

# Extracurricular sports and recreation activities as a component of the cognitive activity development of primary school children

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**Abstract.** Analysis of scientific and methodological sources on the main positions of development and improvement of physical culture in general education institutions shows that it is necessary to pay attention to the development of schoolchildren cognitive abilities through project activities, interactive game technologies, and personal participation in sports events. Extracurricular activities are an expanded space of upbringing and education, it creates additional opportunities for self-realization and self-knowledge, their capabilities through sports and recreation activities. This article describes the methodology of sports and recreation classes held outside of school hours with the introduction of game sports (basketball, floorball), interactive technologies. The content of the proposed methodology is traditional. It consists of mastering knowledge methods, improving motor skills and developing physical qualities. They are formed thanks to the proposed interactive game technologies and tasks for the intellectual abilities development. The article discusses the possible conditions of sports and recreation activities in general education institutions that ensure a more successful development of younger students cognitive activity. Analysis and generalization of scientific and methodological literature, testing, questionnaires, pedagogical experiment, methods of mathematical statistics. The experimental method was implemented in junior classes and was conducted as part of extracurricular sports and recreation activities in accordance with the Federal state educational standard. The proposed forms and methods of organizing basketball and floorball classes with the inclusion of interactive game technologies and tasks for the development of intellectual abilities increased the cognitive activity of younger schoolchildren. The results of the pedagogical experiment showed the expediency and effectiveness of the proposed method. It provides a holistic approach in the framework of extracurricular sports and recreation activities to improve the indicators of younger schoolchildren cognitive abilities.

## 1 Introduction

Modern living conditions impose increasingly high demands on the development of a child's personality. We analyzed psychological and pedagogical research of specialists G. S. Petrov, 2017; A. N. Guseva, E. R. Kochieva, 2016. Children who take an active motor position and become active participants and leaders in the process of any proposed motor activity improve their mental and practical activities, solving specific and problematic tasks.

With the introduction of new sports, extracurricular activities increase motivation for physical education, self-improvement and new knowledge in the field of sports. In this regard, the problem of finding and developing effective methods of extracurricular activities that combine various forms of classes with the introduction of interactive technologies becomes urgent.

We introduced a method of sports and recreation classes. It included classes in sports games (basketball, floorball), interactive tasks (cards, tables, etc.) for the development of memory, thinking and perception. This made it possible to expand the scope of technical, tactical and physical training of younger students, to influence the development of physical qualities and intellectual development. There is a need to analyze the cognitive activity of younger students who are engaged in extracurricular activities in the section on game sports.

The purpose of this work is to study the impact of extracurricular sports and recreation activities on the cognitive abilities development of younger schoolchildren.

## 2 Materials and methods

Currently, one of the main reasons for the sharp decline in the health of primary school children is insufficient motor activity.

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Violation of the development principles and brain functional systems formation is reduced to the fact that primary school children are overloaded with educational activities. It contradicts the essence of school childhood, that is, active creativity, play activities, physical activity. But we forget that the basis for the formation of brain functions is precisely these types of activities that allow us to be productively implemented in educational activities in the future. The lack of motor activity can have a disappointing effect on the overall development of the child, his mental and physical performance.

Many experts (N. I. Dvorkina, 2008; V. A. Balandin, 1999; L. G. Panenko, 2000; V. A. Pegov, 1999, etc.) suppose that there is a close relationship between the indicators of physical and mental qualities of younger schoolchildren. "Physical qualities" are considered as morpho-functional qualities that develop in the process of physical education. Human motor activity is possible due to physical qualities such as strength, speed, endurance, flexibility. In their works, the authors talk about the positive impact of active motor activity on mental performance when studying game sports in physical education classes, especially when mastering the rules of the game and tactical elements. The authors [2,8,9] claim that tactical thinking passes the stage of formation as a result of the conjugation of training in technical and tactical actions in order to correctly and accurately simulate tactical combination tasks during training and direct the young athlete to make the right decision to "exit" from the proposed game combination.

The universal impact of physical exercise on the child's body is determined by the unity of biological, intellectual, physical and social development. It determines the appropriate means and methods. The experimental method of extracurricular activities with primary schoolchildren allows to realize the developing potential of intellectual training in the process of mastering the technical and tactical elements of sports games and interactive tasks. This contributes to creating a close relationship between cognitive abilities and physical development of younger schoolchildren.

### 3 Results and discussion

To test the effectiveness of the experimental method, a comparative analysis of the children's cognitive activity development in educational institutions of the city of Ulyanovsk was conducted. The methods and forms of organizing and conducting sports and recreation classes, sports and mass events provide for additional motor activity of younger school children, sports games with the use of interactive tasks to increase children's cognitive abilities.

The research involved children of primary school age 9-10 years (122 people) of School No.15, School No.4., Ulyanovsk. A control group (CG) of 60 pupils and an experimental group (EG) of 62 pupils were formed. The organization of extracurricular activities with pupils in the control group was carried out in accordance with the Federal state educational standard, while students in the experimental group were engaged in the proposed method.

Before the pedagogical experiment, an initial test of cognitive activity of younger schoolchildren was conducted. The following indicators were evaluated in the test: perception, attention and memory.

The test showed the following results. The speed of finding signs for 9-year-old pupils in CG was 21.9 s, and for experimental group pupils it was 19.7 s (table 1). In six tasks the CG pupils and EG pupils had significant differences. Most of the studied indicators differed at the five percent significance level. The annual increase in the performance of tasks for perception in CG was 9.5 % ( $p < 0.05$ ), EG – 12.1 % ( $p < 0.05$ ).

