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INTERSUBJECT CONNECTIONS IN THE DEVELOPMENT OF COORDINATING ABILITIES OF PRIMARY SCHOOLCHILDREN WITH MILD INTELLECTUAL DISABILITY

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Key words: physical education, intellectual disability, coordination abilities, social adaptation, inclusive education.

Annotation. The purpose of the research is to experimentally test the possibility of including intersubject connections in the process of developing coordination abilities of schoolchildren in 3-5 grades of the I department of the special needs boarding school. The results of the study showed that for a more effective organization of the process of developing the coordination abilities of primary schoolchildren with mild intellectual disability, it is advisable to use intersubject connections and include in this process, along with the physical education teacher, other specialists working with this category of children, as well as parents (or legal representatives). In this study, the intersubject integration of physical culture was carried out with academic subjects like "Fine Arts", "Literature Reading" and "Mathematics". Within the framework of the pedagogical experiment, we implemented and developed an effective methodology for the development of the coordination abilities of primary schoolchildren with mild intellectual disability based on intersubject connections.

Introduction. Modern practice of physical education of primary schoolchildren with mild intellectual disability passes the stage characterized with an urgent need in innovational development contributing to coordination abilities' development of the I department schoolchildren, which is a main direction of their social adaptation.

Learning loads of the "Physical culture and health" subject in special needs boarding schools does not allow creating a "motor base" that contributes to the physiological need in motor activity, which subsequently affects the labor activity of individuals with mild intellectual disability, since they are able to perform such types of labor, for which motor activity is mostly typical.

Significance of coordination abilities and a need to develop them as one of the factors increasing the effectiveness of learning activity and social adaptation of primary schoolchildren with mild intellectual disability are proven in many studies.

Many researchers noted this issue. I.Yu. Gorskaya (2001) justified a software for diagnostics and improvement of coordination abilities in abnormal children [1]. S.F. Shamuratov, M.A. Pravdov and D.M. Pravdov (2018) studied features of developing an ability to differentiate muscle efforts within the system of adaptive physical education of primary schoolchildren with mild intellectual disability [2]. I.V. Vedernikova (2018) suggested a methodology of developing motor and coordination abilities of primary schoolchildren with mild intellectual disability using elements of sports games [3]. A.V. Buchelovskaya (2017) studied methods of diagnosing kinesthetic abilities of schoolchildren with mild intellectual disability [4]. O.A. Barabash (2007) justified a pedagogical technique of evaluating the development level of motor abilities of schoolchildren [5]. K.Yu. Krokhaliev (2007) demonstrated the effectiveness of using sensorimotor exercises when forming coordination abilities in schoolchildren [6]. E.S. Karkin and L.N. Skotnikova (2017) studied the development of motor abilities of primary schoolchildren with intellectual disability within the process of correcting pedagogical influence [7]. S.E. Uromova and E.V. Lenkova (2018) modified physical exercises used in rhythmic gymnastics classes [8]. O.V. Lanskaya and M.V. Manezhina (2019) developed and tested a program of classes for improving coordination abilities of 11-12 year old schoolchildren with intellectual disability [9]. S.F. Shamuratov and M.A. Pravdov (2014) studied an ability to differentiate muscle efforts in primary schoolchildren when performing working operations [10]. M.E. Snigur, T.A. Makarova (2016) suggested a list of outdoor games and proved their effect on the development of motor abilities of children with intellectual disability [11]. G.F. Gil'fanova, V.S. Kruglikova and L.Yu. Desyatkina (2020) scientifically justified a methodology of conducting classes for adaptive swimming aimed at correcting disorders of the motor field of children with intellectual disability and contributing their social and domestic adaptation [12]. D.A. Kalmykov (2019) developed a methodology of developing coordination abilities in children of primary school age with mild intellectual disability based on the competence approach [13]. D.A. Kasmakova and V.N. Porfir'ev (2018) defined an effect of soccer on coordination abilities of children with intellectual disorders [14]. V.V. Boldyreva (2008) studied motor abilities of children with intellectual disability using basketball [15]. A.V. Rubtsov, N.O. Rubtsova and A.V. Komarova (2020) studied influence of adaptive physical culture on the development level of coordination abilities of primary schoolchildren with intellectual disability [16]. N.P. Gorokhova (2020) examined an effect of table tennis on coordination abilities of 12-14 year old

schoolchildren with intellectual disability [17]. F.N. Davletshina and L.E. Kasmakova (2018) developed a set of outdoor games for correcting coordination abilities of 8-10 year old children with intellectual disability [18]. I.A. Sokolova and I.L. Izvekov (2020) suggested a set of exercises with a fit ball contributing to the development of coordination abilities in schoolchildren with intellectual disorders [19].

