

Activating the Cognitive Process of Schoolchildren Through a Gender-Based Approach to Learning

Gulyamov Djakhangir Rakhmatullaevich¹; Abdusalomova Maftuna Sheralievna²; Kholboyeva Yakhshigul Toyirovna³

¹Associate Professor, Candidate of Pedagogical Sciences, Navoi branch of the Academy of Sciences of the Republic of Uzbekistan, Uzbekistan

² Doctoral student of the Navoi Department of the Academy of Sciences of the Republic of Uzbekistan, Uzbekistan

³ Master Student of the Navoi State University of the Republic of Uzbekistan, Uzbekistan

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Abstract

Introduction / Relevance. The strategy of thinking, the type of attention and memory, as well as the mechanisms of assimilation of information are associated with gender differences in all children. The preparation of didactic tasks taking into account the gender aspects of children in preparation for educational activities, i.e. ensuring the gender orientation of the lesson process, contributes to the harmonization of individual profiles of lateralization of the teacher-educator and children, understanding and assimilation of educational information by children. To do this, it is necessary that educators diagnose the peculiarities of the organization of children's cognitive processes based on gender characteristics and conduct the educational process based on its results. Gender orientation of the educational process can be an effective step in ensuring gender equality of students.

Methods. The method "Your Style of Learning and Thinking, SOLAT" was used to determine the preferred hemisphere of children, which was developed by the American psychologist E.P.Torrens (co-authored with C.R.Reynolds, T.Riegel, O.E.Ball); in the context of gender differences, the children's thinking strategy was determined using the test "Local diagnosis of hemispheric functions The brain" was developed by A.L. Sirotyuk, and the preferred representative systems are the "Methodology for the development of the leading modality". Indicators of the formation of children's knowledge and skills in elementary mathematics were determined on the basis of didactic tests, conversations and the method of purposeful pedagogical observation.

Results. Gender characteristics are linked to the physiological and socio-psychological traits of an individual and are reflected in how their emotional and volitional processes function, as well as their perception mechanisms, thinking systems, attention, and memory. Experimental work has confirmed our scientific hypothesis that organizing educational activities for older preschool children using a gender-based approach increases their cognitive activity.

Conclusions: Gender equality in education means that girls and boys should receive the same opportunities and quality education, regardless of their background or abilities. To achieve this, teachers must adopt a gender-inclusive approach in their teaching methods. The gender approach of education is a methodological approach that takes into account the unique characteristics of each child, including their thinking strategies, perception, and information assimilation mechanisms. This approach aims to help develop each child's unique personality, while also helping to mitigate gender differences and free them from limiting gender stereotypes. In order to organize educational activities based on a gender-sensitive approach, it is necessary to identify the student's individual characteristics, including gender-specific traits. This involves diagnosing their thinking strategies, utilizing neuropedagogical diagnostic methods, and identifying their specific features in terms of how they perceive and assimilate information. Based on the results of these assessments, appropriate forms, methods, and learning tools can be selected and applied throughout the learning process. The formation of creative thinking and cognitive activity in preschoolers, as well as the possibilities for children to adapt to social life and the modeling of the educational process with consideration for gender characteristics, all contribute to increasing their social and cognitive abilities.

Keywords: Gender Trait; Gender Orientation; Leading Hemisphere; Thinking Strategy; Representative System; Individual Literation Profile; Cognitive Activity; Cognitive Process

Introduction

Being the main link in the global education system, the preschool education organization is one of the most significant and urgent issues in education and training of young learners. When teaching children in countries such as the United States, Russia, Germany, Japan, Great Britain, and South Korea, significant attention is paid to the development and implementation of educational programs and methods aimed at further fostering their cognitive abilities.

It is essential that in the preschool education systems of these countries, the focus of teaching and upbringing is not only on acquiring basic knowledge, skills, and abilities appropriate for their age level, but also on developing their speech, mental, and moral qualities. This approach is reflected in the research and work of scholars in this field, which finds its reflection in the scientific literature. At the same time, it is essential to ensure the smooth transition of children from a preschool educational institution to the next stage of their education, as well as the development of their cognitive skills, early identification of their abilities and talents.

In modern times, the organization of the educational process must focus on personal growth, socialization, and the development of skills such as independent and critical thinking. To further develop the preschool education sector in Uzbekistan, several regulatory legal acts have been enacted in recent years. These documents aim to educate students with a healthy and balanced personality and create all conditions for their intellectual, moral, aesthetic, and physical development.

The decree of the President of Uzbekistan dated May 8, 2019 (No.) outlines specific goals and objectives for the development of education in the country. The project "On the approval of the Concept for the development of the preschool education system in the Republic of Uzbekistan until 2030" aims to form a comprehensive and mature personality in children through the use of innovative methods and techniques in education and upbringing. It also focuses on providing the system with modern educational materials and literature, as well as introducing innovative ideas and advanced pedagogical technologies into the educational process.

The organization of the educational process in preschool educational institutions based on a gender-sensitive approach, taking into account the specific needs and characteristics of girls and boys, can be seen as one possible solution to these challenges. Gender-responsive education involves organizing the

learning process in a way that takes into account each child's individual abilities and needs. This approach helps to develop children's skills in independent, creative, and critical thinking as well as such qualities as independence, initiative, and responsibility.

