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INCREASING THE GENERAL MOTOR SKILLS OF HIGH SCHOOL STUDENTS BY APPLYING THE MEANS OF RUGBY

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Abstract of the doctoral thesis in educational sciences

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The doctoral thesis and the abstract can be consulted at the National Library of the Republic of Moldova, the Central Library of the State University of Moldova (https://usm.md/) and on the ANACEC website (https://www.anacec.md/).

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CONTAINED

ABBREVIATIONS LIST

Art. – Article
ATP – Adenosine triphosphate (cells that store energy in the human body)
ATP+CP – phosphogen system (system that provides the energy needed for physical exertion)
GE – experiment group
GM – control group
Cv% – the coefficient of variability; σ - standard deviation; n – number; t – student t criterion
LT – Technological High School
ME – Ministry of Education
MEC – Ministry of Education and Research
MEN – Ministry of National Education
CNS – central nervous system
SNE – National Evaluation System (for the physical education discipline)

CONCEPTUAL LANDMARKS OF THE RESEARCH

Topicality and importance of the topic.

The importance of physical education in maintaining and promoting optimal health among adolescents is indisputable, especially in a social context marked by hypodynamism, passivity and an alarming increase in absenteeism. Currently, the high school student benefits from an insufficient volume of organized motor activities, specific to physical education classes, which determines the teacher to adopt a permanently innovative attitude, focused on identifying and implementing modern methods, procedures and means of educational intervention [99, p.64].

Of all the forms of organization of motor activities at high school level, the physical education lesson is maintained as a fundamental form of training and development. In Triboi V.'s view [169, p. 65], it is defined as "a component of general education, expressed through a type of motor activity, carried out in an organized or independent manner, whose content, specifically conceived, aims to optimize the biomotor potential of the individual, as well as its cognitive, affective and socio-relational dimensions, thus contributing to the improvement of the quality of life".

In the context of the current demands of school physical education and concerns for an active lifestyle, increasing the general motor skills of high school students is a priority. Studies and curricular documents highlight the need to streamline the physical education class in high school education, in order to form basic motor skills and positive attitudes towards movement.

Description of the situation in the field of research and identification of the research problem.

Streamlining the physical education lesson in high school education becomes an imperative in the context of continuous transformations of the national education system. This optimization has an essential role in consolidating a quality education, which meets both contemporary requirements and the real needs of students. The final objective goes beyond the scope of developing the general competences of the discipline, orienting itself towards **the formation of a balanced motor structure**, but also towards the cultivation of an active and constant attitude towards movement, throughout life.

Numerous specialists in the field of physical education, in their reference works C. Albu [1], I. Carp [7], Ghe Cîrstea [8], C. Ciorba [10], D. Cristea [16], A. Dragnea [21], P. Ghervan [24], L.P. Matveev [31], Gh. Mitra [33], G. Rață [40], V. Triboi [42], systematically analyze the methods, means and forms of organizing physical education lessons in general education. These contributions emphasize the importance of applying the specific didactic and methodological

principles, which guide the teacher's activity in the complex teaching-learning-evaluation process, in order to achieve the educational objectives proposed within the discipline.

In recent years, **Romanian researchers such** as A. Atanasiu [2], M. Ciubotaru [12], A. Păunescu and M. Anisie [36] and L. Potop [39] have directly dealt with the issue of teaching physical education in the school environment. Through the results of the research undertaken, they have significantly contributed to the optimization of the educational process of the discipline, promoting the diversification of teaching methods and means, by integrating components from multiple sports branches.

The studies carried out in the field of **physical education at high school level**, elaborated by authors such as G. Cozmei [15], D. Ivașcu [26], I. Laurențiu [28], D. Oprescu [34], S. Rău and P. Moisescu [41], highlight the need for a new approach to the discipline, adapted to the specificity of adolescence. This research underlines the fact that high school students increasingly feel the need for additional motivation to be actively involved in motor activities, both within the school curriculum and in extracurricular activities, in order to harmoniously develop their biomotor potential.

High school students are in adolescence, considered by many specialists [1, 19, 20, 27, 37] as a sensitive stage in the development of motor skills. It is the moment when basic motor skills reach an optimal level of manifestation, and the potential for the development of psychomotor qualities is maximum. This stage should be an essential pedagogical benchmark for teachers, who are called upon to design physical education lessons in a manner adapted to the age and developmental level of students.

Within the discipline of physical education for high school, sports games occupy a central place in the curriculum. According to Ivașco D. [25, p. 66], they "constitute the main content of school physical education, which is based on the support of students, their importance being valid for the entire process of training and sports education of students in the pre-university cycle." In the same vein, Popovici Ilinca [38, p. 62] states that the game represents "a phenomenon of culture, a form of human activity", and its application as an educational means contributes to the preparation of the student for the later stages of daily life.

Within the physical education curriculum for high school classes, the game of rugby is included in the category of alternative sports disciplines, which can be implemented selectively, for determined periods, depending on the environmental conditions, the available technical-material resources and the level of training of the teachers. Through its formative valences, the game of rugby becomes an effective didactic means for enriching the motor repertoire of high school students. Its practice, by acquiring specific means, technical elements, individual, group

and team tactical procedures, favors the development of general motor skills, creating the premises for the efficient application of motor actions in daily life [43, p. 183].

Research problem. The current realities in high school education highlight increasingly frequent difficulties in maintaining students' interest in physical education lessons and in ensuring real progress in motor development. Passive participation, decreased motivational levels and modest results in motor indicators reveal the limits of the traditional methods applied in these lessons. Although the curriculum offers openness to various contents, the implementation of innovative means, adapted to the particularities of adolescents, remains limited. In this context, it becomes necessary to reconfigure the teaching approach, by identifying and validating means that increase both the attractiveness of the lesson and the efficiency of the teaching-learning process. Among these solutions, the application of the means specific to the game of rugby – a sport with a complex motor content and high formative valences – stands out as a promising alternative. The research problem of the paper lies in the evaluation of the impact of the systematic integration of rugby means in physical education lessons on the development of general motor skills of high school students and on the efficiency of the educational process. Thus, the aim is to identify a didactic solution that simultaneously responds to the modern curricular requirements and the psycho-motor training needs of adolescent students.

The object of the research is the process of applying the means specific to the game of rugby in the physical education lesson for high school students.

The purpose of the research: consists in the development of the general motor skills of high school students by applying the means of the game of rugby in physical education lessons, in order to streamline the educational process and achieve the educational purposes of the discipline.

Research objectives:

1. Analysis of the literature on the organization of the educational process in the discipline of physical education of high school students.
2. Determination of the level of motor training of high school students in Romania.
3. Design and implementation of the means of the game of rugby in physical education lessons with students in the tenth grade.
4. Experimental argumentation of the efficiency of the physical education lesson by applying the means of rugby to high school students.

Research hypothesis

It was assumed that the integration of the means specific to the game of rugby in the physical education lessons for high school students, given the complex, rich and varied character of the technical-tactical actions of this sport, will significantly contribute to increasing the interest

and positive attitude of students towards motor activity and sports practice in general. This active involvement in the educational process will facilitate the achievement of the goals provided in the disciplinary curriculum, by forming new skills and motor skills, as well as by developing a higher level of general motor skills.

Research methodology

In order to achieve the set objectives, a set of complex methods was used, systematically organized and adapted to the theme of the present research. Thus, the methods used have been classified as follows:

- Methods specific to the theoretical dimension: analysis of the specialized literature from a pedagogical and methodological point of view on the research topic, its interpretation and capitalization;
- Methods specific to the experimental dimension: use of data collection methods such as the questionnaire method, the death test method;
- Methods specific to the statistical dimension: application of statistical-mathematical methods with the help of charts and tables.

The experimental sample consisted of:

- students from two tenth grades: the experimental group - 29 students from the "Marin Preda" Theoretical High School in Bucharest and the control group 28 students from the "Aurel Vlaicu" National College in Bucharest.

The scientific novelty and originality of the research consists of:

- innovative didactic design of the physical education lesson, by integrating the means specific to the game of rugby, as a methodical strategy aimed at developing the general motor skills of high school students;
- the development and application of an experimental model of motor instruction, based on technical-tactical contents of the game of rugby, adapted to the age particularities and the level of preparation of the students in the high school cycle;
- capitalizing on the contents of the game of rugby within the physical education lessons, in order to diversify the educational approach and increase the efficiency of the instructive-formative process;
- determining the motivational and functional impact of the systematic use of rugby means on the development of general motor skills and the active involvement of students in deadly activities.

The scientific problem solved was the streamlining of the teaching-learning-evaluation process within the physical education discipline at high school level, by optimizing the didactic design from the perspective of integrating the means specific to the game of rugby.