Despite the interest to this problem, there is still an urgent need for scientists, physical culture teachers, defectologists and practitioners to implement physical exercises influencing coordination abilities in the teaching and educational process of primary schoolchildren with mild intellectual disability as an important component of optimizing their learning activity and social adaptation [20].

The aforementioned issues served as a foundation for creating a methodology of developing coordination abilities in primary schoolchildren with mild intellectual disability based on using intersubject connections.

The purpose of the research is to experimentally test the possibility of including intersubject connections in the process of developing the coordination abilities of schoolchildren in 3-5 grades of the I department of the special needs boarding school.

Methods and organization. In order to achieve the set goal on different stages of the research, we used theoretical (abstraction, analysis and generalization of the scientific and methodological literature) and empiric (pedagogical experiment, observation, testing, questionnaire, mathematical statistics method) research methods. 3-5 grade schoolchildren (boys) of the I department (n=44), who were distributed evenly into the experimental and control groups ($P \leq 0,05$), participated in the research. The research was carried out in the special needs boarding school № 10 located in Minsk.

Results and discussion. Of all physical qualities, coordination abilities of primary schoolchildren with mild intellectual disability are the least developed and the most difficult to correct. The main reason for that are consequences of the brain cortex damage. It is needed to note that coordination abilities are shown not only when performing some complicated coordinated physical exercises in professional or amateur sports. They are also observed in everyday life of children with intellectual disability. They are simple locomotion (walking, running), routine actions etc., which is why in this case the coordination abilities' development is an important component of life of such schoolchildren.

Physical culture in a special needs school possesses great positive intersubject connections as an academic subject. This is the only subject, which solves problems of improving health, functional fitness, contributing to mental and physical performance. Physical culture and health-improving events in an academic day's

schedule create conditions for broadening intersubject connections within pedagogical process. In its turn, addressing of special education teachers to issues of physical culture on classes of the general education cycle contributes to the development of interest to physical culture, generalization, systematization and reliability of knowledge, forming generalized skills and abilities, and finally – to formation and development of a subject and metasubject competence [21]. Using intersubject connections in the education process of 3-5 grade schoolchildren of the I department allows maintaining a united methodological basis of subject system in whole, which in the long run would contribute to forming a healthy lifestyle, cognitive activity, development of coordination abilities of primary schoolchildren with mild intellectual disability.

Thus, based on regulations of theory and methods of physical education, adaptive physical culture, special needs and general education, taking into account modern studies in the field of physical education, development of motor qualities of children with intellectual disability, we developed a model [22] (fig. 1) and then – a methodology of developing coordination abilities of primary schoolchildren with mild intellectual disability based on intersubject connections.

The developed methodology was implemented in the education process of the experimental group of 3-5 grade schoolchildren of the I department of the special needs boarding school during an academic year. The key feature of the methodology is using the intersubject integration of the “Physical culture and health” subject with “Fine Arts”, “Mathematics” and “Literature Reading” subjects. The methodology also consists of including pedagogical influence on schoolchildren from not only a physical culture teacher (as it happens usually), but also the whole teaching staff of the special needs boarding school, as well as parents. The conducted pedagogical observation and analysis of classes of aforementioned academic subjects of the general educational cycle allowed revealing capabilities of the intersubject integration of physical culture in the special needs school for children with intellectual disability.