Research Methods

Research methods. The period of preschool age is not only a stage of preparing children for school, but it is also a time when the foundations of an individual's personality are formed and developed. During this period, children develop their creative imagination, learn to control their behavior, imitate others (most often adults), and develop imaginative thinking and "social" feelings. The most active period of this development takes place before children reach the age of 5-6 years, which is when the period of a child's personal development begins. The issues of organizing the educational process in Uzbekistan, taking into account the individual characteristics of children, were studied by E.Gaziev, T.Nishonova, D.A.Chorieva, D.M.Kadyrova, M.X.Nurmatova, N.M.Karimova, D.B.Khakimova, V.D.Sadrikov, M.X.Nurmatov. The role of neuropedagogic science in gender-sensitive education of children, practical issues of neuropedagogic diagnostics and neurodidactics H.I.Ibragimov, DJ.Gulyamov and K.M.Nurboev, opportunities for learning based on gender equality and differences in the higher education system B.Khodjaev, G.M.Kurbanova and K.X. This is stated in the study of the allaberidevs.

Questions of the organization of the educational process aimed at the development of the child's personality in preschool educational organizations in the Commonwealth of Independent States (CIS), taking into account gender characteristics, individual psychological, and age-related aspects of boys and girls, were investigated by T.P. Khrizman, A.N.Leontiev, D.B.Elkonin, V.D.Yeremeeva, and V.V.Davidov. These researchers included V.A.Slastenin, E.P.Goda, A.L.Sirotyuk, A.V.Svetkov, A.N.Belkova, Yu.Yu.Berezina, E.X.Giniyatullina, A.O.Glebova, and V.V.Kozhevnikova. In their research, they also took into account the peculiarities of information assimilation by boys and girls. The goal of their work was to identify ways to improve the quality of education by considering these aspects in the educational process.

In terms of the mental and cognitive development of preschool children in foreign countries, as well as the functional development of specific areas of brain activity in each child at an early age, there is a need to pay particular attention to this during the learning process. V.Frankl, T.Parkinson, Eric R. Kendel, M.J.Neuman, A.E.Deverselli, K.D.Amponsa, R.Jansen, Dayana Farziha Ali, J.D.Silverman, I.Choi, P.Gleason, R.Hoff and Marie Todd examined the gender characteristics and problems of girls and boys in their studies. They found that girls tend to rely on analytical strategies when solving spatial problems, while boys prefer holistic approaches.

John Dewey, Kate Burke Walsh, Jean Piaget, S.Kuger, K.H.Christian, H.Gibbons, R.Kramer, G.V.Leonidova, I.I.Svirelkina and N.G.Ogelman explored the potential for children's adaptation to social life in their research. The researchers studied the issues related to modeling the educational environment with the aim of taking into account the specific ways in which boys and girls absorb information, as well as the development of cognitive activity and creativity in children, and how to strengthen these aspects in their development.

In the scientific work of N.Sh.Abdullayev, devoted to improving preschool education through a variable approach, there is a focus on the need to consider the age, psychological, and intellectual aspects of children when designing educational programs in order to improve the quality of preschool education. The use of learning technologies that take into account individualization and differentiation is emphasized, as well as the development of children's creative abilities. Additionally, the development and implementation of methodological support for the formation of independent thinking is discussed. As the basis for this variable approach, Abdullayev emphasizes the importance of variability in educational technologies, learning trajectories, and individualized learning.

To organize a gender-oriented educational environment, educators and educational psychologists of preschool educational organizations should ensure a comprehensive and in-depth knowledge of the child's personality, its psychophysiological characteristics, mechanisms of perception and assimilation of information, as well as take into account gender characteristics and aspects D.R.Gulyamov, K.B.Kalankhodzhaeva, S.R.Mansurova [8], [9], [10], [12] as well as N.Yunusova and V.J.Anvarova [24] which he recommended in his scientific research.

A number of principles of the preschool education model based on a gender approach are defined in Z.T. Kholmatova's research,: - the principle of preserving physical, psychological, social, and spiritual health; - the principle of conformity to nature is implemented in the content of education aimed at defining male and female individuality, fostering a culture of interaction between the sexes, masculinity and femininity; - the principle of complexity is a set of tools and is manifested in the use of integrative programs. Integration processes can manifest themselves in various forms: the creation of a set of elective academic disciplines; the need to create forms and methods of education taking into account the gender factor is outlined. The use of the proposed model as a tool for working from preschool age and the development of programs not only allow us to analyze and develop factors affecting the disclosure and development of the potential of boys and girls, but also to make adjustments to the system itself, the conditions of its functioning, he says [23].

By "updating the content of the preschool education system," D.A.Sharafutdinova meant ensuring a teacher's personality-oriented communication with children. Pedagogical improvisation is widespread in everyday practice, it allows teachers to choose appropriate methods, means and forms of communication with a child in a given situation. In order to implement an individual approach in the educational process, it is important to support the individual interests and needs of each child, taking into account his uniqueness and uniqueness. The development centers emphasize the interest of children in entering into communication through observation and the need to create a stimulating environment, timely adaptation of the necessary conditions to the changing needs of children [20].