The theoretical significance of the work consists in the scientific foundation of an innovative didactic approach, through which the physical education lesson is streamlined and diversified by applying the means specific to the game of rugby, adapted to the particularities of high school students. The study contributes to the extension of the theoretical framework on the formation of general motor skills, offering new perspectives on the use of team sports as educational resources in the process of training the competences specific to the discipline.

The applicative value of the work. The results obtained during the research can serve as a methodological and practical benchmark for physical education teachers, providing them with scientific support in: didactic design of lessons, adapted to the curricular requirements and particularities of high school students; the efficient organization of the educational process, through the conscious and functional integration of the means of the game of rugby; capitalizing on the formative potential of rugby in order to develop general motor skills, through specific, coherent and applicable activities in various educational contexts.

Implementation of research results. The results obtained from the research were capitalized in practice through the experimental implementation of the means specific to the game of rugby within the physical education lessons held in high schools in Romania. At the same time, the conclusions and findings of the study were disseminated at national and international scientific conferences, as well as published in specialized journals, thus contributing to the enrichment of the field of physical education and sport with new, scientifically validated data and methodological directions.

Publications on the topic of the thesis: During the research, about 6 scientific articles were published in specialized journals, indexed in international databases, as well as in the materials of scientific conferences.

Volume and structure of the thesis: the thesis comprises 150 basic pages of which introduction, 3 chapters, general conclusions, recommendations, bibliography with 184 cited sources, 6 annexes. The work includes 17 tables, 41 figures.

Keywords: students, high school, physical education lesson, general motor skills, rugby means.

THESIS CONTENT

In the Introduction, the topicality and importance of the approached problem were presented, the situation in the field of research was described, the problem, the object, the purpose and the objectives of the research were formulated. Also, the research hypothesis, the scientific novelty and originality of the obtained results, the theoretical significance, the applicative value, the approval of the results were presented, the research methods were described, the publications on the topic and the keywords were presented.

Chapter 1 entitled "Conceptual guidelines on the formation of general motor skills in high school students" provides a solid theoretical foundation on the development of motor skills during high school, approaching this process from multiple perspectives: pedagogical, physiological, psychological and methodological.

Physical education is an essential dimension of general education, which promotes the harmonious development, health and social integration of students. It is defined as an organized set of motor activities, regulated and pedagogically oriented [25, p. 65], with multiple, biological and psycho-social formative valences [Paraschiv, quoted by Ciubotaru Mihai, 11, p. 61]. According to Carp I., physical education systematically capitalizes on physical exercises and hygienic-natural factors in order to develop moral, functional and motor qualities [6, p. 14], and in Moisescu's view, it actively participates in the socialization process of students [41, p. 104].

In Romania, the system is regulated by the Law on Physical Education and Sport no. 69/2000, which provides that these activities are of national interest and supported by the State. The physical education lesson is the main organizational framework in which motor skills, positive attitudes towards movement and health behaviors are formed [6; 17; 31; 42]. It is characterized by clearly defined objectives, rigorous didactic structure and methods adapted to the specificity of the group [2, p. 22].

The contents of the high school curriculum are organized in areas such as: health, individual protection, personality development, culturality, motor qualities and skills, and sports disciplines [32]. Unlike the lower cycles, in high school the emphasis is on self-control, capacity for effort, adaptability and the formation of an autonomous attitude towards motor activity. The content elements are selected in such a way as to respond to the particularities of the age and individual interests of the students [25, p. 19].

However, the educational process encounters difficulties, generated by unequal levels of motor preparation [32], different previous acquisitions [18], and variable motivation among students [35; 44]. Therefore, it is essential to apply the principles of individualization,

differentiation and diversification of the motor offer.

So, the physical education lesson in high school contributes decisively to the formation of motor skills and a health-friendly attitude. The quality of the educational approach depends on the adaptation of the contents, the methods used and, above all, the professionalism of the teacher [15, p. 21].

Motor skills are defined as the totality of the movements of the human body performed by the contraction of skeletal muscles, having a role in interaction with the environment and functional adaptation. It includes both simple, everyday movements and complex actions, specific to sports activities [22, p. 3].

At the age of high school, motor development is strongly influenced by the particularities of adolescence. Its stages – preadolescence, adolescence proper and prolonged adolescence – are characterized by significant morphofunctional changes and maturation of the neuroendocrine system. These transformations generate an increase in motor perception capacities, stabilization of basic motor skills and the development of coordination [20; 29].

Motor skills are formed and perfected through systematic exercise, reflecting the efficiency and automation of motor acts [18, 23]. Their classification can be made according to several criteria, such as: type of driving (self-driven vs. heterodriven), complexity (elementary vs. complex), use (technical, tactical, applicative) and level of automation [21; 22]. These habits have essential features: relative stability, plasticity, irreversibility and individualization according to the subjects' aptitudes [24; 42].

In high school, motor skills are in the improvement phase, characterized by adaptation to various conditions and integration into complex sequences of movements [31, 40]. In this sense, psychomotricity becomes a relevant concept, being the expression of the integration between motor functions and cognitive processes – laterality, spatio-temporal organization, body schema [36, p. 3].

The fundamental motor qualities (strength, speed, skill, endurance) evolve significantly during this period. Strength is defined as the ability to resist through muscle contraction and is classified into general and specific, static and dynamic, maximum and relative, being influenced by biomechanical, physiological and psychological factors [9; 10].

Strength, as a fundamental motor trait, represents the ability to overcome resistance through muscle contraction. It is classified into: general strength (involves all muscles), specific strength (adapted to a sport), static strength (isometric), dynamic (isotonic), maximum strength (the highest possible in a contraction), relative strength (in relation to body weight), speed mode (for explosive movements), skill mode (for precise movements), resistance mode (for sustained effort).

Speed is the ability to execute movements in the shortest time, manifesting itself in various forms (reaction, execution, displacement) and being conditioned by the type of muscle fibers, nerve conduction speed and joint mobility.

The skill reflects adaptability in various contexts, expressing itself through precision, balance and coordination, being influenced by motor experience and cognitive abilities. It is essential for effective integration into sports activities and is closely correlated with the development of other qualities.

Endurance refers to the body's ability to sustain lasting efforts and is classified into general, local, aerobic and anaerobic. It is dependent on the efficient functioning of the cardiovascular and muscular systems, but also on energy balance and willpower.

From an educational perspective, students' motor skills are shaped in physical education lessons through theoretical and practical contents, centered on various activities that stimulate initiative, autonomy and active involvement. Sports games, in particular, represent an optimal environment for motor development, providing opportunities for functional motor learning and active participation [25, p. 66].

We summarize that the development of motor skills during high school takes place in a favorable biological and psychological context, being a sensitive stage for the formation of psychomotor skills and qualities. A balanced curriculum and well-planned lessons can significantly contribute to the formation of functional, expressive and efficient motor skills, supporting the harmonious development of students and the formation of an active and healthy lifestyle.

The physical education lesson in high school education is carried out in accordance with regulatory documents, such as the Law on Physical Education and Sports and the methodological landmarks, which ensure the coherence of teaching and the achievement of educational goals [175, p. 80].

The national curriculum offers teachers the possibility to develop flexible educational paths adapted to the level of the students, in accordance with fundamental teaching principles [115].

The high school stage is characterized by the refinement of motor behavior and the development of the ability to capitalize on effective actions, which requires integrated methodological approaches.

Play, as an educational means, contributes to the intellectual, emotional and social development of the student, being perceived as a cultural and psycho-pedagogical phenomenon, with an essential formative role.

Colibaba-Evuleț D. argues that sports games involve training methods determined by the

structure of motor actions, integrated into a coherent system aimed at technical, tactical, mental and theoretical training [13, p. 147]. Ivașcu Daniela highlights the role of these games in the development of physical qualities and motor skills, but also in the formation of skills and attitudinal values [26, p. 64].

The game of rugby, included in the category of alternative sports disciplines in the high school curriculum [32, p. 3], involves a variable structure and a complex motor content. Badea Dan describes it as a team game with integral formative valences, which combines the technical dimension with the development of the player's personality [4, p. 20]. The various forms of play – Rugby XV, XIII and VII – require adaptability and complex training, and its specific rules require a high capacity for concentration and cooperation [4, 43].

The literature emphasizes the formative impact of sports games in three directions: motor development, physiological compensation and recreation. Badea Dan proposes a complex formative model that includes tactical, technical, psychological, physical and environmental components [12, p. 21].

Rugby favors the development of coordination skills through various actions (passing, tackling, kicking, etc.), each requiring biomechanical control, balance, orientation and precision [22, p. 14–15].

