PODIUM
Journal of Science and Technology in Physical Culture

UNIVERSITY EDITORIAL

Volumen 17
Issue 3
2022

University of Pinar del Río "Hermanos Saíz Montes de Oca"

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ISSN: 1996–2452 RNPS: 2148
PODIUM Journal, September-December 2022; 17(3):860-875

Translated from the original in Spanish

Original article

Games for the treatment of spatial orientation in Physical Education classes

Juegos para el tratamiento de la orientación espacial en las clases de Educación Física

Jogos para o tratamento da orientação espacial nas aulas de Educação Física

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Received: 2021/07/09
Approved: 2022/06/22

How to cite item: Tamayo Rodríguez, R., Fernández Yero, L., & Vázquez Rodríguez, S. (2022). Games for the treatment of spatial orientation in Physical Education classes/Juegos para el tratamiento de la orientación espacial en las clases de Educación Física. PODIUM - Journal of Science and Technology in Physical Culture, 17(3), 860-875. Retrieved from https://podium.upr.edu.cu/index.php/podium/article/view/1164

ISSN: 1996–2452 RNPS: 2148
PODIUM Journal, September-December 2022; 17(3):860-875

ABSTRACT

Introduction: The game in boys and girls occurs in a natural way because it is used as a means of preparation for life and as a means of education. That is why many authors state categorically that "the child learns by playing and by playing he becomes fit for life".
Objective: This research has as objective to elaborate a set of adapted games to favor the work with spatial orientation in boys and girls from the " *Antonio Briones Montoto" primary school in* the Bayamo municipality, from which a sample of 24 first grade students enrolled in the primary school who have problems in spatial orientation was taken as an object of study.
Materials and methods: In order to fulfill the objective, theoretical methods (analytical-synthetic, hypothetical-deductive and documentary review) , empirical (observation, survey, experiment and *test to evaluate* spatial orientation) and statistical mathematical methods were used. .
Results: As a result, six adapted games are offered in correspondence with the particularities of the studied population, which will allow the work with the spatial orientation of the mentioned population.
Conclusion: The analyzed theoretical and methodological foundations allowed determine and adapt the games to favor the development of the spatial orientation in the Physical education class.

Keywords: Physical education; Children games; Spatial orientation.

RESUMEN

Introducción: El juego en los niños y niñas se produce de una forma natural porque este se utiliza como un medio de preparación para la vida y como un medio de educación. Es por ello que muchos autores refieren de manera categórica que "el niño aprende jugando y jugando se hace apto para la vida".
Objetivo: La presente investigación tiene como objetivo elaborar un conjunto de juegos adaptados para favorecer el trabajo de la orientación espacial en niños y niñas de la escuela primaria "*Antonio Briones Montoto"* del municipio Bayamo, de la cual se tomó una muestra representativa de 24 estudiantes que cursan el primer grado y presentan problemas en la orientación espacial.
Materiales y métodos: En aras de dar cumplimiento al objetivo, se emplearon métodos teóricos (analítico-sintético, hipotético-deductivo y revisión documental), empíricos (observación, encuesta, experimento y *test* para evaluar la orientación espacial) y estadísticos matemáticos.
Resultados: Como resultado se ofrecen seis juegos adaptados en correspondencia con las particularidades de la población estudiada, los cuales permitirán favorecer el trabajo de la orientación espacial de dicha población.
Conclusiones: Los fundamentos teóricos y metodológicos analizados permitieron determinar y adaptar los juegos para favorecer el desarrollo de la orientación espacial en la clase de Educación Física.

Palabras clave: Educación Física; niños; juegos; Orientación espacial.