R.G.Safarova believes that taking into account the purpose of the activity and the specific cognitive capabilities of the children's collective as an integral system of didactic and educational means allows you to organize the educational process based on the mental abilities, capabilities of children and the goals of the educational process [16].

D.V.Khakimova studied the age and sex-related characteristics of cognitive development in children aged 5-7 and found a strong manifestation of psychological traits in both boys and girls aged 5. The study found that the development of cognitive abilities in children at this age is influenced by age and gender, and that boys and girls exhibit their individual characteristics differently. The researcher also found that there are differences in the abilities, skills, and needs of each child in a group when organizing an educational process.Eric R. Kendel noted that the artificial acceleration of the process of parenting, although it accelerates the pace of development of children, can negatively affect their maturation as a person. While the artificial acceleration of the process of education and upbringing of children, it would seem, accelerates the process of "social adaptation", the requirement for them to acquire certain knowledge and skills during educational activities with children whose mental formation is not completed in relation to their age, in accordance with a strictly defined curriculum, can slow down the normal process mental development. As a reason, children may experience an early "extinction" of educational motivation and protective neurotic reactions [5].

In A.L.Sirotyuk's research, the need to take into account several important aspects of teaching young children in preschool education was highlighted. It is emphasized that when organizing educational work with preschoolers, the purpose of each lesson must be clearly defined and when organizing the cognitive process, specific qualitative changes should be achieved. The scientist acknowledges that for the normal development of preschoolers' psyche by age periods, it is necessary to consider the peculiarities of brain organization by age when planning training sessions [21].

V.D.Yeremeeva and T.P.Khrizman, based on their scientific research in pedagogical neuropsychology, concluded that the use of interactive game methods by teachers creates specific social conditions for active development of a child's psyche at different age stages. This approach has a positive impact on the development of brain components and systems. Therefore, they recommend that preschoolers should use interactive games in small groups and individually, taking into account their active mental development. Fairy tales, toys, and other creative activities are particularly effective in fostering individuality in young children.V.Frankl, T.Parkinson bolalarning aqliy rivojlanishi, idrok etishi, shuningdek, har bir bolani yosh davrida miya "quvvati" muayyan boʻlaklarining funksional rivojlanishi ularning gender farqlari bilan bogʻliq ravishda turlicha kechishi masalalarini tadqiq etganlar [6].

In his study, Neuman argues that teaching children, from an early age, the social value of parents and family members is important. He emphasizes the role of boys as future breadwinners and protectors of the family and the importance of girls' maternal and caring qualities. The author emphasizes the significance of family relationships in shaping gender characteristics.

In his research, Amponsa considers the issue of educating boys and girls. He argues that the arrangement of a room and its small details can influence a child's perception of the world and their gender identity. He scientifically justifies the need for a differentiated approach to education, taking into account differences in vision, hearing, and understanding between boys and girls. In his research work on gender inequality and gender inequality, Gleason concluded that the organization of single-sex classes, the education of boys and girls in a separate educational environment based on special educational programs has an impact on the quality of education [7].

We disagree with Gleason's opinion. We believe that coeducation of boys and girls is beneficial for their overall development, and socialization plays a crucial role in making the process more smooth. In her research, Marie Todd has recognized that, in teaching girls and boys, it is important to consider their gender stereotypes from an early age. A positive approach to this issue can effectively influence the socialization of children.

O.N. Pichugina believes that one of the fundamental principles of active, formative, and developmental learning in preschool education is to take into account the unique characteristics of children's information assimilation. She emphasizes that the following pedagogical conditions are essential for this: ensuring that children have a solid foundation of knowledge and understanding, being in a loving environment, having thorough theoretical training for teachers, and fostering children's critical thinking and analytical skills.

G.A.Aydalieva acknowledges the significance of socialization and individualization in children's development. Socialization refers to the process by which a growing individual assimilates socially approved ideals, norms, and ways of behaving and acting. Individualization, on the other hand, is the process through which a person's uniqueness is expressed in their specific appearance, inner world, and lifestyle.

T.G.Makuseva sees the achievement of educational standards, increased self-education, and the cognitive activity of children as the main goals of parenting.

In all studies, several features of the cognitive processes in girls and boys have been noted. One of these is that the ways in which boys and girls perceive and process information differ from an early age. Boys tend to rely on a system of direct, isomorphic sensory perceptions, while girls rely on a more symbolic approach based on logical analysis of sensory representations.

Results

Based on the analysis of the above studies, a model for organizing educational activities of children on the basis of a gender approach was developed. This model is made up of targeted, meaningful-

process and evaluative-mezzanine blocks. The target block sets the goal of organizing educational activities on the basis of a gender approach.