The motor content specific to rugby determines significant morphofunctional adaptations: increase in muscle mass, development of fast fibers, improvement of vascularization, neuromotor coordination and muscular endurance [3, 14, 30]. It also positively influences cardio-respiratory functions and the central nervous system, optimizing feedback mechanisms and the mobility of nervous processes.

The practice of rugby contributes to the motor maturation and personality development of the adolescent, the high school age being considered a "second golden age" of learning. The training methodology, based on the principles of progressivity and algorithmization [12, p. 30], supports the efficiency of the training process. The application of rugby means favors the development of decision-making skills, responsibility and cooperation, having a significant impact on the somatic, psychomotor and educational levels.

Chapter 2 "Evaluation of motor skills in high school students and the applicative dimension of specific means in rugby in physical education lessons" describes the design of the pedagogical experiment, establishes the stages of the experiment, the description of the constative and formative experiment but also the analysis of the data obtained.

In the first stage of the research, the teachers' perception of the integration of rugby means in physical education lessons was followed, with a focus on stimulating students' motor skills. An

online questionnaire addressed to high school teachers was applied, completed by 209 respondents. The tool included 13 questions from general aspects to specific items regarding rugby as a teaching medium.

Most respondents (64.2%) are between 30–50 years old and have a high level of qualification (43.1% grade I). Almost half (48.8%) teach at high school. The students' interest in physical education is perceived as medium or low, and the level of motor skills – mostly medium (55.5%).

Team sports are considered the most attractive: football (88.5%), basketball (73.2%) and handball (61.2%). Rugby is mentioned by 47.4%, surpassing other sports such as gymnastics, which gives it a relevant motivational potential. 96.2% of teachers believe that rugby can stimulate general motor skills.

However, only 39.3% say they apply rugby means "to a large extent" or "very large", while 27.3% use them "to a very small extent", indicating difficulties in implementation. These means are considered suitable for the basic (40.2%) or preparatory (35.4%) part of the lesson. 20.1% would apply them throughout.

Among the skills developed are: cooperation (91.3%), motor skills (85.6%), technical-tactical skills (74.1%) and effort capacity (70.3%). At the same time, 93.3% believe that rugby can be adapted in high school lessons, with benefits such as: development of motor skills (68.4%), technical-tactical skills (59.3%) and decision-making skills (35.8%).

The main difficulties identified are: lack of materials (48.3%), insufficient professional training (41.6%) and reluctance towards sport perceived as "tough" (37.2%). However, 79.4% support the inclusion of rugby in the curriculum, and 65.3% want optional modules in the lessons. In conclusion, the teachers recognise the educational potential of rugby, but stress the need for specific training, adapted methodologies and appropriate logistical conditions. Its curricular integration can contribute to motor development and the formation of transversal skills relevant to high school students.

In order to substantiate the basic pedagogical experiment, it was necessary to carry out a preliminary experiment with a finding character, which would validate the hypotheses regarding the need for intervention in physical education lessons to optimize the development of general motor skills in high school students. It aimed to diagnose the level of general motor skills of students in Bucharest, by relating their performance to the minimum and maximum scales provided in the National Evaluation System (NSS), which reflects the global expression of motor capacity.

The investigated group was made up of students of the ninth – twelfth grades, coming from eight representative high schools of the Capital. Although the tests were applied unitarily, the interpretation of the results was differentiated, depending on the gender, for an increased accuracy of the analysis. The activity was carried out under standardized conditions, with common assessment tools, and the data obtained were statistically processed and graphically represented, forming the basis of the initial assessment of the students' motor level.

During the tests applied to the students in the ninth grade, the tests provided in the National Evaluation System were used: the long jump from the spot, push-ups, the jump in distant support over the goat, the acrobatic element, the 50 m speed run and the 5x10 m shuttle (Table 1). The results indicate, on average, a placement between the maximum and minimum scales, suggesting a medium to good level of general motor skills.

Table 1. Results attesting the level of motor preparation of students in the ninth grade

Nr. crt.	Probe/Test Control	Sex	Barem SNE(max.)	Media București (n(b/f)=82/103)	Barem SNE(min.)
1	Long jump from the spot (m)	Boys	2,20	2,11	1,95
		Girls	1,70	1,64	1,45
2	Push-ups (rep. no.)	Boys	18	16,98	10
		Girls	10	9,31	5
3	Jumping into a far support over the goat (note)	Boys	10	8,73	5
		Girls	10	8,21	5
4	Static/dynamic acrobatic element (note)	Boys	10	9,23	5
		Girls	10	9,25	5
5	50 m speed run with a low start (sec)	Boys	7,4	7,57	7,9
		Girls	8,4	8,68	8,9
6	Spool Run 5x10 m (sec)	Boys	14,6	14,68	16,0
		Girls	17,2	17,47	18,6

In the long jump from the spot, the boys obtained an average of 2.11 m (compared to 2.20 m maximum and 1.95 m minimum), and the girls 1.64 m, values that reflect a moderate level of strength-speed. In push-ups, boys performed an average of 16.98 reps, and girls 9.31, indicating good muscle development in both genders, close to the maximum scales (18 and 10 reps.).

The gymnastics tests were evaluated by scoring: in the goat jump, the boys obtained an average of 8.73, and the girls 8.21; In the acrobatic element, the scores were close (boys – 9.23; girls – 9.25). These results indicate a good mastery of specific skills, especially in the case of acrobatic elements.

In the 50 m sprint with a low start, the boys recorded 7.57 seconds and the girls 8.68 seconds – both values close to the maximum scales, reflecting an age-appropriate travel speed. In the 5x10 m commute event, which evaluates speed-skill, the boys achieved an average of 14.68 seconds, and the girls 17.47 seconds, confirming a high level of this component.

In order to assess the level of motor skills in students in the tenth grade, the tests provided in the National Evaluation System were applied, differentiated by gender. The boys were tested in chest lifts, pull-ups on the fixed bar, two gymnastics events, 50 m running and 5x10 m commute, and the girls – in the same events, replacing the pull-ups with the long jump. Table 2 summarizes the results obtained.

Table 2. Results attesting the level of motor preparation of students in the tenth grade

N. crt.	Probe/Test Control	Sex	Barem SNE(max.)	Media București (n(b/f)=85/103)	Barem SNE(min.)
1	Lifting of the trunk from sitting on the chest (rep. no.)	Boys	16	14,13	9
		Girls	12	10,43	5
2	Fixed bar pull-ups (rep. no.)	Boys	10	8,1	5
	Long jump from the spot (m)	Girls	1,75	1,54	1,50
3	Acrobatic gymnastics: jumping (note)	Boys	10	9,01	5
		Girls	10	9,12	5
4	Acrobatic gymnastics: free exercise chosen on floor (grade)	Boys	10	8,84	5
		Girls	10	9,14	5
5	50 m speed run with a low start (sec)	Boys	7,3	7,48	7,8
		Girls	8,3	8,71	8,8
6	Spool Run 5x10 m (sec)	Boys	14,4	14,79	15,8
		Girls	17,0	17,87	18,4

The boys recorded averages close to the maximum scales, with 14.13 trunk lifts and 8.43 pull-ups, indicating a good development of abdominal strength and upper limbs. Gymnastics scores (9.01 in vaulting and 8.84 in acrobatic exercise) confirm good motor expression, while the 50 m (7.48 s) and shuttle (14.79 s) events reflect an appropriate level of speed and skill. The girls achieved 10.43 core lifts and 1.54 m in the vault, modest results compared to the maximum scales. The grades in gymnastics (9.12 and 9.14) are high, but in the speed events (8.71 s in running, 17.87 s in commuting) low values were maintained, below the expectations of age.

In order to assess the motor level of the students in the eleventh grade, the tests from the National Evaluation System were applied, reflecting the development of strength, speed and skill (Table 3).

The boys obtained good results in trunk extensions (16.47 rep.) and pushes on one leg (16.37 rep.), being significantly above the minimum scales, which denotes an advanced functional level of muscle strength. In the apparatus vault they recorded 9.21 points, and in the 50 m speed run – 7.33 seconds, both events indicating progress compared to the tenth grade.

However, in the 5x10 m (14.47 sec) commute event, a slight regression was found compared to the previous year, suggesting a stagnation in the development of speed-skill. The girls had good scores in extensions (13.06 rep.) and gymnastics (9.33), but the performances were modest in lower limb strength and movement speed (8.61 sec. at 50 m). A remarkable progress was observed in the commute test (17.12 sec.), with a clear improvement compared to the results in the tenth grade. Overall, there is a positive evolution in motor development in both sexes, but significant differences persist between boys and girls, especially in terms of strength and explosive speed.