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RESUMO

Introdução: A brincadeira em meninos e meninas ocorre de forma natural, pois é utilizada como meio de preparação para a vida e como meio de educação. É por isso que muitos autores afirmam categoricamente que "a criança aprende brincando e brincando torna-se apta para a vida".
Objetivo: O objetivo desta pesquisa é desenvolver um conjunto de jogos adaptados para favorecer o trabalho de orientação espacial em meninos e meninas da escola primária "Antonio Briones Montoto" no município de Bayamo, do qual foi retirada uma amostra representativa de 24 alunos .que frequentam a primeira série e apresentam problemas de orientação espacial.
Materiais e métodos: Para cumprir o objetivo foram utilizados métodos teóricos (analítico-sintético, hipotético-dedutivo e revisão documental), métodos empíricos (observação, levantamento, experimento e teste para avaliar a orientação espacial) e estatística matemática.
Resultados: Como resultado, são oferecidos seis jogos adaptados em correspondência com as particularidades da população estudada, o que permitirá favorecer o trabalho de orientação espacial dessa população.
Conclusões: Os fundamentos teóricos e metodológicos analisados permitiram determinar e adaptar os jogos para favorecer o desenvolvimento da orientação espacial na aula de Educação Física.

Palavras-chave: Educação Física; Crianças; Jogos; Orientação espacial.

INTRODUCTION

Physical Education is an important part of the integral formation of man, which fundamental agent is physical exercise and as a discipline it is part of the pedagogical process. This has as its specific purpose the development of the physical performance capacity of the individual based on the morphological and functional improvement of the organism. In addition, it includes in its content the training and improvement of their motor skills, the acquisition of knowledge and the development of convictions, in such a way that they are in a position to fulfill all the tasks that society indicates. This discipline is also that part of the activity that, developed through voluntary and precise movements, improves the physiological, psychological, moral, aesthetic and social spheres. On the other hand, this area improves the temperamental potential, in addition to reinforcing and educating the character, which contributes, during the evolutionary age, to the formation of a better personality of the future man.

In Cuba, Physical Education, like other disciplines, has been immersed in the incessant search for scientific arguments that allow achieving an infallible comprehensive education of the new generations. In this way, it is placed on a par with the intellectual or theoretical preparation necessary for students as part of the training actions of the school curriculum. The objective of this is the integral and harmonic formation of the personality and that the child reaches a level of emotional satisfaction in correspondence with contemporary needs. This originates as a consequence of the development obtained until now and of the historical, political and social context of Cuba.

That is why the objectives of Physical Education show the personality as a whole, the improvement of physical abilities and, at the same time, the formation of conscience, character and behavior. This comprehensive approach means that Physical Education cannot be reduced simply to the strengthening of muscles and organs, which is important, but that its tasks are aimed at what is essential, which is man as a social being. This is attributed to the dialectical interrelation of knowledge, motor skills, physical abilities and mental qualities to achieve adequate physical performance capacity in accordance with age and sex.

In prehistoric times, man saw the need to subsist in the environment that surrounded him, based on his own efforts to feed himself; it was developing hunting, fishing, fruit gathering and other physical activities to defend itself against its enemies and predators, such as: running, throwing, jumping, climbing, swimming, among others.

All these activities bring with them the development of physical capacities according to other authors who have worked on this topic such as Mirella (2016), Campillo (2018). These activities are developed in the development of physical capacities; not only strength predominates, but also that its development has a high psychological component in the personality, which allows certain types of activities to be carried out successfully.

Julián Pérez Porto and Ana Gardey (2021) define physical capacities as the conditions presented by an organism, generally associated with the development of a certain activity or action. These physical abilities are determined by genetics, although they can be perfected through training.

Authors such as Casimiro, Delgado and Cornelio (2014); Jiménez and Montil (2016), Illescas and Alfaro (2017) state that physical capacities are present in all activities carried out by man from the physical point of view and they are as old as the existence of man.

The authors of this work agree with Campillo (2018), considering that the development of physical capacities will contribute to the motor enrichment and the harmonious development of the student through the previous work of the Physical Condition. This work seeks to modify sedentary life habits that encourage attitudes that lead our students to full development of all their abilities (cognitive, motor, affective and social), inside and outside the school environment.

For Pérez Porto and María Merino (2021), coordination capacities are linked to the orderly arrangement of actions to meet an objective and orientation is part of this type. This can be defined as the ability of a person to be able to determine the position as well as the movements of their body, both in time and in space.

According to Figueroa (2016), cited by Cárdenas, M.; Burbano, V. & Valdivieso, M. (2019), coordination abilities correspond to a sequence of activities that are carried out directly or indirectly from an early age. These capacities are aimed at providing the individual with a large number of opportunities to interact effectively and pertinently with both the physical and human environment; their purpose is to stimulate the general development of the person or that of some of their specific areas.

