

# An Educational Technology of Using Physical Training and Sports to Prepare Children for School

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**Abstract**—The purpose of this study is to develop and demonstrate the merits of an educational technology that involves using physical training and sports as means for preparing children of different social groups to attend school. We have analyzed the metrics of school readiness among pre-school age children of three social groups: kindergarden children, children from group homes, and children attending a health and fitness club. Based on the analysis of their physical activity, we have developed the framework and content for an educational technology aimed at promoting the physical, psychological and intellectual readiness to attend school in children of different social groups. Additionally, the children's physical activity routine included active game classes as well as posture and coordination exercise. The effectiveness of the developed technology has been tested through an 8-month long educational experiment. After its conclusion, children of each social group have shown improved morphofunctional development, physical fitness, and social adjustment. The metrics of children's school readiness have changed as well: 78% of kindergarden children, 83% of health and fitness club children, and 56% of group home children have demonstrated readiness for primary school education programs.

**Keywords**—*pre-school age children, educational technology, physical training, sports*

## I. INTRODUCTION

One of the aspects of the present-day system of education and upbringing for pre-school age children is getting the kids ready to attend school. In terms of their way of living, pre-school age children can be divided into three social groups: those who live in a family and attend kindergarden, orphan children who live in group homes, and children who live in a family and do not attend kindergarden. The upbringing and education of kids in these groups have significant differences that play a role in children's socialization and readiness to attend school. In practice, some aspects of upbringing and education in various social groups can result in certain category of children being unprepared for systematic and focused school studies [1, 3, 5].

In contemporary educational and psychological literature, the children's readiness for school is defined as integration of morphofunctional, psychological and social aspects that can ensure successful transition of a child to a systematic, organized study routine at school [1, 2, 7, 9]. Pre-school age children adjust to school life differently due to several

reasons: different social status, pre-school childhood experience, health status, as well as physical and emotional-volitional development level. Appropriate inclusion of physical training and sports in daily activities can help pre-school children adapt to educational and upbringing process in primary school. Use of play-based coordination, flexibility and posture development exercises as part of regular activities during pre-school age allows for an appropriate transition from play to studies [2, 4, 5, 7, 8,10].

Peter Lesgaft, one of the founding fathers of physical education theory in Russia, emphasized that physical education should not be limited only to improving a person's health and fitness or sports skills, but should organically involve mental, ethical, labor and aesthetical development. Comprehensive personal growth is possible only through appropriate combination of various forms of schooling [6].

The purpose of this study is to develop and demonstrate the merits of an educational technology that involves using physical training and sports as means for preparing children of different social groups to attend school. We look at three social groups of pre-school age children: kindergarden children, children from group homes, and children attending a health and fitness club.

## II. MATERIALS AND METHODS

The study was conducted in pre-school educational institutions, children's health and fitness clubs in Moscow, and a children group home in Tula Oblast.

Our analysis was based on data obtained from pedagogical observation and an educational experiment during 2016-2018. The study involved 600 children of pre-school and primary school age.

The study methods used were: an analysis of literary sources and practical experience, pedagogical observation, the educational experiment, and mathematical statistics methods.

Pedagogical observation involved monitoring children over the course of the day. We took note of the time of their physical activities, including specially organized, play-based, and spontaneous activity. The time was measured in minutes. The obtained results allowed us to determine the amount of physical activity of pre-school age children.

The merits of the developed technology were tested during the educational experiment. At the start and the end of the experiment, we tested for metrics of morphofunctional development and physical fitness, certain psychological and physiological qualities, emotional attitudes, as well as children's socialization during play.

The children's morphofunctional development and physical fitness levels were determined through standard measurements (body weight/height, chest girth, hand strength) and through tests (3x10m shuttle run, standing long jump, squats within 30 seconds, bends).

Psychological and physiological qualities, as well as emotional attitudes, were determined using Lüscher color test.