Tabelul 3 Rezultatele ce atestă nivelul pregătirii motrice a elevilor din clasele a XI-a

N. crt.	Probe/Test Control	Sex	Barem SNE(max.)	Media București (n(b/f)=84/97)	Barem SNE(min.)
1	Extensions of the torso from facial reclining (no. rep.)	Boys	18	16,47	10
		Girls	15	13,06	7
2	Pushes on one leg resting on the fixed ladder (rep. no.)	Boys	18	16,37	10
		Girls	14	11,37	8
3	Jumping on a gymnastics machine (note)	Boys	10	9,21	5
		Girls	10	9,33	5
4	50 m speed run with a low start (sec)	Boys	7,2	7,33	7,7
		Girls	8,2	8,61	8,7
5	Spool Run 5x10 m (sec)	Boys	14,2	14,47	15,6
		Girls	16,8	17,12	18,2

The evaluation of the general motor skills of the students in the twelfth grade, carried out through the five standardized tests of the National Evaluation System (SNE), highlighted a medium to high level of physical training. Table 4.

The boys obtained averages close to the maximum scales for trunk lifts (23.26 reps.) and push-ups (24.73 reps.), confirming a progressive development of muscle strength in the high school cycle. In the gymnastics event – the apparatus jump – an average of 9.12 points was recorded, in line with the upward dynamics observed in the previous classes. Also, at the speed of movement (50 m), the boys recorded 7.27 seconds, and in the 5x10 m shuttle – 14.38 seconds, performances that indicate a good level, but with a slight setback compared to the top standards.

The girls in the twelfth grade demonstrated remarkable results in the strength tests – 22.47 repetitions in the trunk lifts and 16.33 in the push-ups – and an obvious technical mastery in the apparatus jump (9.27 points). However, at travel speed, the average of 8.53 seconds was below the minimum scale, suggesting stagnation or regression in this direction. On the other hand, in the 5x10 m shuttle (17.64 sec.), the girls showed a constant evolution, placing themselves within the limits provided by the SNE. In conclusion, there is a strengthening of strength and skill in both sexes, but gender differences persist in terms of speed development, requiring differentiated methodological interventions.

Table 4. Results attesting the level of motor preparation of students in the twelfth grades

N. crt.	Probe/Test Control	Sex	Barem SNE(max)	Media București (n(b/f)=77/112)	Barem SNE(min.)
1	Lifts of the trunk from the dorsal reclining (no. rep.)	Boys	25	23,26	17
		Girls	23	22,47	15
2	Push-ups (rep. no.)	Boys	27	24,73	19
		Girls	17	16,33	9
3	Jumping on a gymnastics machine (note)	Boys	10	9,12	5
		Girls	10	9,27	5
4	50 m speed run with a low start (sec)	Boys	7,0	7,27	7,5
		Girls	8,0	8,53	8,5
5	Spool Run 5x10 m (sec)	Boys	14,0	14,38	15,2
		Girls	16,8	17,64	18,2

The results obtained by high school students indicate a medium and medium-high general level of motor skills, with obvious gaps in force-speed and speed of movement, in both sexes. These shortcomings are confirmed by the reporting of performance to the scales of the National Evaluation System.

The differences between classes graphically highlighted suggest variations in teaching strategies and the use of motor means, which shows that the orientation towards motor

development is not sufficiently supported by adequate volumes and intensities. Thus, the achievement of a level of excellence is not systematically ensured. It is necessary to implement coherent methodological interventions to increase the efficiency of high school physical education programs.

The official recognition of the formative valences of physical education determined its inclusion in the common core of the high school framework plans, but with a reduced frequency (1-2 lessons/week). This limitation requires a rigorous selection of contents, emphasizing the need for effective methodological approaches. In this context, the research proposes the systematic capitalization of the game of rugby, integrated into the physical education lesson, as a means of motor development and formation of skills specific to the discipline.

The national curriculum offers flexibility in the choice of sports games, and rugby is provided as an alternative discipline. Its complexity allows the integrated development of motor, technical-tactical, psychological and social skills. On this basis, a methodology structured on two cycles was developed: discovery and initiation into the game of rugby, each with content adapted to the age and level of the students.

Tables 5. identifies the main skills and motor qualities developed through the specific means of rugby, emphasizing the role of coordination and force-speed.

Table 5. Specific motor skills for the fulfillment of technical elements in the game of rugby

Nr. crt.	**Name of the technical element**	**Basic and Applied Motor Skills**	**Dominant motor qualities**
1.	*Movements*	Walking, running, jumping	lower limb strength, speed of movement, coordination skills
2.	*Balloon Running*	Running, handling/transporting objects.	upper limb strength, speed of movement, endurance, coordination capabilities.
3.	*Balloon Transmission*	Throw, throw, catch	Strength-speed of the upper limbs, coordination capacities
4.	*Plywood*	Walking, pulling, carrying	Global strength, lower limb strength-velocity, coordination capabilities
5.	*Kick*	Transporting objects, throwing, catching	Strength-speed of the lower limbs, coordination capacities
6.	*Catching the balloon in flight*	Walking, jumping, grappling	Strength-speed of the upper limbs coordination abilities
7.	*Change of direction (slits)*	Walking, running, jumping	Strength-speed of the lower limbs, speed of movementcoordination abilities
8.	*Picking up the balloon from the ground*	Walking, running, carrying objects	Strength-speed of the upper limbs coordination abilities
9.	*Contact with the opponent, scrum*	Walking, pulling, carrying, crawling	Global strength, strength-velocity of the lower and upper limbs, coordination capacities
10.	*Throwing the ball and playing from the sidelines*	Throwing, launching, catching, climbing, descending, carrying	Global strength, strength-velocity of the lower and upper limbs, coordination capacities

The analysis of the data from the questionnaires addressed to teachers and physical education specialists, correlated with the results obtained in the observational experiment, outlines a clear picture of the potential efficiency of the means in the game of rugby. Over 55% of respondents consider that the level of motor training of high school students is medium, and 65% emphasize the motivating role of sports games in active participation in lessons. In addition, 96% of specialists claim that rugby means contribute significantly to the development of general and specific motor skills, being perceived as effective in all links of the lesson. However, the lack of material resources and methodical material remains an important barrier.

The results of the motor evaluations show notable differences between classes: the students in the ninth grade have an average level in strength-speed and speed, with good results in other tests. In the tenth grade, boys have difficulty with abdominal strength, and girls with long jump and speed. In grades XI-XII, the level is medium and medium-high, but deficiencies persist in the speed of movement and commuting. Girls record values below the scale in some tests.

These results suggest that, despite the application of teaching means oriented towards the development of motor skills, the performances do not reach the higher standards provided by the ENS. In this context, the application of rugby means appears as a viable solution, offering a complex framework for the physical, intellectual and behavioral development of students. Through its diversity and dynamism, rugby allows the coherent integration of the components of physical, technical-tactical and psychological training, contributing to the formation of a balanced motor profile and to the achievement of the competencies of the high school educational curriculum.

Chapter 3 "Verification and experimental argumentation of the efficiency of the application of rugby means within the education lesson with students in the tenth grade".

The pedagogical experiment aimed to verify the hypothesis according to which the capitalization of the means specific to the game of rugby in physical education lessons contributes to optimizing the level of general motor skills in high school students. Based on the findings, two classes of the tenth grade in Bucharest with comparable motor level, balanced numerical structure and similar gender distribution were selected. The experimental group, from the "Marin Preda" Theoretical High School, benefited from lessons designed based on rugby means, and the control group, from the "Aurel Vlaicu" National College, followed the traditional curriculum. The experimental design allowed the comparison of the effects of the didactic intervention on motor development, under equitable conditions, in order to validate the research hypothesis.

In continuation of the balanced structuring of the pedagogical experiment, the next stage consisted in designing the didactic approach of the physical education lesson with content specific

to the game of rugby for the experimental group. Thus, in the 2022–2023 school year, in the tenth grade of the "Marin Preda" Theoretical High School in Bucharest, the means of rugby were implemented in a coherent program, organized in five progressive modules. They aimed to develop general motor skills through applied exercises, combining content from athletics, gymnastics and rugby, depending on the available resources and the real conditions of development. The design was carried out in accordance with the national curriculum, being guided by methodological principles such as progressivity, accessibility and curricular integration, and had as its main purpose the formation of students' motor and social skills. Through this approach, the lessons have acquired a more dynamic and attractive character, contributing to the diversification of the instructional-educational process and to increasing the motivation for active participation in physical education classes.