The meaningful-process block presents the content of the forms and methods used in teaching, taking into account the gender characteristics of the upbringing; tasks for the formation of a person with creative qualities are established; the content of educational-methodological support (animations, multimedia tools, rollers, etc.).) and the forms, techniques and tools used (i.e.,technical tools, visual weapons, cards with pictures of images, posters, objects and objects, handouts, lepbuks) of the training conducted on the basis of the gender approach are presented.

In order to determine on the basis of certain norms the development of knowledge, skills and qualifications of those brought up in the evaluator-zone block, descriptions of the higher, middle, lower and very low levels have been developed.

Motivational, cognitive approach and creative-functional criteria for determining the development of knowledge and skills of children in elementary mathematics in the training process are reflected: motivational criterion: manifestation of the need for knowledge, independence and rapid level were observed; cognitive approach: the wealth of imagination in the educator is determined by the fact that he listens to, realizes,; the creative approach, logical thinking, decision-making what it is like, the ability to evaluate and be able to complete the assignment is observed in the creative-functional criterion.

In the training process, it was recommended to individualize the educational process by synthesizing and presenting information based on gender differences of children, taking into account their thinking strategies. In this case, the information and assignments provided by the subject of the pedagogical process are interpreted in at least two options:

the first option is to perform inductive operas by representing data analytically, classifically, abstractly, algorithmically. The presentation of information in this way encourages girls to analyze problems and look for solutions in a logical way;

the second option – data and assignments are intended for boys with an emotional-emotional, figurative-intuitive strategy of thinking, which directs images to perceive in one whole, to figurative thinking.

The synthesis and imitation of data from children's gender differences was carried out in three stages: preparatory, basic and final.

- 1. Tasks performed at the preparatory stage:
 - Determination of the gender composition of the group and individual lateration profiles of Borla through the means of neuropedagogical diagnostic methods;
 - Determination of the ratio of children in the group by gender differences;
 - -Preparation (collection) of educational and methodological materials to explain each topic in a homogeneous way.
- 2. Tasks performed at the main stage:
 - Control over the reception and work of information, the performance of tasks and tasks in the process of training from the point of view of gender characteristics of children;
 - Assignment of children with the same laterality in pairs or in small groups;

- To refer to children a task completed on the topic mentioned, their option that is contrary to gender characteristics, and to observe how they perceive information.
- 3. The final stage is the introduction of information on the work performed and the changes that have occurred on the development maps of children.

Experimental testing of this approach was carried out in three stages-clarifying, formative and closing.

A total of 149 educators were selected from Navoi Region No. 21 and No. 22, Samarkand region No. 18 and No. 29, and Bukhara Region No. 55 and No. 31 preschool educational organizations to conduct pilot work in the clarifying phase of the pilot test (2021).

Experience and control groups, data on gender characteristics and dominant hemispheres of adult children, are listed in Table 1.

Table 1.Relationship between child sex and dominant hemisphere (Method of determining the leading hemisphere through the leading pair organs)

	Leading h groups (%	emispherici	ty in control	Leading hemisphericity in experimental groups (%)				
Sex of children	Right hemisphere leader	Left hemisphere leader	Mixed hemispherical	Right hemisphere leader	Left hemisphere leader	Mixed hemispherical		
girls	16	59	25	19	57	24		
boys	50	26	24	62	12	26		
Overal	70	-	·	79		•		

Experimental and control groups, data on the representative systems preferred by adult children, were summarized in Table 2.

	Represe	entative sy control gr	stem prefe coups (%)	erred in	Representative system preferred in experimental groups (%)						
Sex of children	Visual	Audial	Kinestetic	Discrete	Visual	Audial	Kinestetic	Discrete			
Girls	16	59	16	9	8	57	24	11			
Boys	74	5	8	13	74	-	9	17			

Table 2. Children's preferred representative systems (Determined by the "use of words" method

Based on the analysis of the results of diagnostics, neuropedagogic reliefs of groups were identified in the cross section of gender aspects, thinking strategies and preferred representative systems of children.

At the formative stage of our study (2022-2023.y.) on the basis of the educational process, the gender approach was tested by experience in adult educators groups of selected preschool educational

organizations. Based on the" requirements of the state standard of preschool education and upbringing", 16 topics in elementary mathematics were supplemented with gender-oriented didactic materials and were used in educational activities.

Classes in elementary mathematics with the pupils of control groups were organized in a traditional way.

At the final stage of the experimental and test work, the dynamics of the transformation of children's qualifications in elementary mathematics was analyzed (Table 3).

In control groups (%) In experimental groups (%) low too Medium high Medium low high low low too Sex At the conclusion of the experiment Up to the experience Up to the experience Up to the experience Jp to the experience Jp to the experience Jp to the experience Up to the experience Up to the experience 44 51 31 15 3 53 39 5 3 Girls 31 19 4 32 19 6 6 3 39 3 47 40 47 Boys 44 36 36 19 14 19 4 7 2 6 6 4

Table 3. Comparative analysis of the formation of knowledge and skills in mathematics in children

In particular, the ratio of girls with high elementary math skills in the control group increased by 7% (from 44% to 51%). This rate increased from 39% to 44% in boys, with a change of 5%. Elementary mathematics qualifications-the amount of girls and boys in the intermediate level remained the same (girls 36%; boys 31%). Elementary math proficiency was a decrease of 4% (19% to 15%) for lower-level girls, while in the boys ' group the rate fell from 19% to 14%. The level of elementary mathematics qualifications has decreased by 3% (6% to 3%) in girls in control groups, but in the boys group this rate has remained unchanged.