The physical culture class of the experimental group included preparatory, main and final parts. In the preparatory part, schoolchildren with mild intellectual disability performed exercises for developing coordination abilities while standing, walking, running and jumping: in the main part – while walking (passing different obstacles etc.) and jumping (on one leg, both legs, high jumps, broad jumps, tuck jumps etc.) on different routes and their combinations with different velocity, static exercises with different initial positions (standing, lying etc.), turns, bends; in the final part – concentration exercises while standing. All physical exercises were being learned gradually, from simple to complicated, and then they were included into gymnastic combinations. Moreover, the developed methodology includes

performing local and zone-based exercises on classes of “Fine Arts”, “Mathematics” and “Literature reading” subjects (schematic image of intersubject connections of physical culture in developing coordination abilities of primary schoolchildren with mild intellectual disability is shown on figure 2).

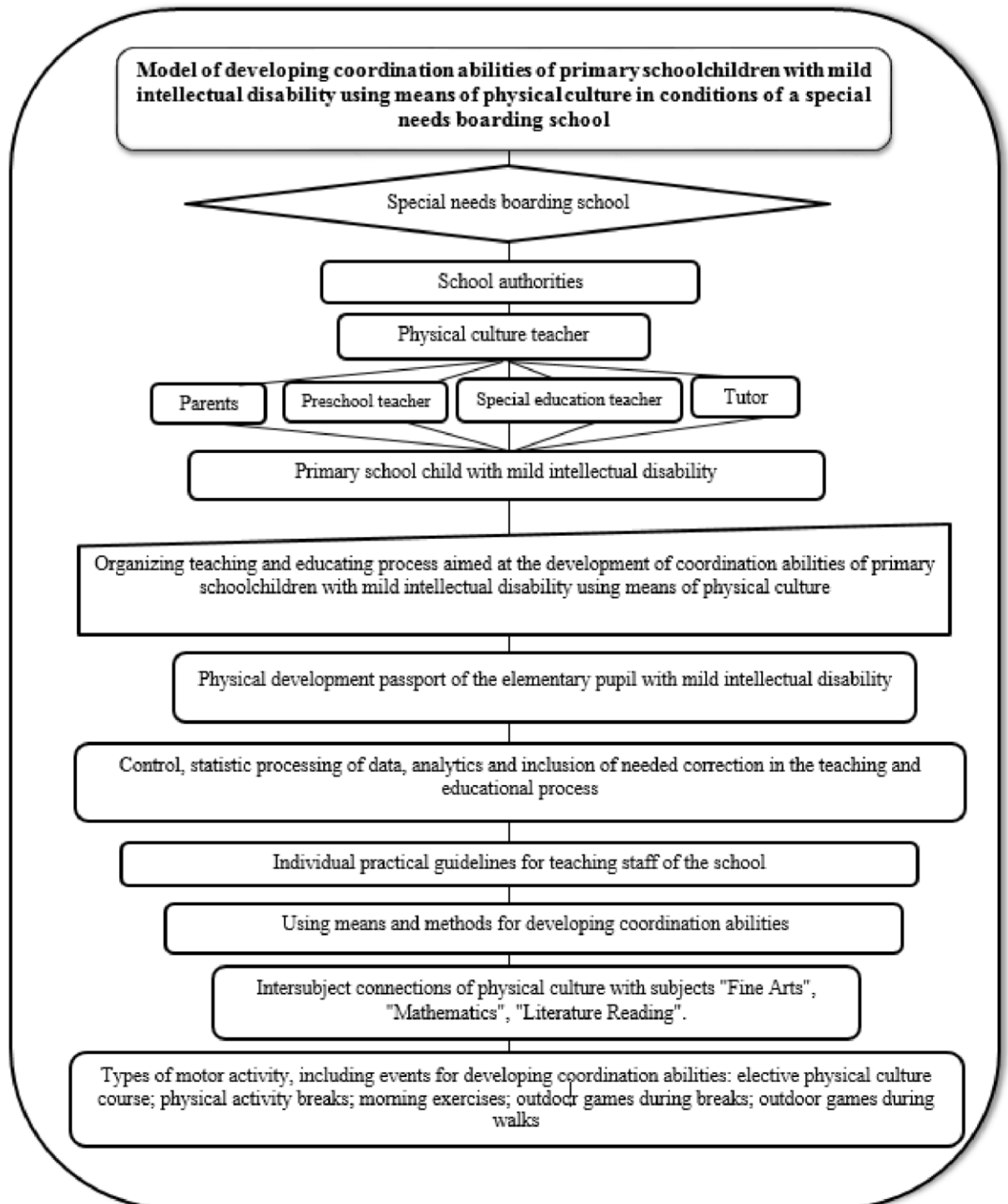


Fig. 1. Model of developing coordination abilities in primary schoolchildren with mild intellectual disability using physical culture means in conditions of a special needs boarding school