**Table 1.** Time to complete the task on the perception of CG and EG pupils, s

№	Test tasks	CG		EG	
		Age			
		9	10	9	10
1.	«Plus» (+)	21,4	19,5	19,0	17,6
2.	«Minus» (-)	21,7	20,5	20,2	18,3
3.	Vertical line ( )	22,8	20,9	20,7	19,6
4.	Point (●)	21,5	20,6	20,2	18,0
5.	Division sign (:)	18,3	18,0	17,4	16,2
6.	«Equal» (=)	22,4	20,3	19,2	17,5
7.	Multiplication (×)	22,4	20,1	19,7	17,3
8.	Slant line (/)	24,3	21,8	20,9	19,1
9.	Average index	21,9	20,2	19,7	18,0

Note. The quantitative index of boys and girls who took part in the pedagogical experiment was approximately equal.

EG pupils 10 years old completed the perception task 12.2 % faster than pupils of KG. The advantage in performing this task by pupils of the experimental group was in seven of the 8 possible indicators. However, improvement in results was observed in both groups (CG-7.8 %,  $p < 0.05$ ; EG-9.4 %,  $p < 0.05$ ). The results show that the younger EG pupils completed perception tasks much faster than the pupils of the CG. The fact suggests that the proposed technical combinations with the ball in basketball and floorball in the EG improved perception – "feeling the ball".

When studying the accuracy of perception (table. 2) of 9 year-old pupils of CG, the accuracy of the task was 85.5%, in EG-94.9%. They completed tasks not only faster, but also more accurately. EG pupils accurately found 75.9 tasks (94.9%), CG – 68.4 tasks (85.5%). This pattern can also be traced in 10-year-old pupils: in the EG, only individual tasks made mistakes and the indicator was 99.6 %, in the CG, the indicator was lower.

**Table 2.** The accuracy rate of perception by pupils from the CG and the EG

Test tasks	CG		EG	
	Age			
	9	10	9	10
1	10,1	11,5	11,7	12,0
	74,2	95,8	97,5	100,0
2	9,9	10,9	11,3	12,0
	82,5	90,8	94,2	100,0
3	7,7	8,3	8,8	9,0
	85,6	92,2	97,8	100,0
4	8,9	10,1	10,9	11,9
	74,2	84,2	90,8	98,3
5	7,3	7,5	7,4	8,0
	91,3	93,8	92,5	100,0
6	8,3	8,5	8,7	9,0
	92,2	94,4	96,7	100,0
7	8,2	8,4	8,6	9,0
	91,1	93,3	95,6	100,0
8	8,0	8,5	8,5	8,9
	88,9	94,4	94,4	98,9
Average index	68,4	73,7	75,9	79,7
	85,5	92,1	94,9	99,6

Note. Absolute values are represented in the numerator, and relative values are represented in the denominator.

Thus, EG pupils performed tasks more accurately and faster, since the proposed method included the assimilation of various types of exercises for technique and tactics in the development of basketball and floorball. The method also included tasks that contribute to improving the level of development of motor and coordination qualities, among which one of the leading places belongs to the accuracy of movements.

The next study indicator of the primary school children cognitive activity was auditory memory. In organizing physical education classes with children, it is the speech factor that plays an important role in contact with the teacher.

The obtained results of auditory memory indicators show a certain advantage of the EG students over their CG peers at a one-percent significance level (table 3).

**Table 3.** Comparative characteristics of memory indicators in CG and EG schoolchildren, points.

Groups	AGE	
	9	10
	Statistical indicators ( $\bar{x} \pm m$ )	
CG	3,82±0,12	4,05±0,14
EG	4,33±0,14	4,62±0,11
	Intergroup confidence of differences	
	<0,01	<0,01

Next observations of 10-year-old pupils in both groups suggest that auditory memory indicators improve in both CG and EG. However, the received changes are unreliable.

Intergroup differences in auditory memory indicators of 10-year-old pupils were 14.1 % ( $p < 0.01$ ): the advantage of pupils in the experimental group can be traced. During the period of the pedagogical experiment, EG pupils reached a higher level of auditory memory development ( $\bar{x} = 4.62$  points) compared to the pupils of the CG.

The study of the attention state in young pupils allowed us to give the following characteristics. A significant increase in attention indicators was found in 9-year-old primary school children, in the control group this indicator was 14.7 % ( $p < 0.001$ ), in the experimental group – 14.6% ( $p < 0.001$ ). Significant inter-group differences in indicators at this age are observed at a five-percent significance level (table 4).

**Table 4.** The attention indicators of CG and EG pupils, points.

Groups	AGE	
	9	10
	Statistical indicators ( $\bar{x} \pm m$ )	
CG	6,80±0,15	7,24±0,20

EG	7,28±0,13	8,08±0,19
Intergroup confidence in differences		

The results of the test task for attention with pupils of 10 years in the CG and the EG also indicate positive results. The CG schoolchildren indicator increased by of 6.5 % ( $p>0.05$ ) and reached 7.24 points, while the EG pupils improved this indicator (11.0%,  $p<0.01$ ) and amounted to 8.08 points.

## 4 Conclusions

Thus, the results of the pedagogical experiment allowed to confirm the possibility of a comprehensive solution of educational and health problems by means and methods of physical culture and sports. This is confirmed by positive results, both in the control and experimental groups. The proposed experimental method in the framework of extracurricular sports and recreation activities allowed us to provide a holistic approach to the development of pupils intellectual abilities, aimed at activating mental activity, improving attention, memory, and perception. The acquired skills in sports games (basketball, floorball), as well as a conscious attitude to physical exercises contribute to the self-development and self-improvement of children.

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