Girls with high levels of elementary math skills in the experimental group had a 10% increase (from 43% to 53%). This rate increased from 34% to 47% in boys with a growth dynamics of 13%. In the experimental group, the rate of B'lgan girls with intermediate elementary mathematics qualifications rose from 32% to 39%, increasing by 6%, while in boys this positive dynamics was 7% (growing from 40% to 47%). In the experimental group, elementary mathematics qualifications decreased by 14 % (from 19% to 5%) in low-level girls, while in the boys group this figure was 15% (i.e., decreased from 19% to 4%). In these groups, the amount of girls with very low levels of elementary mathematics qualifications decreased from 6% to 3%, while in boys this figure fell from 7% to 2%.

Thus, in the process of the formative stage of our experimental work, elementary mathematics qualifications to the control group increased by 7% of high-level girls and 5% of boys, while in the experimental group Girls of this category - by 10% and boys-by 13%.

The quantitative indicators of girls (36%) and boys (31%) with intermediate levels of elementary mathematics qualifications in the control group remained the same. However, in the experimental group, the amount of girls and boys with intermediate elementary mathematics qualifications increased equally from 7%.

This dynamic was due to a decrease in the ratio of low knowledge, skills and proficiency in experimental groups to low children (girls – from 19% to 5%; boys – from 19% to 4%) and very low (girls-from 6% to 3%; boys-from 7% to 2%).

The overall decrease in the ratio of children with low and very low levels of knowledge, skills and skills in control groups did not exceed 5%.

The growth of knowledge, skills and qualifications of educators in elementary mathematics under the influence of experiments with quality indicators, analysis of statistical data conducted in experimental and control groups are presented in histograms and graphs. For the theoretical justification of these indicators, the Pearson distribution of Mathematical-Statistics was used.

Experience and control groups the general indicators of the quality of knowledge, skills and qualifications of educators before and after experience are presented in Table 3.3.1, which is indicated in the criteria "high", "average", "low", "very low". These indicators are respectively"5", "4", "3", "2" we will mark with grades.

Pre-experimental evaluation of female children in the experimental and control group taking the results as 1st and 2nd samples, respectively, we form the following variational Series necessary for the Pearson distribution:

	Sample 1										
Experi-	Xi	5 (very good)	4 (good)	3 (satisfactory)	2	Total					
mental					(unsatisfactory)	average					
group	ni	53	39	5	3	n = 100					
				Sample 2							
Control	uj	5	4	3	2	Total					
group						average					
	mj	44	31	19	6	m = 100					

Table 4. Assessment of girls in the experimental and control group before the experiment results

1- formula Using Pearson's χ^2 Distribution (see formula 1:)

$$\chi^{2} = n_{1}n_{2}\sum_{j=1}^{m} \frac{1}{n_{1j} + n_{2j}} \left(\frac{n_{1j}}{n_{1}} - \frac{n_{2j}}{n_{2}}\right)^{2} = \frac{1}{n_{1}n_{2}}\sum_{j=1}^{m} \frac{\left(n_{1j}n_{2} - n_{2j}n_{1}\right)^{2}}{n_{1j} + n_{2j}}.$$
 (1)

By separating the subjects into an experimental and control group, getn we check the statistical results based on the χ^2 criterion with a critical value $\chi^2_{\kappa p} = 7,815$ corresponding to the degree of freedom k = n - 1 and the degree of value $\alpha = 0,05$.

From the results reflected in the histogram, it can be said that it is possible to foresee that even the corresponding average values for the selections satisfy the given conditions. We calculate the mean values using the following formula (see formula 2 and 3.):

$$\bar{X} = \frac{1}{n} \sum_{i=1}^{4} n_i x_i \quad (2);$$
$$\bar{Y} = \frac{1}{m} \sum_{j=1}^{4} m_j y_j \quad (3)$$

This service shows that in the experimental group, the middle sale is higher than the control group, that is, the self .

Now we calculate the dispersions for both groups:

$$\begin{split} \overline{X^2} &= \frac{1}{n} \sum_{i=1}^4 n_i x_i^2 \qquad ; \quad \overline{Y^2} = \frac{1}{m} \sum_{j=1}^4 m_j y_j^2 \\ D_n &= \overline{X^2} - (\overline{X})^2 = 20,06 - 19,5 = 0,56 \\ D_m &= \overline{Y^2} - (\overline{Y})^2 = 17,91 - 17,06 = 0,85, \\ D_n &< D_m, \\ \chi^2 &= \frac{1}{n_1 n_2} \sum_{j=1}^4 \frac{\left(n_{1j} n_2 - n_{2j} n_1\right)^2}{n_{1j} + n_{2j}} \\ &= \frac{1}{100 \cdot 100} \left(\frac{\left(53 \cdot 100 - 44 \cdot 100\right)^2}{97} + \frac{\left(39 \cdot 100 - 31 \cdot 100\right)^2}{70} + \frac{\left(5 \cdot 100 - 19 \cdot 100\right)^2}{24} + \frac{\left(3 \cdot 100 - 6 \cdot 100\right)^2}{9} \right) = 10,92 \\ \chi^2_{exp} &= meaning > \chi^2_{cont} = 7,815 \end{split}$$