According to Montenegro, cited by Vargas Alzate and Agudelo Velásquez (2015), coordination capacities are the *capacities related to the processes of conduction and movement regulation;* in other words, they are the capacities subject to the perception, analysis, execution and control of movement; they are executed through constant feedback, whose functional mechanism is the central nervous system (CNS).

From the initial phase (six to eight years) of the development of the nervous system and neurosensory factors of coordination, this is considered the propitious moment for the improvement of coordination capacities through new movement experiences. This age is recognized as the appropriate one for an evaluation and beginning with the processes of stimulation of the coordinative capacities according to Quitério, *et al.* (2017).

Spatial orientation helps to locate everything around us and individuals; it allows to go from one place to another without problems and to carry out different activities made up of numerous synchronized movements. They are knowledge and skills that we acquire from a very young age during the development of spatial orientation capabilities.

Spatiality is one of the motor perceptual capacities that, according to the curricular guidelines of Physical Education, must be worked on in the primary stages of children's school education, stated by Peñuela Ladino, CA (2020). Orientation capacity is the one to determine and change the position and movement of the body in space and time. This capacity is essential for the exploration and discovery of the world around a person**.** Children learn who they are through this exploration and adults learn about and engage with the context in which they live.

The importance of acquiring this specialty can be seen in the school environment where the learning of orientation and spatial representation is defined as a capacity that allows one to describe oneself in relation to an object located in space. This learning trains based on making movements in the different axes, left-right, front-back, or up-down.

In the article *Physical Education and its contribution to the comprehensive development of motor skills Bernate, J.* (2021), Backes, Porta & de Anglat are cited who point out that motor skills should be a fundamental part of human development. This develops in the early stages of life due to the ability to produce muscle movements in a coordinated and voluntary manner in children. This is how bases are established to acquire the development and cognition of language in the child; it also allows spontaneity and creativity in its stages of development, in addition to optimizing social skills.

Motor development is a genetically determined process influenced by psycho-biological maturation processes, body growth and motor learning; such development is observable through visible functional changes in some motor behavior patterns (Guillamón, Cantó and López, 2018); therefore, based on motor development, the state of children's coordination capacities can be explored.

Nakayama, L. (2018) addresses in his research that historically the game has had an undeniable presence in Physical Education, so different forms and objectives are assumed over time. The game as an activity, a means of learning other content, enabling the development of skills and abilities, has characterized Physical Education planning and classes for a long time. For some time now, the game has been revalued as a cultural knowledge with sufficient significance and importance to be considered a content with its own value in Physical Education.

UNIVERSIDAD DE PINAR DEL RÍO HERMANOS SAÍZ MONTES DE OCA
PODIUM
REVISTA DE CIENCIA Y TECNOLOGÍA EN LA CULTURA FÍSICA

It is characteristic of children of this age to constantly play games, an element that influences their physical and mental development. This age is subject to the particularities of the living conditions and demands that are placed on the child at each stage through which he passes. When characterizing the child of this age, elements such as:

- Keep your arms by your side.
- Stand with your feet together.
- Being able to perform some complex exercises.
- Walk straight.
- Constantly increase movements (running, jumping, throwing).
- The curvatures of the spinal column have been formed, among others

Physical Education within the educational system is a very important link for social development since it improves the quality of life and the physical abilities of the individual, all this leads to the integration of a word, health.

Through Physical Education, knowledge related to the environment is acquired and applied, which serves as a vital space for their motor experiences, stimulates their self-esteem, creativity, self-confidence and personal autonomy. This is done through their participation in motor activities of a playful, rhythmic nature, of exploration and conservation of the surrounding environment; develops motor skills and abilities through perceptual motor, playful and rhythmic activities. These contribute to their comprehensive training, their body development, the improvement of their health and the subsequent acquisition of motor skills; all of the above is part of the well-being offered to men by Physical Education in Cuba, without distinction of race, sex or religion. All with the same right that contributes to the comprehensive education of Cuban citizens.