The project of annual staggering of physical education lessons in the tenth grade integrated the means of rugby into the didactic structure, by organizing the contents in five successive modules: the development of fundamental skills (Module I), the strengthening of strength and coordination (Module II), the extended application of the means of rugby (Modules III and IV) and the fixation of the skills formed (Module V). Each module was adapted to the real conditions and correlated with the disciplines of athletics and gymnastics, aiming at the development of motor skills and educational skills. Next, we will present the thematic unit of the physical education lesson, developed based on these contents.

According to Table 5, Module I, developed over 7 weeks and structured in 13 lessons, was designed for the initiation of students in the game of rugby, aiming at the gradual development of motor skills specific to this sport. The contents included fundamental elements such as positions and movements in the game, stationary and moving passes, individual and team tactical actions, as well as the kick from the hand. The lessons were built progressively, with an emphasis on adaptability, cooperation and the formation of basic motor reflexes. Also, an initial and a final evaluation was planned, in order to analyze the effectiveness of the didactic intervention. All activities were aligned with the national curricular objectives, being adapted to the level of preparation of the students and the available resources, in order to develop the general and specific competences provided for the physical education discipline.

Table 5. The thematic unit of the physical education lesson for students in the tenth grade with the application of rugby elements. Module I

No. of the lesson	Wk./ Lesson	C.S.	Contents subject to training	Learning activities	Resource		Type of assessment(s)
					Time Allocated	Materials Used	
3-4	S1-2	1.2. 3.1. 3.2. 3.3. 4.1. 4.2. 4.3. 5.2.	- game-specific positions and movements; - Getting used to the balloon; - Balloon passing.	- Exercises for fundamental attack and defense positions; - Exercises for movements specific to the game of rugby; - Exercises to accommodate the rugby ball; - Exercises for carrying the rugby ball; - Exercises for passing the ball from the spot and away.	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Initial assessment
5-6	S3		- attack and defense positions; - Change of direction and travel - passing the ball away.	- Exercises for attack and defense positions, specific movement; - Exercises to accommodate the rugby ball; - Exercises for picking up and carrying the rugby ball; - Exercises for changing direction; - Exercises for passing the ball from the spot and away to two players; - Exercises for player marking	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Continuous evaluation
7-8	S4		- Positions and movements - passing the ball away to 2-3 players; - Individual tactical actions	- Exercises for attack and defense positions, movement and accommodation with the ball; - Exercises for carrying the ball with one hand and two; - Exercises for passing the ball from the spot and away to two to three players; - Exercises for blocking the opponent; - Exercises for practicing the tactical action "crossing"; - Exercises for the defense action "changing the opponent".	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Continuous evaluation
9-10	S5		- movements with passing the ball to 2-4 players; - individual tactical actions in attack and defense.	- Exercises for movements with and without a balloon, changes of direction; - Exercises for passing the ball away; - Exercises for passing the ball to three to four players; - Exercises for practicing "jumping" and "crossing" tactical action; - Exercises for the defensive action "changing the opponent" and blocking adv.; - Exercises for defensive action "in numerical inferiority".	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Continuous evaluation
11-12	S6		- kick from the hand - individual tactical actions in attack and defense.	- Exercises for passing the ball to three to four players; - Exercises for practicing "jumping" and "crossing" tactical action; - Exercises for practicing the kick from the hand"; - Exercises for previously learned attack and defense actions; - Application paths with the application of the elements previously learned.	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Continuous evaluation
13-14	S7		- Assessment of motor skills specific to the game of rugby	***Rugby specific tests:*** - lateral pass and jump pass; - ground pass; - change of direction; - speed and skill; - change of direction; - low shot and collection and passing speed.	17′-22′ pentru o activitate	-whistle -timer - Rugby balls - milestones	Initial testing

Analysis of the motor preparation indices of the students in the tenth grade included in the formative experiment (boys)

In the pedagogical experiment carried out in the tenth grade, the analysis of motor training aimed to compare the performances between the experimental and control groups, in two test stages (initial and final). The assessment included tests of strength, coordination, speed and skill, using the same standardised tools and conditions (Table 6).

The results obtained by the boys in the experimental group reveal statistically significant progress in all tests, especially in the strength tests (trunk lifts and pull-ups), where there were increases of 3.18 and 2.92 repetitions ($P < 0.001$). Progress is supported by considerably higher 't' test values compared to the control group.

Table 6. The results of the initial and final motor training of the students in the tenth grade, boys (experimental group: n=11; control group: n=11).

N. crt.	Control Standard	Gr.	Testing Initial	Testing Final	t	P
1.	Lifts of the trunk from sitting on the gymnastics box (rep. no.)	**E**	12,72± 0,67	15,90±0,38	**6,10**	**<0,001**
		M	14,27± 0,38	14,87±0,29	**3,40**	**<0,01**
			t_1 = 2,02 P > 0,05	**t_2 = 2,17 P < 0,05**		
2.	Pull-ups on the fixed bar – boys (rep. no.)	**E**	6,90± 0,48	9,82±0,19	**7,56**	**<0,001**
		M	7,45± 0,57	9,09±0,29	**4,85**	**<0,001**
			t_1 = 0,74 P > 0,05	**t_2 = 2,13 P < 0,05**		
3.	Acrobatic gymnastics: jumping (note)	**E**	8,54± 0,38	9,81±0,10	**3,86**	**<0,01**
		M	8,81± 0,29	9,32±0,19	**3,60**	**<0,01**
			t_1 = 0,57 P > 0,05	**t_2 = 2,12 P < 0,05**		
4.	Acrobatic gymnastics: Chosen free exercise on the floor (note)	**E**	9,18±0,19	9,9±0,10	**4,78**	**<0,001**
		M	9,36±0,19	9,45±0,19	**0,64**	**> 0,05**
			t_1 = 0,67 P > 0,05	**t_2 = 2,12 P < 0,05**		
5.	50 m speed run with a low start (sec)	**E**	7,50± 0,10	7,11±0,07	**4,77**	**<0,001**
		M	7,42± 0,11	7,36±0,09	**1,13**	**>0,05**
			t_1 = 0,52 P > 0,05	**t_2 = 2,31 P < 0,05**		
6.	Shuttle 5x10 m (sec)	**E**	14,70±0,17	14,10±0,10	**4,47**	**<0,001**
		M	14,52±0,11	14,43±0,10	**1,79**	**>0,05**
			t_1 = 0,88 P > 0,05	**t_2 = 2,34 P < 0,05**		

Notă: E – grupa experimentală (cl. a X-a LT Marin Preda) M – grupa martor (cl. a X-a CT Aurel Vlaicu)
n=11, f – 10, P – 0.05; 0,01; 0,001. n=22, f – 20, P – 0.05; 0,01; 0,001.
t_1, t_2 – 2,228; 3,169; 4,587 t – 2,086; 2,845; 3,850

In the acrobatic gymnastics events, such as the vault and the floor exercise, the experimental group recorded superior improvements: 1.27 points compared to 0.51 in the first event ($P < 0.01$), respectively 0.72 points compared to 0.09 in the second ($P < 0.001$), indicating a clear evolution of coordination and motor expressiveness.

In the speed test (50 m), the average time of the experimental group decreased from 7.50 s to 7.11 s ($P < 0.001$), while in the control group the progress was insignificant. Similar results were

recorded in the 10x5 m commute test, where the improvement of the experimental group was significant (P < 0.001), unlike the control group (P > 0.05). In conclusion, the data confirm the methodological effectiveness of rugby content applied in physical education lessons, reflected in the overall improvement of boys' motor skills, especially in terms of strength, coordination and speed. These advances validate the research hypothesis on the formative value of rugby means in the high school educational context.

Analysis of the indices of motor preparation of girls in the tenth grade in the experiment

The final results obtained by the girls in the experimental and control groups show a different progress than that recorded by the boys, with significantly more pronounced evolutions in the case of the experimental group (Table 7). Thus, in all six motor tests applied, the girls in the experimental group obtained statistically significant improvements (P < 0.001 in most cases), unlike the control group, where progress was lower and, in some cases, statistically insignificant (P > 0.05).

Table 7. The results of the initial and final motor training of the students in the tenth grade, girls (experimental group: n=18; control group: n=17).