After the experiment, the Pearson distribution variational series representation for the 1st and 2nd selections of the results of the evaluation of female children in the experimental and control group is as follows (Table 5):

The reliability of the result was also confirmed in the χ^2 criteria. So, with the value level of the Experimental Group $\alpha = 0.05$, it can be said that the average of the experimental group is higher than the average of the control group

After the experiment, the Pearson distribution variational series representation for the 1st and 2nd selections of the results of the evaluation of female children in the experimental and control group is as follows (Table 5):

Table 5. After the experiment,	the results of	of the	evaluation	of girl	children	in the	group	of exp	erience	e and
			control							

		Sample 1										
Experiment al group	Xi	5 (very good)	4 (good)	3 (satisfactory)	2 (un satisfactory)	Total average						
	ni	51	31	15	3	n = 100						
				Sample 2								
Control	uj	5	4	3	2	Total average						
group	mj	34	40	19	7	m = 100						

$$\bar{X} = \frac{1}{n} \sum_{i=1}^{4} n_i x_i = \frac{1}{100} (51 \cdot 5 + 31 \cdot 4 + 15 \cdot 3 + 3 \cdot 2) \approx 4,3$$
$$\bar{Y} = \frac{1}{m} \sum_{j=1}^{4} m_j y_j = \frac{1}{100} (43 \cdot 5 + 32 \cdot 4 + 19 \cdot 3 + 6.2) \approx 4,12$$

It can be seen that in the experimental group, the average acquisition is higher than in the control group, i.e $\overline{X} > \overline{Y}$..

Now we calculate the dispersions for both groups:

$$\begin{split} \overline{X^2} &= \frac{1}{n} \sum_{i=1}^{4} n_i x_i^2 = \frac{1}{100} (51 \cdot 5^2 + 31 \cdot 4^2 + 15 \cdot 3^2 + 3 \cdot 2^2) \approx 19,18 \\ \overline{Y^2} &= \frac{1}{m} \sum_{j=1}^{4} m_j y_j^2 = \frac{1}{100} (43 \cdot 5^2 + 32 \cdot 4^2 + 19 \cdot 3^2 + 6 \cdot 2^2) \approx 17,82 \\ D_n &= \overline{X^2} - (\overline{X})^2 = 19,18 - 18,49 = 0,69 \\ D_m &= \overline{Y^2} - (\overline{Y})^2 = 17,82 - 16,97 = 0,85, \\ D_n &< D_m, \\ \chi^2 &= \frac{1}{n_1 n_2} \sum_{j=1}^{4} \frac{\left(n_{1j} n_2 - n_{2j} n_1\right)^2}{n_{1j} + n_{2j}} \\ &= \frac{1}{100 \cdot 100} \left(\frac{\left(51 \cdot 100 - 443 \cdot 100\right)^2}{90} + \frac{\left(31 \cdot 100 - 32 \cdot 100\right)^2}{130} + \frac{\left(15 \cdot 100 - 19 \cdot 100\right)^2}{87} + \frac{\left(3 \cdot 100 - 6 \cdot 100\right)^2}{22}\right) = 17,7 \\ \chi^2_{\text{exp}} &= 17,7 > \chi^2_{\text{cont}} = 7,815 \end{split}$$

The reliability of the result was also confirmed in Criterion χ^2 .

B. The results of the evaluation of boys in the pre - experimental experiment and control group for the 1st and 2nd samples yield the variation series of the Pearson distribution as follows (Table 6):

	Sample 1												
Experi-mental	Xi	5(very good)	4 (good)	3 (satisfactory	/)	2 (unsatisfacto	ory)	Total average				
group	ni	47		47	4 2			n = 100					
	Sample 2	Sample 2											
Control group	uj	5	4		3	2		Tot	al average				
	mj	39	36		19	6		m =	100				

Table 6. Variational series of boy assessment results

Using Pearson's χ^2 distribution

.

$$\bar{X} = \frac{1}{n} \sum_{i=1}^{4} n_i x_i = \frac{1}{100} (47 \cdot 5 + 47 \cdot 4 + 4 \cdot 3 + 2 \cdot 2) \approx 4,39$$
$$\bar{Y} = \frac{1}{m} \sum_{j=1}^{4} m_j y_j = \frac{1}{100} (39 \cdot 5 + 36 \cdot 4 + 19 \cdot 3 + 6 \cdot 2) \approx 4,08$$

This value shows that in the experimental group, the average acquisition is higher than in the control group, i.e. $\overline{X} > \overline{Y}$, the gearing is.