It can be argued that the Physical Education class is the essential factor, the fundamental organizational form within the system of teaching and extra-teaching activities of a physical-sports nature with which it is linked. This is part of the reality of human existence, because movement is recognized, the fundamental connecting thread of the person with society and with the environment in which he/she develops. Movement is a constant in the life of man, so much so that without it his life would be impossible.

It is precisely this discipline that is responsible for dealing with human movements. Physical Education is not an end, but it adopts a very deep meaning as a member of Socialist Education. This manifestation is an invisible part of education since it contemplates both the physical and mental health of man and his multilateral development in the aspects of intellectual, physical, aesthetic, polytechnic and ideological education. This area weighs aptitudes and movement habits, along with an optimal development of their physical, moral and other qualities, which together define a large part of their physical capacity.

The Physical Education program in the first grade is characterized by giving continuity to the motor actions treated in the sixth year of life and the incorporation of new tasks aimed at improving physical performance capacities and the development of motor skills. This program includes basic gymnastics units, games and rhythmic activities that are

fundamentally aimed at the development of physical abilities: strength, speed, resistance, balance, coordination. Also included are: spatial orientation, rhythm and flexibility; basic motor skills are trained: running, jumping, throwing, catching, pulling, pushing, carrying, climbing and other skills such as driving and hitting.

In general, the Physical Education teacher tries in the class to comply with the planning of the contents and, despite paying attention to individual differences, this means that in most cases, in general, look for the execution of the exercise presented by the boy or girl, but rarely within the class. In addition, activities created with the implementation of other means to improve and motivate the learning of the task can be observed.

The Physical Education program for this grade presents guidelines for the treatment of coordination capacities. However, exercises and games are not enough for the development of this capacity that allows the improvement of the coordination of movements and orientation in space.

The observations made to classes reveal that children in the first grade have difficulties in spatial orientation, so it is intended through this research to elaborate a set of the research games to favor the treatment of spatial orientation in children in the first grade of primary school " *Antonio Briones Montoto.*

MATERIALS AND METHODS

The research was carried out in *Antonio Briones Montoto*" Primary School in the Bayamo municipality. As a reference in the process, 24 students were taken as a sample, 15 are female and nine are male. In these groups, it can be determined that none have diseases that make it impossible for them to practice physical exercises. The school has two Physical Education teachers to teach the subject in the first cycle. When analyzing the social origin, it is observed that 64% of the sample comes from dysfunctional families.

For the valuation of the proposed games, a total of 8 teachers were consulted, four of them with great knowledge in Physical Education in the initial stage, who issued their opinions and criteria on the subject; these, in turn, will act as responsible for the application to obtain greater results.

To fulfill the declared research tasks, it was necessary to use some methods:

Theoretical:

Analytical-synthetic: this method is used to collect information about the most current concepts on Physical Education, coordination capacities and games. This route is followed, both in the literature review and in the interpretation of the empirical data obtained at different times of the research.

Hypothetical-deductive, this method allowed to establish generalizations from the particular criteria, assess the general characteristics of the object of investigation and the pertinent conclusions.

Documentary review: this includes the review of documents related to the sample under study that allows obtaining data for characterization. For this, the programs and methodological orientations are taken into account.

Empirical:

Observation: this allows to know the manifestation of the subjects in the teaching process, to appreciate the treatment given by the teachers to the coordination capacities in the classes, specifically the spatial orientation. In addition, through this, the influence of the incorporation of games can be assessed to favor the improvement of this capacity in Physical Education classes for the 1st. degree in the teaching-educational process. This allows primary information to be obtained by exploiting the channel of visual information.

Experiment: a *pretest is carried out* to check the level of development of spatial orientation, with the execution of an exercise.

Test to evaluate spatial orientation: it allowed knowing the current state of the subjects studied in this reference and their subsequent evolution during the course of the investigation.

To analyze the level of development of spatial orientation, an exercise is applied in which the following evaluation scale is used:

From a standing position, at the teacher's command, run forward and change direction: to the right, to the left, backwards, at a distance of 8m.

Evaluation Time in seconds

- Good from 4-5.
- Regular 5-6.
- Bad more than 6.

Technique:

Survey: applied to Physical Education teachers to know the criteria they have of the content to work on the spatial orientation in the Program.