N. crt.	Control Standard	Gr.	Testing Initial	Testing Final	T	P
1.	Lifts of the trunk from sitting on the gymnastics box (rep. no.)	**E**	10± 0,26	11,54±0,06	**7,15**	**<0,001**
		M	10,11± 0,39	10,94± 0,20	**3,71**	**<0,01**
			t_1 = 0,27 P > 0,05	**t_2 = 2,88 P < 0,01**		
2.	Pull-ups on the fixed bar – boys (rep. no.)	**E**	1,49± 0,03	1,64± 0,03	**6,72**	**<0,001**
		M	1,48± 0,04	1,54± 0,04	**2,06**	**> 0,05**
			t_1 = 0,20 P > 0,05	**t_2 = 2,05 P < 0,05**		
3.	Acrobatic gymnastics: jumping (note)	**E**	8,72± 0,19	9,98± 0,06	**8,26**	**<0,001**
		M	8,64± 0,2	9,16± 0,20	**3,75**	**<0,01**
			t_1 = 0,31 P > 0,05	**t_2 = 3,94 P < 0,01**		
4.	Acrobatic gymnastics: Chosen free exercise on the floor (note)	**E**	9,33±0,13	9,94±0,06	**6,60**	**<0,001**
		M	9±0,27	9,48±0,07	**2,17**	**<0,05**
			t_1 = 1,14 P > 0,05	**t_2 = 5,28 P > 0,001**		
5.	50 m speed run with a low start (sec)	**E**	8,88± 0,16	8,32± 0,12	**5,15**	**<0,001**
		M	8,77± 0,11	8,62± 0,11	**2,03**	**>0,05**
			t_1 = 0,63 P > 0,05	**t_2 = 2,05 P > 0,05**		
6.	Shuttle 5x10 m (sec)	**E**	17,51±0,16	16,78± 0,13	**6,70**	**<0,001**
		M	17,72±0,21	17,25± 0,16	**3,38**	**<0,01**
			t_1 = 0,82 P > 0,05	**t_2 = 2,41 P < 0,05**		

Notă: E – grupa experimentală (cl. a X-a LT Marin Preda) M – grupa martor (cl. a X-a CT Aurel Vlaicu)
n=18, f – 17, P – 0.05; 0,01; 0,001. n=17, f – 16, P – 0.05; 0,01; 0,001.
t_1 – 2,110; 2,898; 3,965 t_2 – 2,120; 2,921; 4,015
n=35, f = 33, t – 2,036; 2,749; 3,617

In the abdominal strength test (trunk lifts), the experimental group recorded an average increase of 1.54 repetitions ($t = 7.15$), while the control group progressed with only 0.83 repetitions ($t = 3.71$). In the long jump from the spot, the test that reflects the explosive force, the girls in the experimental group improved the result by 0.15 m ($P < 0.001$), and the control group by only 0.06 m, a statistically irrelevant progress ($P > 0.05$).

As for acrobatic gymnastics, both in jumping and floor exercise, the students in the experimental group recorded obvious increases in performance (of over 1 point), compared to the more moderate progress of the control group. In the chosen free exercise, the difference between the initial and final scores was 0.61 points (experimental) vs. 0.48 (control), with a "t" index of 6.60 ($P < 0.001$) versus 2.17 ($P < 0.05$).

In the speed tests (50 m and 5x10 m shuttle), the girls in the experimental group recorded significant decreases in times (−0.56 s and −0.73 s, respectively), while the control group progressed by −0.15 s and −0.47 s, these improvements being statistically significant only in the commute test. In conclusion, the data reveal that the systematic integration of rugby content favored the significant development of general and specific motor skills in the girls in the experimental group. The positive evolution, statistically validated, supports the hypothesis of the research on the formative impact of the game of rugby in the physical education lesson for high school students.

The dynamics of the indices of the technical-tactical training specific to the game of rugby in the students of the tenth grade

In order to evaluate the efficiency of the means specific to the game of rugby applied in physical education lessons, six technical-tactical tests were analyzed, administered to the experimental group at the beginning and end of the school year. The tests – lateral step and jump pass, ground pass, change of direction, speed and skill, low shot with collection, passing speed – were chosen for their practical relevance in the game of rugby (Table 8).

The results, statistically analyzed, indicated significant improvements in all indicators, for both sexes. In the "lateral step and jump pass" test, the boys progressed from 5.31s to 4.81s ($t=4.17$; $P<0.01$), and girls from 6.58s to 5.23s ($t=8.92$; $P<0.001$). In the "ground pass", the progress was 1.02s in boys and 1.36s in girls, both of which were statistically high. The "change of direction" test revealed decreases in execution time of 0.32s (boys) and 1.06s (girls), confirmed by $t>4.00$ ($P<0.001$). Notable improvements were also recorded in the "speed and skill" and "grazing shot and collection" tests, where the t-values exceeded 4.70 for both sexes.

As for the passing speed, there was an increase in the number of correct passes in a fixed interval, from 11.61 to 12.72 in boys and from 9.58 to 11.05 in girls – statistically confirmed progress.

All t-values exceeded the established critical thresholds (P<0.05 – P<0.001), which validates the hypothesis of the efficiency of the means applied. The progress confirms the significant contribution of rugby-inspired exercises in the technical-tactical and general motor development of high school students.

Table 8. Indices of the initial and final technical-tactical training of the students in the tenth grade (boys n=11) (girls n=18)

			Boys				**Girls**			
N. crt.	**Norme de control**	**Date stat.**	**Indicii inițiali**	**Indicii finali**	**t**	**P**	**Indicii inițiali**	**Indicii finali**	**t**	**P**
1.	Lateral pass and jump pass (sec)	**X_{med}**	**5,31**	**4,81**	**4,17**	**<0,01**	**6,58**	**5,23**	**8,92**	**<0,001**
		m	± 0,16	±0,09			± 0,18	±0,11		
		σ	0,54	0,29			0,75	0,45		
		CV	10,22	6,03			11,36	8,56		
2.	Ground Pass (sec)	**X_{med}**	**10,71**	**9,69**	**5,89**	**<0,001**	**12,14**	**10,78**	**6,19**	**<0,001**
		m	± 0,24	±0,19			± 0,25	±0,17		
		σ	0,81	0,62			1,07	0,74		
		CV	10,32	6,35			8,80	5,89		
3.	Change of direction (sec)	**X_{med}**	**6,3**	**5,98**	**4,39**	**<0,01**	**7,59**	**6,53**	**8,98**	**<0,001**
		m	± 0,21	±0,13			± 0,14	±0,09		
		σ	0,68	0,43			0,58	0,38		
		CV	10,32	7,12			7,60	5,89		
4.	Speed and Skill (sec)	**X_{med}**	**24,16**	**22,76**	**4,86**	**<0,001**	**25,52**	**23,95**	**5,75**	**<0,001**
		m	± 0,39	±0,21			± 0,30	±0,24		
		σ	1,31	0,70			1,29	1,02		
		CV	5,41	3,09			5,06	4,24		
5.	Change of direction, low shot (sec)	**X_{med}**	**6,07**	**5,44**	**4,79**	**<0,001**	**7,06**	**6,12**	**7,96**	**<0,001**
		m	±0,13	±0,08			±0,14	± 0,08		
		σ	0,43	0,25			0,58	0,36		
		CV	7,02	4,58			8,25	5,84		
6.	Passing speed (sec)	**X_{med}**	**11,61**	**12,72**	**3,94**	**<0,01**	**9,58**	**11,05**	**5,04**	**<0,001**
		m	±0,38	±0,19			±0,32	± 0,26		
		σ	1,26	0,63			1,37	1,10		
		CV	10,87	4,96			14,34	9,94		

Notă: (b) n=11, f – 10, P – 0.05; 0,01; 0,001. t – 2,228; 3,169; 4,587

(f) n=18, f – 17, P – 0.05; 0,01; 0,001. t – 2,110; 2,898; 3,965

The impact of the physical education lesson with rugby content on the motivation to practice motor activities

The data obtained from the experimental research confirmed not only the efficiency of rugby means in the development of general motor skills, but also their impact on the students' motivation for active participation in motor activities. The physical education lesson has, in addition to the formative dimension, also an orientation role, helping to stimulate interest in practicing movement in and out of school, which supports the promotion of an active lifestyle. In this regard, we analyzed the participation of students in physical education classes during a school

year, comparing the situation in the ninth grade (before the intervention) with that in the tenth grade (during the implementation of the program with rugby content). The absence record, structured on five modules, reflected significant changes: in the experimental group, the total number of absences decreased from 56 to 37, and in the control group, the reduction was minor, from 61 to 58 (Figure 1).