Now we calculate the dispersions for both groups:

$$\begin{split} \overline{X^2} &= \frac{1}{n} \sum_{i=1}^4 n_i x_i^2 = \frac{1}{100} (47 \cdot 5^2 + 47 \cdot 4^2 + 4 \cdot 3^2 + 2 \cdot 2^2) \approx 19,83 \\ \overline{Y^2} &= \frac{1}{m} \sum_{j=1}^4 m_j y_j^2 = \frac{1}{100} (39 \cdot 5^2 + 36 \cdot 4^2 + 19 \cdot 3^2 + 6 \cdot 2^2) \approx 17,46 \\ D_n &= \overline{X^2} - (\overline{X})^2 = 19,83 - 19,27 = 0,56 \\ D_m &= \overline{Y^2} - (\overline{Y})^2 = 17,46 - 16,64 = 0,82, \\ D_n &< D_m, \\ \chi^2 &= \frac{1}{n_1 n_2} \sum_{j=1}^4 \frac{(n_{1j} n_2 - n_{2j} n_1)^2}{n_{1j} + n_{2j}} \\ &= \frac{1}{100 \cdot 100} \left(\frac{(47 \cdot 100 - 39 \cdot 100)^2}{90} + \frac{(47 \cdot 100 - 36 \cdot 100)^2}{130} + \frac{(4 \cdot 100 - 19 \cdot 100)^2}{23} + \frac{(2 \cdot 100 - 6 \cdot 150)^2}{8} \right) = 13,98 \\ \chi^2_{exp} &= 13,98 > \chi^2_{cont} = 7,815 \end{split}$$

The reliability of the result was also confirmed in Criterion χ^2 .

So, with the value level of the Experimental Group $\alpha = 0.05$, it can be said that the average of the experimental group is higher than the average of the control group

After the experiment, the variation series of the results of the evaluation of boys in the experiment and control group for samples 1 and 2 of the Pearson distribution is as follows (Table 7):

Table 7. A	fter the	experiment,	the results	of the	assessment	of bo	vs in tł	ne exp	erimental	and	control	group	ρ
		1 /					2	1				0 1	

	Sample 1										
Experimen	Xi	5 (very	4 (good)	3 (satisfactory)	2	Total average					
tal group		good)			(unsatisfactor	y)					
	ni	44	36	14	6	n = 100					
				Sample 2							
Control	uj	5	4	3	2	Total average					
group	mj	34	40	19	7	m = 100					

Activating the Cognitive Process of Schoolchildren Through a Gender-Based Approach to Learning

$$\bar{X} = \frac{1}{n} \sum_{i=1}^{4} n_i x_i = \frac{1}{100} (44 \cdot 5 + 36 \cdot 4 + 14 \cdot 3 + 6 \cdot 2) \approx 4,18$$
$$\bar{Y} = \frac{1}{m} \sum_{j=1}^{4} m_j y_j = \frac{1}{100} (34 \cdot 5 + 40 \cdot 4 + 19 \cdot 3 + 7.2) \approx 4,01$$

Now we calculate the dispersions for both groups: It can be seen that in the experimental group, the average acquisition is higher than in the control group, i.e. $\overline{X} > \overline{Y}$.

Now we calculate the dispersions for both groups:

$$\begin{split} \overline{X^2} &= \frac{1}{n} \sum_{i=1}^4 n_i x_i^2 = \frac{1}{100} (44 \cdot 5^2 + 36 \cdot 4^2 + 14 \cdot 3^2 + 6 \cdot 2^2) \approx 18,26 \\ \overline{Y^2} &= \frac{1}{m} \sum_{j=1}^4 m_j y_j^2 = \frac{1}{100} (34 \cdot 5^2 + 40 \cdot 4^2 + 19 \cdot 3^2 + 7 \cdot 2^2) \approx 16,89 \\ D_n &= \overline{X^2} - (\overline{X})^2 = 18,26 - 17,47 = 0,79 \\ D_m &= \overline{Y^2} - (\overline{Y})^2 = 16,89 - 16,08 = 0,81, \\ D_n &< D_m, \\ \chi^2 &= \frac{1}{n_1 n_2} \sum_{j=1}^4 \frac{(n_{1j} n_2 - n_{2j} n_1)^2}{n_{1j} + n_{2j}} \\ &= \frac{1}{100 \cdot 100} \left(\frac{(44 \cdot 179 - 34 \cdot 100)^2}{78} + \frac{(36 \cdot 100 - 40 \cdot 100)^2}{76} + \frac{(14 \cdot 100 - 19 \cdot 100)^2}{33} + \frac{(6 \cdot 100 - 7 \cdot 100)^2}{13} \right) = 9,327 \\ \chi^2_{exp} &= 9,327 > \chi^2_{cont} = 7,815. \end{split}$$

The results of experimental and test work carried out by the preschool educational organization in order to determine the effectiveness of the technology for organizing educational activities of older children on the basis of a gender approach were analyzed mathematically and statistically using the χ^2 . Pearson distribution criterion and theoretically confirmed the reliability of the results obtained.

Discussions. Gender equality implies the provision of equality of rights to education and professional activities, regardless of gender. Gender equality of women and men means that they have equal power for financial independence, education and personal development. The term is a social aspect of the relationship between men and women, girls and boys that manifests itself in all areas of society's life and activities.