Children's socialization during play was assessed via a diagnostics checklist.

School readiness was assessed through Kern-Irasek school maturity test and a graphical dictation test.

**III. RESULTS AND DISCUSSION**

The framework for our educational technology of preparing children for school is based on the principle that appropriate use of physical training and sports in pre-school kids' daily routine will benefit their physical, mental, and emotional-volitional development as well as their social adjustment, which will help children better adapt to school lifestyle.

During our pedagogical observation of 5 to 7-year-old children's daily physical activity, we recorded the time of their spontaneous physical activities, outdoor and play activities, as well as physical and morning exercise. The duration was measured in minutes.

Table 1 below shows average physical activity metrics for children of three different social groups.

TABLE I. 5 TO 7-YEAR-OLD CHILDREN'S DAILY PHYSICAL ACTIVITY ROUTINE (IN MINUTES)

#	<i>Pedagogical observation results</i>	<i>Children attending kindergarden (X ± σ)</i>	<i>Children living in group home (X ± σ)</i>	<i>Children attending health and fitness club (X ± σ)</i>
1.	Daily physical activity	170 ± 32	158 ± 37	138 ± 46

Pedagogical observation shows that among pre-school age children, those who attend kindergarden have more physical activity than other groups. The reason for this is that kindergarden training and upbringing program involves specially organized classes that provide for more physical activity with more varied content.

The content of our educational technology is based on the analysis of pedagogical observation. The children's physical activity routine was supplemented with additional play and physical exercise.

Children of each social group also had a correctional activity class. This class involved posture development, flat feet prevention, coordination and flexibility development exercises. Additionally, a story-based play class was conducted in a specially equipped room. This class mostly involved activity-based play. Each class was 25 minutes long and was conducted twice a week.

The effectiveness of the proposed educational technology was determined through comparison of physical fitness, morphofunctional development, and socialization level metrics before and after 8 months of additional classes.

The analysis of the results has shown that children who attend kindergarden and those who attend classes in health and fitness clubs, fall into the 'physically strong' group, while group home children fall into the 'physically lacking' group. In our comparison, we need to account for a large variation in metrics within each group (coefficient of variation V = 28% to 46%).

At the conclusion of the educational experiment, the metrics of each group improved, but the differences within the groups remained.

With regard to the psychological and emotional metrics, children from the group home show less favorable results compared to children who live in families.

Only 9.1% of group home children have adequate mental outlook, compared to 56% of kindergarden kids and 67% of health and fitness club kids. 41% of group home children experience emotional discomfort, compared to 26% among kindergarden kids.

Children from kindergardens demonstrate best adjustment during play activities (58.3 ± 4.2 points), while group home kids have the lowest adjustment levels (43.6 ± 7.8 points). Children attending health and fitness clubs have adjustment rate of 52.1 ± 5.4 points.

49% of kindergarden children, and 47% of health and fitness club children demonstrate readiness for school, while only 2% show that among group home children.

At the end of the experiment, the group home kids' psychological and emotional development status can be considered relatively favorable. 61% of these kids have shown adequate mental outlook, while 29% have indicated emotional discomfort.

The number of kids showing emotional discomfort in kindergarden has decreased to 16%. The number of children with emotional discomfort in health and fitness clubs has remained the same (14%) throughout the educational experiment.

The rate of social adjustment during play has increased in all three social groups. The biggest increase is observed among group home children, with a rise of 11.7%.

At the end of the experiment, the children's school readiness metrics have improved. 78% of kindergarden children, 83% of health and fitness club children, and 56% of group home children have demonstrated readiness for primary school education programs.

**IV. CONCLUSION**

Preparing children for attending school is an important psychological, educational and social challenge. Pre-school age children who live in different social situations can have particular issues of morphofunctional development, physical fitness and social adjustment.

An educational technology that involves physical training and sports while recognizing the pre-school kids' physical activities, can efficiently prepare children of different social groups for school education.

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