Statistical procedure: percentage calculation is used.

RESULTS AND DISCUSSION

Results of the documentary review

The revision of the Program showed that, despite specifying the characteristics of the subject, general objectives, contents by periods with their description, the Methodological Guidelines do not provide a due treatment to the contents. These offer suggestions for exercises and games that contribute to meeting the objectives of the different units. In the basic gymnastics' unit, the exercises are oriented in a general way for the treatment of spatial orientation, it constitutes a fundamental capacity for these ages, the exercises are not enough. These lack games for this special coordination capacity for the proper development of Physical Education classes; This is worked through exercises to address the motor problems that children present.

UNIVERSIDAD DE PINAR DEL RÍO HERMANOS SAÍZ MONTES DE OCA
PODIUM
REVISTA DE CIENCIA Y TECNOLOGÍA EN LA CULTURA FÍSICA

Observation result

Five classes were observed; in them, the teacher carried out exercises aimed at developing spatial orientation, an objective that is planned in classes since children have difficulties with this ability. The activities planned for the students were well executed and showed good performance in the development of these.

The teacher demonstrated extensive mastery and good preparation when teaching his class. Regarding the content of spatial orientation, the explanations and demonstrations were clear, they showed respect to their students, so there was a climate of trust and mutual respect. During the class, a regular use of teaching aids was observed. Organizational procedures were very well developed, although creative methods were not employed. Throughout the class, the teacher's motivation was good, but not that of the students who were not interested in the activity. No attention was paid to individual differences and the location of the students in the area, nor the conditions of the area, nor the number of students were not taken into account.

Survey result

The teachers consider that the program does not have a diversity of games and exercises to work on spatial orientation with the children. They agree that within the objectives of the program for this degree is the treatment of spatial orientation. However, the exercises they contain are very poor and there are no games to make use of this capacity in the classes and achieve its proper development; They also conclude that these programs do not sufficiently cover the content to be taught, since they are not well explained.

Teachers state that curricular adjustments are not made in their classes because to adapt the contents they must first consult the teaching specialists. They also consider that students have greater difficulties in this capacity. The methods that are mostly used in the classes are: method of joint elaboration and games, among others, the means to work are rustic and elaborated by the teachers such as: flags, balls, obstacles, cones, fences, they are not of the quality required in addition to being insufficient (Table 1).

Motor test results

Table 1. - Motor skills test

Total		Evaluated from Good		Evaluated from Regular		Evaluated from Wrong	
M	F	M	F	M	F	M	F
9	15	2	3	3	5	4	7
24		5		8		11	

The table shows that, out of 24 students, five students were evaluated as Good, representing 20.8 %. In this exercise, the children reached the finish line between 4 and 5 seconds, in addition to running the race with change of direction correctly, eight students representing 33.3 % are evaluated as Regular. They executed the exercise between 5 and 6 seconds with some difficulty, and evaluated 11 students as Bad. These

represent 45.8 % since these students completed the race in more than 6 seconds, in addition to mistaking the direction where the activity was heading. In general, it is observed that students have difficulties in spatial orientation since 79 % of them are in the Regular and Bad categories.

According to the analysis carried out, a game proposal is suggested that will enable teachers, through the Physical Education class in this teaching, to favor the coordinative capacity Spatial Orientation taking as a reference for the execution of the same the methodological steps given by Professor Watson, those that offer diversity of movements, influencing these, in addition, in the physical development of the child.

Game #1

Name of the game: The clock.

Materials: A rope.

Organization: Teams of 7 or 8 students are formed in a circle, one stays in the center with a rope.

Development: The one in the center has to turn clockwise, while passing the rope along the ground. Those who are in the circle must jump so that the rope does not touch them.

Rules: If the rope "touches them" it changes roles: it passes to the center of the circle.

The student in the center must always turn clockwise.

The team with the fewest children touched wins.

Variant: Jump rope all at once, those who lose go out until the winner remains.

Game #2

Game Name: The Four Corners.

Materials: Cones.

Organization: Four corners are used, in each one a cone is placed so that each team will be located in a circle around the cone. One child stays in the center of the area.

Development: At the teacher's voice, everyone has to change corners, the one in the center has to run towards one of them.

