

## PHYSICAL EDUCATION OF UKRAINIAN SCHOOLCHILDREN DURING DISTANCE LEARNING

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**Abstract.** *The article addresses the challenges associated with fostering the physical development of Ukrainian schoolchildren connected with distance learning in physical education. The primary conditions for adopting distance learning stemmed from the Covid-19 pandemic and now confronts military aggression from Russia. The goal: to track the progress of 7th-grade students' physical development through remote physical education learning programme. Research methods: theoretical analysis, literature review, pupil questionnaire, pedagogical experiments, and statistical analysis. Surveying 126 7th-grade pupils (60 boys and 66 girls) revealed a prevailing preference for traditional face-to-face physical education classes. Only 11.11% of pupils considered distance learning to replicate a well-structured physical education session. Results showed that 84.12% believed remote lessons influenced their motor activity, physical fitness, and interest in exercises, 57.15% reported decreased personal motor activity, 42.85% felt their physical fitness remained unchanged. The methods employed by teachers during distance learning included fitness programmes (58.73%), general developmental exercises (42.86%), and strength exercises (36.51%). Approximately 22.22% of pupils indicated a tendency to disengage from distance lessons. The authors' remote physical education learning programme proved effective fitness indicators among the experimental group (EG) pupils compared to the control group (CG). Statistically significant differences were established across multiple physical fitness indicators for 7th-grade EG schoolchildren.*

**Keywords:** *distance learning, physical education, 7<sup>th</sup> grade schoolchildren.*

## **Introduction**

For the last four years physical education in Ukrainian schools has been in rather difficult circumstances. At first, the prerequisite was the Covid-19 pandemic (introduction of strict and adaptive quarantine), and now this is the unprovoked full-scale invasion of Ukraine by Russia, which prompted Ministry of Health of Ukraine and Ministry of Education and Science of Ukraine to switch to distance learning. The problem of conducting physical education lessons for sports that require special equipment and inventory, as well as team interaction, has arisen, which negatively affects not only the dynamics of the development of physical qualities, but also technical and tactical training of schoolchildren in each sport. Teachers and students have faced a number of difficulties with the preparation of video materials, the impossibility of conducting online physical education lessons in home setting, the impossibility of mastering technical training exercises in many sports that are included in the curriculum, low level of proficiency and provision of modern information and communication technologies both among physical education teachers and students.

## **Literature review**

A significant number of Ukrainian scientists have devoted their articles to the issue of selection of means for remote physical education lessons. Scientists emphasize the difficulties of physical education during the period of quarantine and distance learning (Kryviencova, Klimenchenko, & Ivanov, 2020; Bashtenko & Stanieva, 2021; Ilnitska, Semashko, & Kryviencova, 2021; Sapiiegina, 2022); peculiarities of physical education of schoolchildren and the necessity to select innovative forms for distance learning period (Poproshaiev, Muntjan, & Goienko, 2020; Cherepovska, 2021; Cybulko & Globa, 2021; Mozoliev, 2022), as well as the study of pupils' motivation to engage in physical exercises (Kukhar, Sorokolit, Yavorsky, Rymar, & Khanikiants, 2021); the effect of distance learning on pupils' motor activity (Sirovatko & Yefremenko, 2022); issues regarding adaptation of pupils and parents to remote physical education lessons (Maslova et al., 2021), their interaction in the conditions of distance and mixed learning: two-years' experience of overcoming the negative impact of the COVID-19 pandemic (Malykhin, Aristova, & Kalinina, 2022); peculiarities of physical education of schoolchildren in the conditions of martial law (Lytvyn, 2022; Zabijako, 2023); the effect of distance learning on motor activity of schoolchildren in the conditions of martial law (Vashchuk, 2022); application of an integrated approach in modern school in the context of distance learning (Horbatiuk, Polishchuk, Kuchynska, & Blashkova, 2023).

In addition, research related to the introduction of reforms in Ukrainian school education has intensified in recent years (Moskalenko, Bodnar, Sorokolit, Rymar, & Solovey, 2020) as well as the formation of professional skills of a physical education teacher (Sorokolit, Lukjanchenko, Turchyk, & Chopyk, 2021); selection of effective means of physical education from various sports (Khanikiants, Konestyapin, Rymar, Yaroshyk, & Sorokolit, 2021; Rymar, Sorokolit, Solovey, Yaroshyk, & Khanikiants, 2021); improving physical education of middle school age pupils (Sorokolit, Shyyan, Lukjanchenko, & Turchyk, 2017).

The problems of remote physical education are also highlighted by foreign scientists. Some search for effective means of distance online learning (Nining et al., 2021); others study motor activity and sense of security among schoolchildren during the Covid-19 quarantine period (Piestrzyński et al., 2021); some look for the ways to improve online learning with smart devices in the post-pandemic period (Bingbing & Margeviča-Grinberga, 2022).