The Gender trait is associated with the physiological and socio-psychological self-esteem of the individual and is reflected in the functioning of its emotional-volitional processes, mechanisms of perception and systems of thinking, attention and memory.

The "gender approach to education" is understood as a methodological orientation of a teacher towards educational activities. It is aimed at the organization of the appropriate stage in the development of an individual's unique personality by helping students to break free from gender stereotypes that may

limit them in their educational process. This approach recognizes the equality of all students' social status and takes into account their gender characteristics, thinking strategies, and mechanisms of information perception and assimilation.

Organization of educational activities based on a gender approach:

- creates favorable conditions for the orientation of the educational process towards the personality of pupils, increasing cognitive activity and forming in them a value-significant gender development of personality, the right direction of mental and mental development, strengthening mental health and supporting their individuality;
- 2) when ensuring gender equality in the organization of the educational process and the regulation of social relations, it has a positive effect on the consistent formation of students' skills of observation, design, hypothesizing, imagination and creativity.

The main focus in the activities organized on the basis of the Gender approach should be on strengthening educational topics with the help of at least two variations, carrying, synthesizing and games, taking into account the gender peculiarities of children.

The training materials in the first variant are prepared for children with a left hemisphere leader, audial modalliru dominant. Girls make up the majority of children in this category.

The second variant material is intended for children with a dominant right hemisphere and, primarily, relatively light perception of visual as well as discert modality information. Most of the children in this category were made up of boys.

At the beginning of the pilot study, the acquisition of knowledge, skills and competencies in mathematics in girls in the pilot group accounted for 75% before the experiment (71% in the control group), and 74% in boys (75% in the control group). At the end of the experiment, it was found that the mathematical knowledge, skills and qualifications of girls changed by 92% (82% in control groups), and in boys by 94% (80% in control groups).

The above results suggested from our side that the approach helped preschool-adult girls gain mathematical knowledge, skills and qualifications by 17% (11% in control groups), and boys 'knowledge by 20% (5% in control groups).

The results of experimental test work carried out by the preschool educational organization in order to determine the effectiveness of the organization of educational activities of older children on the basis of a gender approach were analyzed mathematically-statistically using the χ^2 Pearson distribution criterion.

Using Pearson's criterion distribution χ^2 ,

$$\chi^{2} = n_{1}n_{2}\sum_{j=1}^{m} \frac{1}{n_{1j} + n_{2j}} \left(\frac{n_{1j}}{n_{1}} - \frac{n_{2j}}{n_{2}}\right)^{2} = \frac{1}{n_{1}n_{2}}\sum_{j=1}^{m} \frac{\left(n_{1j}n_{2} - n_{2j}n_{1}\right)^{2}}{n_{1j} + n_{2j}}.$$

Separating the subjects into an experimental and control group, it can be explained that the obtained statistical results are equivalent to the value $\chi^2_{\rm kp} = 7,815$, a critical value corresponding to the degree of freedom k = n - 1 and the value $\alpha = 0.05$ based on the criterion χ^2 , confirming the reliability of the result to the criterion χ^2 .

This analysis theoretically confirmed that the results obtained in the experimental process of the model of organizing educational activities of children on the basis of a gender approach are reliable.

Conclusion

We have come to the following conclusions based on the results of research based on the organization of educational activities based on the gender approach of preschoolers:

- 1. The Gender approach is to direct the content of the activity to the individual, to increase cognitive activity, to properly guide the personality through the development of a valuable-meaningful gender and the promotion of gender equality, to strengthen mental health, support individuality and regulate social relations.
- 2. The gender approach to educational activities is a methodological orientation of the educator to educational activities, which, taking into account the specifics in the mechanisms of gender, thinking strategies, acceptance and assimilation of information of those brought up at the appropriate stage of activity, helps children develop an unrepeatable individuality by softening gender differences and freeing the educational process from gender stereotypes that limit them.
- 3. The model of the organization of educational activities of preschool adults on the basis of a gender approach is made up of targeted, meaningful-process and evaluative-mezzanine blocks.
- 4. To organize educational activities on the basis of a Gender approach, it begins with the diagnosis of the individuality of the learner, specific gender characteristics: thinking strategies, specificities in the mechanisms of receiving and assimilating information.
- 5. In the organization of educational activities on the basis of the Gender approach, it is advisable to use techniques such as classified narrative, communication, polymodal training, perceptual map, infographics and game, as well as individual and collective forms of training such as development (development of mental abilities), round tables (hearing, perception, thinking, critical thinking), discussion and discussion (development of the ability to find solutions to problems).
- 6. The effectiveness of the organization of educational activities on the basis of a Gender approach largely depends on the targeted preparation of scientific and methodological and didactic tools, which, in addition to the gender characteristics of the educators, also reflects the areas and needs of interest.
- 7. The results of the experiment and their mathematical and statistical analysis on the basis of a gender approach, the organization of educational activities has a positive effect on the orientation of education to the personality and individuality of educators and, as a result, increasing their cognitive activity, correctly directing their mental development, supporting their individuality and regulating their social relations.

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