Rules: The student who stays out of one of the corners goes to occupy the center.

Variant: Make five teams and one stay in the center and at the teacher's command, each team moves together trying to occupy a corner.

he team that is left out loses and goes to the center. If the team is broken, they also lose so they must move together.

Game #3

Game Name: Rainbow:

Materials: 20 balls of different colors

Organization: Distributed throughout the space and walking freely individually. Balls are placed throughout the area.

Development: When the teacher says a color, the students must go as fast as possible towards the ball with the indicated color.

Rules: Students must not run. The student who gets the wrong color will have to answer a question that the teacher will ask.

Variant: Instead of balls, cones, hoops or other material can be used.

Game #4

Game Name: Near and far

Materials: Balls.

Organization: The group is divided into pairs; each pair carries a ball. Players move around the area by walking. Half of them carry a ball in their hands.

Development: When the teacher says "close!", the players must look for the closest teammate with their eyes and pass the ball to them. When he says "away!", the children who have the ball must look for a partner who is far away and pass the ball.

Rules: Students must move all the time and cannot keep the ball in their hands, after the teacher's order.

Variant: They can also be organized by teams.

Game #5

Name of the game: Change of pairs.

Materials: Whistle.

Organization: The group is divided into pairs. Running all over space.

Development: When running through the space, the signal to blow the whistle will be made and we must change partners; at the next signal we try to recover our original pair.

Rules: In the second change of partner, you cannot choose another one that is not the original.

Variant: Each time the whistle blows, choose a different partner.

Game #6

Game name: The world upside down.

Materials: Various objects in the area such as: goals, cones, etc.

Organization: The students will be scattered in the area where there will be many different objects of various colors.

Development: The teacher will indicate an action and the children must do the opposite, example:

- In the reverse world, everyone stands outside the goals (everyone must get inside).
- In the upside-down world, everyone runs forward (everyone runs backwards).
- In the upside-down world everyone touches the color white (everyone is going to touch something black).

Rules: The child who performs the action backwards loses.

Variant: Do what the teacher says instead of doing the opposite.

To obtain good results in the development of games, the teacher must take into account the following aspects:

- Develop necessary teaching aids.
- Condition the land, taking into account its particularities.
- Form the teams taking into account the level of development of the students, trying to prioritize homogeneity.
- Teach the games in increasing order of difficulty.
- Address individual differences.
- Get students to actively participate without losing time in the activity.

The teacher must have a clear image of the game that he will teach his students. The structure of the same, the motives and interests of the participants, the circumstances in which he is forced to participate, requires that the teacher use the methodological steps for teaching the games and, with this, will guarantee mastery on the part of the students of the content of the game and their active participation in these. Next, reference is made to the methodological steps:

- Enunciation of the name of the game.
- Motivation and explanation of the game.
- Organization and training.
- Game demo.
- Game practice. Application of the rules.

- Development and variants. The variant is applied to a game when it is already known by the students.
- Evaluation.

Methodological indications to be taken into account when applying the games

1. Start with the simplest games and then increase their complexity.
2. Use the method of games, in addition to problem solving that encourages motivation and interest in students.
3. Develop educational habits and compliance with the rules.
4. Variants should be used in the games with initiatives of the students and incorporate them in the analysis of the same.

This research that deals with the treatment of games in Physical Education has had an impact on the development of the teaching-learning process in this subject and its results have been compared with other studies related to didactic games in this branch, but for others purposes: Didactic Games in primary education from traditional games (Rueda, *et al.,* 2015); Didactic games to contribute to ludomotricity and motor skills (Hernández, *et al.,* 2022); introduction of video, games in Physical Education (Arufe-Giráldez, 2019), educational games in nature, among other topics (Viñes, Ramírez, 2020).

CONCLUSIONS

The theoretical and methodological foundations analyzed allowed to determine and adapt the games to favor the development of spatial orientation in the Physical Education class.

The initial diagnosis showed that children have little development of spatial orientation. The games selected for the work of spatial orientation in Physical Education classes will favor the development of this capacity in first grade children.

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Conflict of interests:

The authors declare not to have any interest conflicts.

Authors' contribution:

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