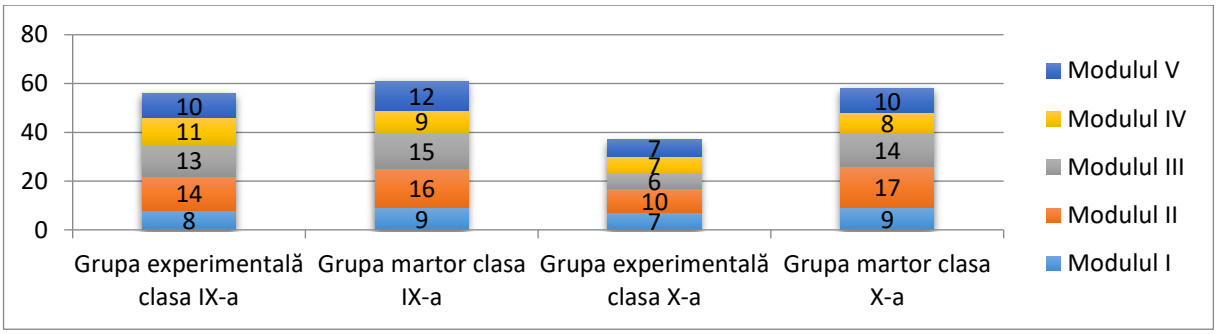

Figure 1. Absences from the physical education class of the students included in the pedagogical experiment

This positive evolution among the experimental group was found in all modules. For example, in module II (gymnastics), absences decreased from 14 to 10, and in module III (basketball), from 13 to only 6. By contrast, in the control group, attendance remained constant or worsened, indicating a low influence of traditional content on student motivation. In addition, data on students' participation in extracurricular sports activities were also analyzed. According to the teacher's notebook, in the experimental group there was an increase in the number of students involved in extracurricular activities from 10 (34.5%) to 14 (48.3%). Students opted for new sports, including rugby, indicating an increased openness to other forms of movement. In the control group, the increase was modest – from 9 (32.1%) to 10 (35.7%) (Figure 2)

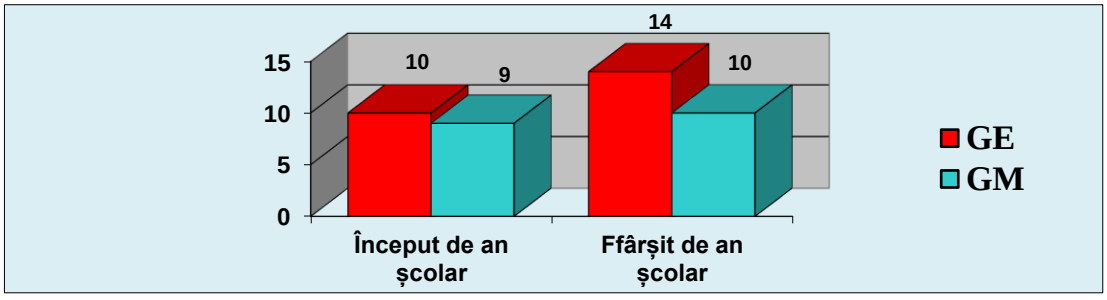

Figure 2. Tenth grade students involved in sports training activities

These data support the hypothesis that integrating rugby means into physical education lessons increases the attractiveness of classes and contributes to increasing active participation. The decrease in absences and the extension of involvement in extracurricular activities reflect a higher level of motivation among the students in the experimental group.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. Following the analysis of the specialized bibliographic sources on physical education for high school students, it is found that the organization and conduct of lessons is constantly changing, researchers being constantly concerned with identifying solutions to streamline the educational process. Many specialized works address new methods and forms of organizing the physical education lesson, as well as complementary contents, with the common goal of motivating students to practice sports and positively influencing the level of motor development.

2. The flexible curriculum for the discipline of physical education in the high school cycle allows the personalization of the didactic approach and offers the teacher the opportunity to select and apply various means from sports events in order to form basic motor skills and abilities, as well as to stimulate motor qualities corresponding to the age particularities of the students. Adolescence is considered the sensitive period for the development of motor skills, marking the optimal stage for the manifestation of basic motor skills and the maximum development of psychomotor qualities.

3. The game of rugby, through its formative valences and high degree of complexity, offers a solid basis for structuring the educational process through various methods and means, adapted to multiple learning contexts. They contribute to the formation of the general competences of the physical education discipline and exert a positive influence on the development of general motor skills in high school students.

4. The results of the opinion questionnaire completed by specialists in physical education and rugby indicate that the level of motor training of high school students is perceived, in over 55% of cases, as medium, and in over 14% – low. At the same time, 96% of respondents believe that the inclusion of rugby means in physical education lessons contributes substantially to the development of general motor skills and specific motor skills, as well as to increasing the attractiveness of the lesson.

5. The results of the observational experiment reveal that the motor preparation indices of students in the ninth – twelfth grades are, in general, higher than the minimum scale of the National Evaluation System, but lower than the maximum scale. Variations are observed from one class to another, with downward trends, especially in girls, in the upper classes and in the speed events. These findings confirm the need to implement programs that support motor development adapted to the age level and particularities of students.

6. The in-depth study on the structure and applicability of the means specific to the game of rugby in physical education lessons (subchapter 2.4), corroborated with the didactic design carried out within the pedagogical experiment (subchapter 3.1), confirms the fact that the systematic

inclusion of rugby content in the educational approach contributes not only to the diversification of the instructional-formative process, but also to its improvement. The rigorous design of the contents and learning activities has ensured continuity, progressivity and methodological coherence, and the application of these means in the current physical education lessons has created favorable conditions for the integrated development of students' skills and motor skills.

7. The application of rugby means in the physical education lesson to students in the tenth grade, based on a scientifically based didactic design adapted to the curricular requirements, has led to remarkable results in terms of improving the level of motor preparation. The students in the experimental group benefited from a coherent and specific program, which stimulated motor development through varied, progressive means adapted to the particularities of age and initial level of preparation. Following the tests, they recorded statistically significant increases ($P < 0.01$ and $P < 0.001$), compared to the control group, where the progress was moderate or insignificant ($P < 0.05$ and $P > 0.05$). These findings confirm the effectiveness of rugby means when they are methodically implemented in physical education lessons, in order to develop general motor skills.

8. The dynamics of the technical-tactical training indices specific to the game of rugby, obtained in the test applied only to the experimental group, indicates significant progress in all the parameters analyzed. The positive evolution of the students' results – both boys and girls – in the six technical-tactical tests, supported by statistically significant values ($P < 0.01$ and $P < 0.001$), confirms the fact that the methodical application of these means has contributed to the development of rugby-specific skills, but also to the consolidation of general and specific motor skills.

9. The analysis of the students' motivation level for practicing motor activities showed a clear progress in the case of the experimental group, following the application of the program with rugby means. These students recorded a significant decrease in the number of absences from physical education lessons and an increase in participation in extracurricular sports activities, compared to both the previous year and the control group. This fact confirms the positive influence of rugby media on the active involvement and motivation of students for motor activity, both in the curricular and extracurricular framework.

Following the analysis of the results obtained after the basic experiment, it was found that ***the important scientific problem solved*** in the field consists in streamlining the teaching-learning-evaluation process of the physical education discipline at high school level, by achieving a coherent didactic design, based on the application of the means specific to the game of rugby. Their implementation led to an increase in the efficiency of the lessons and, directly, to the development of the students' general motor skills.

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As a result of the organization and conduct of the research on the application of rugby means in the physical education lesson to high school students, in order to optimize the level of development of general motor skills, as well as following the analysis, synthesis and processing of the data obtained, the following general practical-methodical recommendations are formulated:

- The didactic design of the physical education lesson in high school classes must efficiently and comprehensively integrate the means of the game of rugby, chosen according to the thematic objectives, the age particularities and the level of preparation of the students. This involves a careful structuring of teaching methods and means, adapted to the real context and oriented towards the formation of specific competences.
- Skill (coordination capacity) is one of the most demanded motor qualities in the game of rugby. It is recommended that in the training process the initial emphasis be placed on the development of this capacity, as a foundation for learning and consolidating technical-tactical skills.
- The selection of rugby means must be made in accordance with the theme of the lesson, the proposed objectives, the material conditions, the individual particularities of the students (age, level of motor skills, previous experience), as well as according to the season (lessons held on the field or in the hall).
- The development of the student's motor skills through the means of rugby can be initiated as early as the discovery stage of the game, with the beginning of the school year. The volume and intensity of the activities will be adapted according to the initial level of the students and the educational purposes of each lesson.
- It is recommended that, in the first stage of the application of rugby means, the development of coordination skills should be emphasized, progressively following the development of the other motor qualities: mobility, speed, endurance, and in the advanced stage – strength.
- The exercises specific to the game of rugby will be introduced gradually, from simple to complex forms, respecting the principles of progressivity, accessibility and individualization of effort.
- It is advisable to combine the means of rugby with those of other sports disciplines, such as athletics, gymnastics, aerobics, etc., to increase the efficiency of lessons and diversify students' motor experiences.
- It is recommended to use non-standard materials (medicine balls, balls from other games: volleyball, basketball, tennis, etc.), especially in the initial phases of training, in order to adapt the difficulty of the effort and to facilitate the acquisition of specific skills in various conditions.