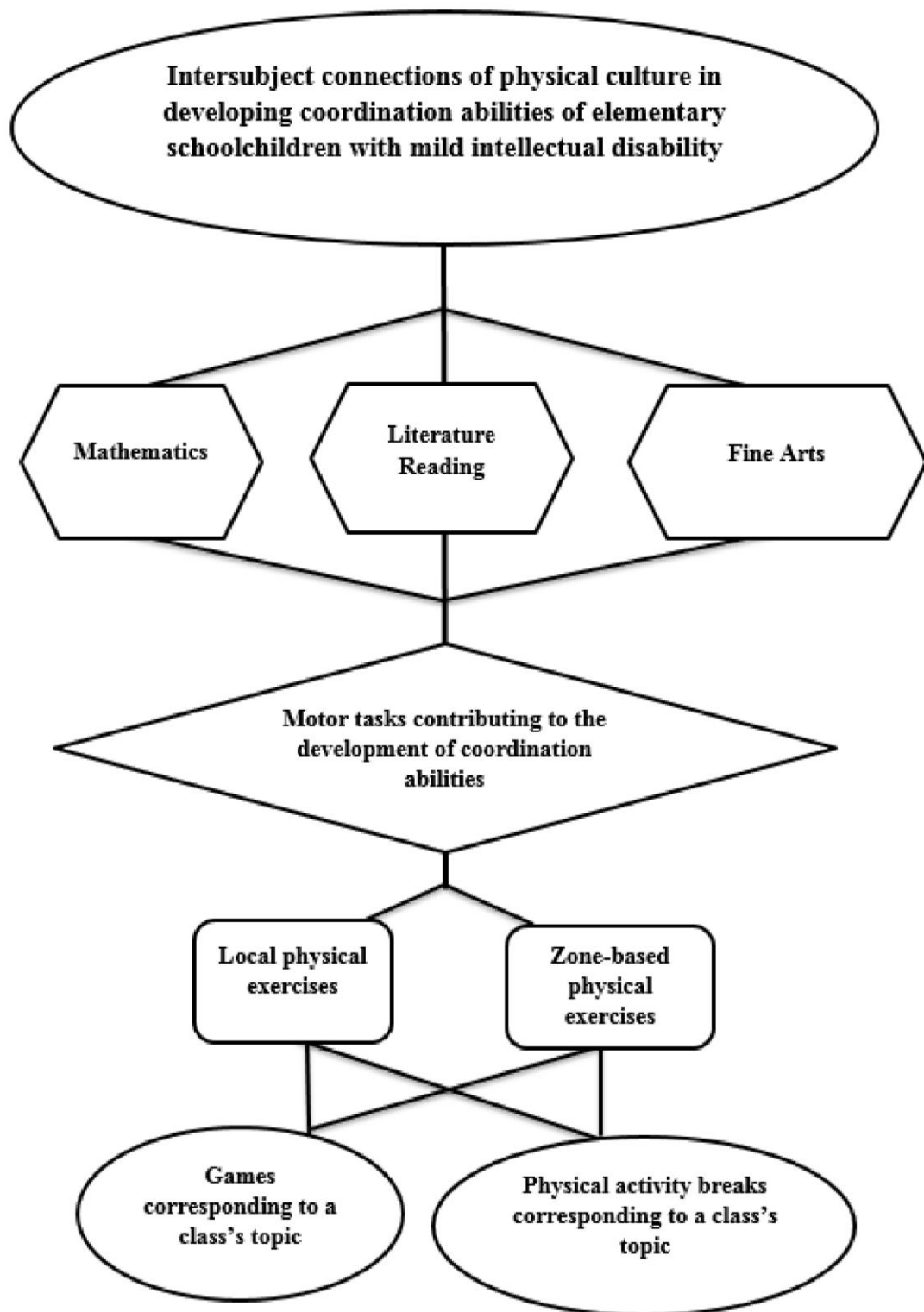


Fig. 2. Intersubject connections of physical culture in developing coordination abilities of primary schoolchildren with mild intellectual disability