However, the issue of the impact of distance learning on the quality of physical education lessons in schools, physical fitness of schoolchildren remains unexplored, which formulate the purpose of this research.

The purpose of the research is to monitor the development of physical qualities of 7th grade schoolchildren under the influence of the authorial remote physical education learning programme.

## **Methodology**

Theoretical analysis, generalization of relevant literature sources, as well as sociological method (questionnaire of schoolchildren), educational experiment and mathematical statistics methods were applied in this research. Literature analysis enabled to identify the peculiarities of the physical education of schoolchildren in Ukraine connected with the transition to distance learning mode. The questionnaire of 126 seventh-grade pupils (60 boys and 66 girls) revealed their attitude towards physical education in the conditions of distance learning, its influence on motor activity, their interest in physical exercises and the opportunity to develop physical qualities. The opinion of schoolchildren regarding the effectiveness of physical education tools and features of physical education lessons in remote mode are clarified; impact of distance learning on physical, technical and tactical preparedness is revealed.

The results of the abovementioned theoretical analysis and questionnaire formed the basis of the development of the authorial remote physical education learning programme. An experimental verification of its influence on the dynamics of the physical quality's development was carried out by conducting a pedagogical experiment. The participants of the experiment were schoolchildren of 7th grade, namely 63 pupils (the experimental group (EG) consisted of 33

pupils (16 boys and 17 girls) and the control group (CG) consisted of 30 pupils (15 boys and 15 girls). The toolkit for testing the influence of this programme on the development of speed capabilities was a 30 m run exercise; long jump from a standing position was applied for measuring speed and strength; leaning forward from a sitting position for testing flexibility and bending and extending the arms in a prone position or on the knees (full push-ups; knee push-ups for girls) for testing strength were applied respectively.

The results of the experiment were processed by means of mathematical statistics methods, which provide quantitative and qualitative analysis of the obtained data. When comparing average values in and between the groups, Student's t-test coefficient was used to determine the reliability of the data under study.

### **Research results**

The results of the questionnaire have shown that schoolchildren would prefer in-person physical education lessons. Only 11.11% of pupils stated that online lessons have all the features of a well-organized in-person one. Among those surveyed, 84.12% agreed that the remote form of conducting a physical education lesson affects motor activity, physical fitness and interest in physical exercises. However, 57.15% pointed out a decrease in motor activity during online lessons. Despite this 61.9% believed that the indicators of the development of physical qualities during distance learning remained unchanged since teachers mostly used exercises that had positive effect on physical fitness, namely from aerobics (58.73%); general developmental exercises (42.86%); strength exercises (36.51%). As for schoolchildren's desire to keep remote mode of physical education lessons, 22.22% of the surveyed students answered positively. The percentage of those was higher among girls than boys.

The results of the questionnaire became a prerequisite for developing the authorial remote physical education learning programme, which contains a complex of designed electronic educational and methodical materials for each kind of sport. Synchronous and asynchronous teaching format is used.

Synchronous format meant conducting a lesson according to the schedule by using ZOOM conference facilities and individual consultations with the pupils.

In asynchronous format the pupils received theoretical and practical tasks every week. Those were sets of physical exercises (developed by the authors of the article), videos from YouTube and Tik-Tok.

For control and quality feedback pupils provided media files (photos or videos), PowerPoint presentations, video reports, answers to test tasks. E-mail, Skype, Viber, Telegram, WhatsApp applications were used to check individual

tasks, as well as to establish effective communication. Pupils received points for completing the tasks according to a 12-point rating system.