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ADNOTARE

Udroiu Marian, „*Creșterea motricității generale a elevilor din ciclul liceal prin aplicarea mijloacelor din rugby”*

Teză de doctor în ştiinţe ale educației. Chișinău, 2025.

Structura tezei: introducere, 3 capitole, concluzii şi recomandări, bibliografie 184 surse, 172 pagini, text de bază 136 pagini, 17 tabele, 41 figuri, 6 anexe. Rezultatele experimentale obţinute sunt publicate în 6 lucrări ştiinţifice.

Cuvinte-cheie: elevi, liceu, lecţie de educaţie fizică, motricitate generală, mijloace din rugby.

Scopul cercetării constă în dezvoltarea motricității generale a elevilor de liceu prin aplicarea mijloacelor din jocul de rugby în lecțiile de educație fizică, în vederea eficientizării procesului educațional și realizării finalităților educaționale ale disciplinei.

Obiectivele cercetării: 1. Analiza literaturii de specialitate privind organizarea procesului educațional la disciplina educație fizică a elevilor din liceu. 2. Determinarea nivelului pregătirii motrice a elevilor din liceu din România. 3. Proiectarea și implementarea mijloacelor din jocul de rugby în cadrul lecțiilor de educație fizică cu elevii din clasa a X-a. 4. Argumentarea experimentală a eficienței lecţiei de educaţie fizică prin aplicarea mijloacelor din rugby cu elevii din liceu.

Noutatea și originalitatea științifică: constă în proiectarea didactică inovatoare a lecției de educație fizică, prin integrarea mijloacelor specifice jocului de rugby ca instrumente metodice orientate spre dezvoltarea motricității generale a elevilor de liceu. Aplicarea corectă și contextualizată a acestor mijloace contribuie la eficientizarea procesului instructiv-educativ, facilitând realizarea finalităților curriculare ale disciplinei și adaptarea acestora la particularitățile motivaționale și funcționale ale adolescenților.

Problema științifică actuală soluționată constă în eficientizarea procesului de predare-învățare-evaluare a disciplinei educație fizică din clasele liceale prin realizarea corespunzătoare a proiectării didactice prin prisma aplicării mijloacelor din jocul de rugby, în scopul creșterii eficienței lecției dar și a dezvoltării motricității generale a elevilor.

Semnificația teoretică a lucrării constă în fundamentarea științifică a unui demers didactic inovator, prin care lecția de educație fizică este eficientizată și diversificată prin aplicarea mijloacelor specifice jocului de rugby, adaptate particularităților elevilor de liceu. Studiul contribuie la extinderea cadrului teoretic privind formarea motricității generale, oferind noi perspective asupra utilizării sporturilor colective ca resurse educaționale în procesul formare a competențelor specifice disciplinei

Valoarea aplicativă a lucrării. The results obtained in the course of this research can serve as a methodological and practical benchmark for physical education teachers, providing scientific support in: the didactic design of lessons adapted to curricular requirements and the specific characteristics of high school students; the efficient organization of the educational process through the conscious and functional integration of rugby-specific means; and the valorization of rugby’s formative potential for the development of general motor skills through specific, coherent, and applicable activities in diverse educational contexts.

Implementarea rezultatelor ştiinţifice. Rezultatele obținute din cadrul cercetărilor efectuate au fost implementate în licee din România și publicate în reviste de specialitate, conferințe și simpozioane științifice naționale și internaționale.

ANNOTATION

Udroiu Marian, „*Increasing the general motor skills of high school students through the application of rugby means”,*
PhD thesis in educational sciences. Chisinau, 2025.

Structure of the thesis: introduction, 3 chapters, conclusions and recommendations, bibliography 184 sources, 172 pages, basic text 136 pages, 17 tables, 41 figures, 6 annexes. The obtained experimental results are published in 6 scientific papers.

Keywords: students, high school, physical education lesson, general motor skills, rugby equipment.

Purpose of the research is to develop the general motor skills of high school students by applying the means of the rugby game in physical education lessons, in order to streamline the educational process and achieve the educational objectives of the discipline.

Objectives of the research: 1. Analysis of specialized literature regarding the organization of the educational process in the physical education discipline of high school students. 2. Determining the motor training level of high school students in Romania. 3. The design and implementation of the means of the game of rugby in the physical education lessons with the 10th grade students. 4. Experimental argumentation of the effectiveness of the physical education lesson by applying the means of rugby to high school students.

Scientific novelty and originality: consist in the innovative didactic design of the physical education lesson by integrating the specific means of the rugby game as methodological tools aimed at developing the general motor skills of high school students. The correct and contextualized application of these means contributes to streamlining the instructional-educational process, facilitating the achievement of the curricular objectives of the discipline and their adaptation to the motivational and functional particularities of adolescents.

Current scientific problem solved consists in increasing the efficiency of the teaching-learning-evaluation process in physical education for high school classes through the appropriate design of the didactic approach, by applying the means specific to the game of rugby. This aims both at improving the effectiveness of the lesson and at developing the general motor skills of students.

Theoretical importance: in the scientific foundation of an innovative didactic approach, through which the physical education lesson is optimized and diversified by applying rugby-specific means, adapted to the particularities of high school students. The study contributes to the expansion of the theoretical framework regarding the development of general motor skills, offering new perspectives on the use of team sports as educational resources in the process of forming discipline-specific competencies.

Applicative value of the paper. The obtained results can be a benchmark for physical education teachers for: didactic design and efficient organization of the educational process in the discipline; the effective use of rugby equipment in physical education lessons; the development of general motor skills through the prism of specific rugby equipment.

Implementation of scientific results. The results obtained from the conducted research were implemented in high schools in Romania and published in specialized journals, conferences and national and international scientific symposia.

АННОТАЦИЯ

Удрою Мариан, *«Развитие общей моторики учащихся старших классов через применение средств регби»*, диссертация на соискание ученой степени доктора педагогических наук. Кишинёв, 2025.

Объем и структура работы: Работа включает, введение, 3 главы, выводы и рекомендации, библиография из 184 источников, 172 страницы, основной текст — 136 страниц, 17 таблиц, 41 рисунок, 6 приложений. Экспериментальные результаты опубликованы в 6 научных статьях.

Ключевые слова: учащиеся старших класс, урок физического воспитания, общая моторика, средства регби.

Цель исследования заключается в развитии общей моторики учащихся старших классов через применение средств игры в регби на уроках физического воспитания с целью повышения эффективности учебного процесса и достижения образовательных целей дисциплины.

Задачи исследования: 1. Анализ научной литературы по организации учебного процесса на уроках физического воспитания в старших классах. 2. Определение уровня моторной подготовки учащихся старших классов в Румынии. 3. Проектирование и внедрение средств игры в регби в уроки физического воспитания с учащимися 10-х классов. 4. Экспериментальное обоснование эффективности уроков физического воспитания с применением средств регби у старшеклассников.

Научная новизна и оригинальность заключаются в инновационном дидактическом проектировании урока физического воспитания путём интеграции специфических средств игры в регби как методических инструментов, направленных на развитие общей моторики учащихся старших классов. Корректное и контекстуальное применение этих средств способствует повышению эффективности учебно-воспитательного процесса, достижению целей учебной программы и их адаптации к мотивационным и функциональным особенностям подростков.

Актуальная научная проблема, решённая в исследовании, заключается в повышении эффективности процесса обучения, преподавания и оценки на уроках физического воспитания в старших классах путём целенаправленного дидактического проектирования и применения средств игры в регби с целью повышения эффективности уроков и развития общей моторики учащихся.

Теоретическая значимость работы состоит в научном обосновании инновационного дидактического подхода, благодаря которому уроки физического воспитания становятся более эффективными и разнообразными за счёт использования средств регби, адаптированных к особенностям учащихся старших классов. Исследование расширяет теоретические рамки формирования общей моторики, предлагая новые подходы к использованию командных видов спорта как образовательного ресурса в процессе формирования предметных компетенций.

Прикладная ценность исследования. Полученные результаты могут служить методологическим ориентиром для преподавателей физического воспитания, обеспечивая научную основу для дидактического проектирования уроков, адаптированных к учебной программе и особенностям старшеклассников; эффективной организации учебного процесса путём осознанного и функционального включения средств регби; и использования их формирующего потенциала для развития общей моторики в различных образовательных контекстах.

Внедрение научных результатов. Результаты, полученные в ходе исследования, были внедрены в лицеи Румынии и опубликованы в специализированных журналах, на конференциях и научных симпозиумах национального и международного уровня.

UDROIU MARIAN

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