Table

Arithmetic mean values of results of testing coordination abilities of 3-5 grade schoolchildren of the I department at the beginning and the end of the pedagogical experiment

Static balance			
Group	Results, points		Growth rate, %
	September	May	
Experimental	2,78	3,3	18,74
Control	2,8	2,98	6,38
Dynamic balance			
Group	Results, points		Growth rate, %
	September	May	
Experimental	3,02	3,61	19,6
Control	2,99	3,15	5,47
Spatial orienting ability			
Group	Results, points		Growth rate, %
	September	May	
Experimental	2,84	3,53	24,16
Control	2,8	2,89	3,12
Ability to differentiate and kinesthetic ability			
Group	Results, points		Growth rate, %
	September	May	
Experimental	2,08	2,37	14,1
Control	2,11	2,22	5,44
Ability to preserve and repeat a set rhythm			
Group	Results, points		Growth rate, %
	September	May	
Experimental	2,97	3,51	18,24
Control	3,01	3,2	6,3
Response ability			
Group	Results, points		Growth rate, %
	September	May	
Experimental	3,02	3,98	32
Control	2,99	3,35	12,3

Applying the methodology contributed to achieving higher level of the development of coordination abilities of primary schoolchildren with mild intellectual disability of the experimental group (table). In particular, indicators of static balance improved (was evaluated using the “Stork” test, s). In our opinion, positive changes occurred due to performing motor tasks on “Physical culture and health”, “Fine arts”, “Literature reading” and “Mathematics” classes, designed by the methodology. Dynamic balance (was evaluated using the “Walking on the bench” test, s) was developing in children of the I department with the use of physical exercises with different velocity (walking and passing obstacles, running on different routes etc.). On “Fine Arts”, “Literature Reading” and “Mathematics” classes, schoolchildren performed physical activity breaks, which included exercises

that contributed to the development of dynamic balance and corresponded to a class's topic. Systematic performance of physical exercises for developing coordination abilities under the lead of not only a physical culture teacher, but also other teaching staff of the special needs boarding school contributed to an improvement of results in a spatial orientating ability (was evaluated using the "Ball throw" test, number of hits) of the experimental group's schoolchildren. When analyzing data from the table, we also noted that an ability to differentiate and a kinesthetic ability (was evaluated using the "Repeating the half of the maximum broad jump", cm) improved in schoolchildren. In this case, we used tasks with gradual increase and decrease of spatial characteristics related to distance (e.g. throwing the ball at a target with the right/left hand from long distance, then from close distance, the target was static and moving; performing broad and high jumps with different muscle efforts etc.), which required from primary schoolchildren to differentiate muscle efforts and contributed to an increase in distinctiveness of muscle-motor perception. A combination of performed exercises for developing coordination abilities both on physical culture classes and classes of the general educational cycle allowed increasing significantly a development level of preserving and repeating a set rhythm (was evaluated using the "Dribbling" test, a number of tries).

Thus, the results obtained during the pedagogical experiment demonstrated that the methodology of developing coordination abilities of primary schoolchildren with mild intellectual disability based on intersubject connections is effective (the growth rate of results in the experimental group was 21,14%, in the control group – 6,5%) and allows organizing the development process on a higher level. The results obtained also allowed us to suggest that in order to develop coordination abilities of such children it is advisable to use the intersubject integration, physical exercises for developing coordination abilities, performed under the lead of not only the physical culture teacher, but also other teaching staff of the special needs school, which is proposed by the developed methodology.

Conclusion. Results of the conducted study indicate the effectiveness of using intersubject connections of 3-5 grade students of the I department of the special needs school. The intersubject integration of the "Physical culture and health" subject was carried out with "Fine Arts", "Mathematics" and "Literature Reading" subjects.

Practical implementation of the methodology of developing coordination abilities of primary schoolchildren with mild intellectual disability approved its effectiveness. We registered pronounced positive dynamics of coordination abilities indicators in 3-5 grade schoolchildren of the I department of the special needs boarding school.

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