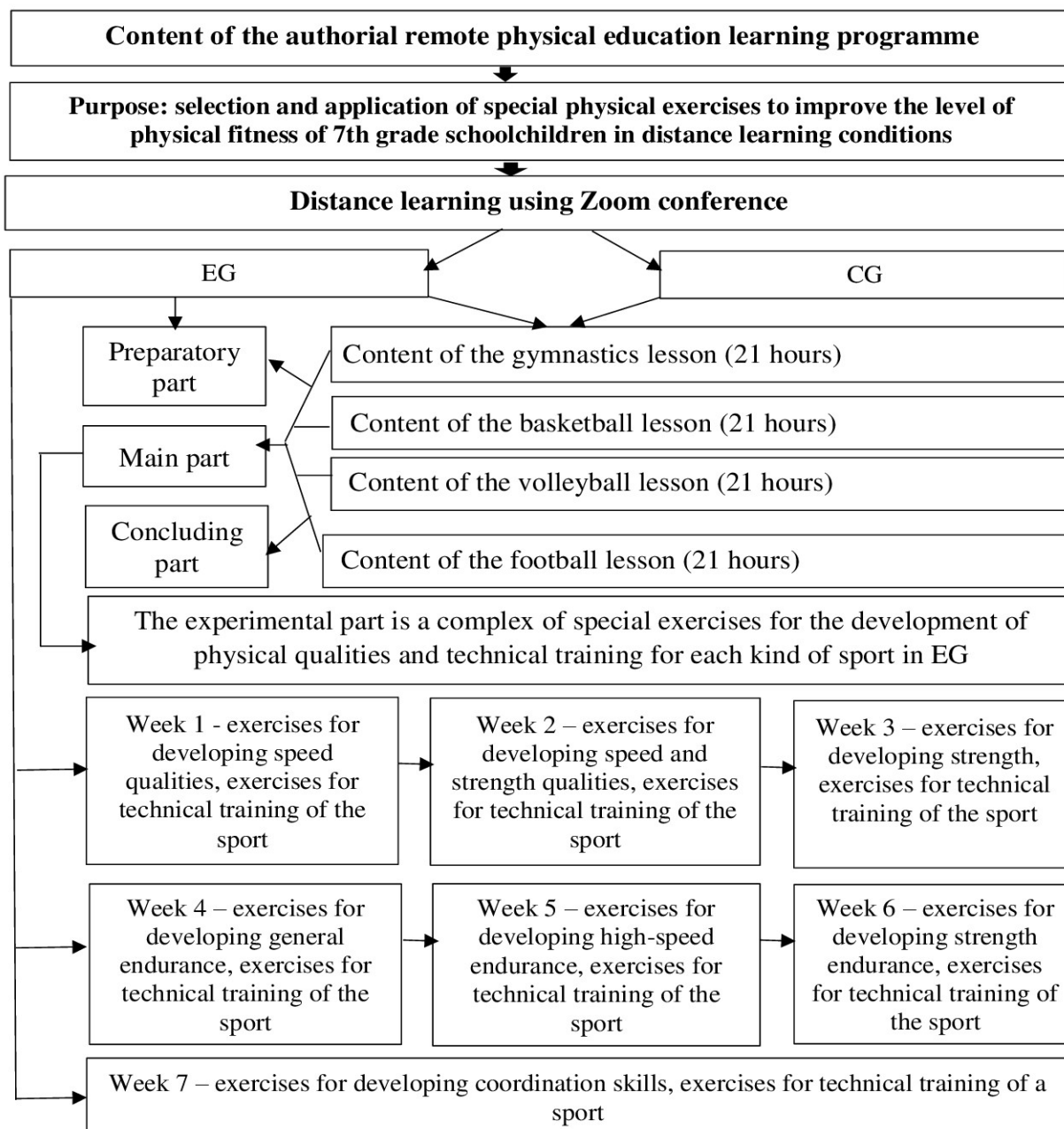


Figure 1 The scheme of the designed authorial remote physical education learning programme (created by authors)

In addition, we used motivational videos for practice in limited space: authorial courses in learning gymnastics, volleyball, basketball, football; video lectures; electronic training manuals and publications on gymnastics, volleyball, basketball, football; literature for students on gymnastics, volleyball, basketball, football; lectures in Power Point format; theoretical tasks and testing (self-

control); video presentations and illustrative material. In case of missing classes pupils were offered to complete individual tasks.

The scheme reflecting the structure and content of the designed authorial remote physical education learning programme is shown in Fig. 1.

The pedagogical experiment has proved the effectiveness of the selected means during remote physical education lessons. In the EG significant and reliable changes in the indicators of physical fitness among boys and girls were observed (Table 1).

**Table 1 Change in the physical fitness indicators in the EG after implementing the means of the authorial remote physical education learning programme (created by authors)**

Test exercise	Gender	Before the experiment	After the experiment	p
30 m run, sec	Boys (n=16)	4,79±0,05	4,48±0,10	p<0,05
	Girls (n=17)	5,37±0,07	4,97±0,06	p<0,05
Long jump from a standing position, cm	Boys (n=16)	196,73±5,48	211,50±4,86	p<0,05
	Girls (n=17)	169,30±3,56	180,33±2,94	p<0,05
Leaning forward, cm	Boys (n=16)	5,53±0,75	9,73±1,06	p<0,05
	Girls (n=17)	9,67±0,76	16,67±0,96	p<0,05
Bending and extending the arms in a prone position / on knees (full push-ups/knee push-ups)	Boys (n=16)	26,20±1,32	38,20±2,44	p<0,05
	Girls (n=17)	15,43±0,84	21,97±1,48	p<0,05

As for the effectiveness of physical education in the CG a statistically significant increase in the indicators of speed qualities for boys, that of flexibility for girls and strength regardless of gender were observed (Table 2).

