежем воздухе, с учениками седьмого класса. 4. Экспериментальное обоснование уровня усвоения технических элементов гандбола на уроках физического воспитания на свежем воздухе в среднем цикле образования.

Научная новизна и оригинальность исследования состоит в разработке модели применения специальных средств гандбола, которая, примененная на уроках физического воспитания и спорта на свежем воздухе в среднем циклу образования, повышает эффективность урока и развивает двигательные качества и навыки.

Значимая научная проблема, решенная в исследовании, состоит в улучшение школьного проектирования путем внедрения средств гандбола в среднем цикле образования с целью повышения эффективности урока физического воспитания на свежем воздухе.

Теоретическая значимость работы заключается в том, что применение средств игры в гандбол обеспечило высокую эффективность урока и привело к решению задач физического воспитания.

Практическая значимость работы определена возможностью использования учителями физического воспитания средств гандбола, обоснованных в диссертации, для повышения эффективности уроков физического воспитания на свежем воздухе. Полученные данные могут дополнить теоретическую и практическую базу учебного процесса в области физического воспитания.

Внедрение научных результатов происходило в рамках учебно-воспитательного процесса с использованием средств гандбола с учениками седьмого класса Технологического лицея «Йоргу Вырнав Литяну», г. Литень, уезда Сучавы.

CIUBOTARU Mihai

THE EFFICIENCY OF THE OUTDOOR PHYSICAL EDUCATION LESSON IN THE SECONDARY SCHOOL BY APPLYING THE MEANS OF HANDBALL

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