**Table 2 Changes in the indicators of physical fitness in the CG during distance learning period (created by authors)**

Test exercise	Gender	Before the experiment	After the experiment	p
30 m run, sec	Boys (n=15)	4,88±0,04	4,73±0,06	p<0,05
	Girls (n=15)	5,47±0,07	5,41±0,09	p>0,05
Long jump from a standing position, cm	Boys (n=15)	197,57±4,78	205±5,00	p>0,05
	Girls (n=15)	163,33±4,13	170,33±3,60	p>0,05
Leaning forward, cm	Boys (n=15)	5,93±1,07	7,00±0,95	p>0,05
	Girls (n=15)	11,00±1,26	13,93±1,14	p<0,05
Bending and extending the arms in a prone position / on knees (full push-ups/knee push-ups)	Boys (n=15)	23,67±0,83	27,70±1,04	p<0,05
	Girls (n=15)	14,00±0,84	16,53±0,97	p<0,05

Comparative analysis of the physical fitness indicators of the groups under study proved the effectiveness of the authorial remote physical education learning programme, since the selection of its tools enabled the indicators of physical fitness of the EG participants to improve statistically significant and to establish reliable differences between the majority of their indicators of physical fitness as compared to those of the CG participants (Table 3).

**Table 3 Comparison of the indicators of physical fitness of the EG and the CG schoolchildren before and after the experiment (created by authors)**

Comparison of indicators of speed qualities during the experiment between the EG and the CG (30 m run, sec)							
Gender	Group	Before	t	p	After	t	p
Boys	EG (n=16)	4,79±0,05	1,830	p>0,05	4,48±0,10	2,609	p<0,05
	CG (n=15)	4,88±0,04			4,73±0,06		
Girls	EG (n=17)	5,37±0,07	1,294	p>0,05	4,97±0,06	4,769	p<0,001
	CG (n=15)	5,47±0,07			5,41±0,09		
Indicators of the development of speed and strength qualities during the experiment between the EG and the CG (standing long jump, m)							
Boys	EG (n=16)	196,73±5,48	0,309	p>0,05	211,50±4,86	1,142	p>0,05
	CG (n=15)	197,57±4,78			205±5,00		
Girls	EG (n=17)	169,30±3,56	1,339	p>0,05	180,33±2,94	2,639	p<0,05
	CG (n=15)	163,33±4,13			170,33±3,60		
Indicators of flexibility development during the experiment between the EG and the CG (leaning forward from a sitting position, cm)							
Boys	EG (n=16)	5,53±0,75	0,376	p>0,05	9,73±1,06	2,349	p<0,05
	CG (n=15)	5,93±1,07			7,00±0,95		
Girls	EG (n=17)	9,67±0,76	1,114	p>0,05	16,67±0,96	2,241	p<0,05
	CG (n=15)	11,00±1,26			13,93±1,14		
Indicators of strength development during the experiment between the EG and the CG (full push-ups (boys); knee push-ups (girls); number of times)							
Boys	EG (n=16)	26,20±1,32	1,989	p>0,05	38,20±2,44	4,842	p<0,001
	CG (n=15)	23,67±0,83			27,70±1,04		
Girls	EG (n=17)	15,43±0,84	1,472	p>0,05	21,97±1,48	3,752	p<0,01
	CG (n=15)	14,00±0,84			16,53±0,97		

The conducted research indicates that pupils in Ukrainian schools generally favor in-person lessons over distance learning. Distance lessons have been observed to adversely affect technical training and hinder team interaction. Our findings align with previous research on challenges in organizing remote learning (Bashtenko et al., 2021; Ilnitska et al., 2021).

Nevertheless, it is noteworthy that during remote physical education classes, effective methods for developing physical qualities can be chosen. This observation is supported by the results of scientific research conducted under martial law conditions (Lytvyn, 2022).

## Conclusions

Thus, the results of the pedagogical experiment in the EG make it possible to conclude that the selection of physical education tools that are recommended for implementation in remote physical education are effective for the development of speed, speed and strength qualities, flexibility and strength. Girls had better performance gains in 30 m running exercise and leaning forward from a sitting position, while boys showed better performance during control of speed and strength, and strength qualities.

Conducting physical education lessons in the conditions of distance learning in the CG has enabled to statistically significantly improve the average performance of boys in 30 m run exercise, flexibility range among girls, and strength indicators regardless of gender. However, it is observed that in the CG little attention was paid to the development of speed qualities (for girls), speed and strength (for girls and boys), and flexibility (for boys), therefore no statistically significant changes are detected.

Summing up, the designed authorial remote physical education learning programme proved to be effective, as the selection of its means made it possible to statistically significantly improve the indicators of physical fitness of the EG pupils and to establish reliable differences between the majority of indicators of physical fitness of 7th grade schoolchildren in the EG as compared to those in the CG.

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