

CHARACTERISTICS OF THE ABILITY TO ACT "IN THE MIND" OF FIRST-GRADERS

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Abstract. *The article is devoted to the presentation of a study aimed at describing the characteristics of the ability to act "in the mind" in children at the very beginning of schooling. Based on the material of two methods built on the principle of tasks "Labyrinths with rules", seven groups of children were identified according to the level of formation of the ability to act "in the mind".*

Keywords: *first-graders, mental actions, variants of tasks "Labyrinths with rules".*

1. Introduction. Achieving goals that allow preventing educational failure and school maladaptation in the primary grades, as well as helping to identify those children who are ahead of their peers in the development of intelligence, requires a diagnosis of the mental development of children 6-7 years old before enrolling in the first grade or at the very beginning of education. Voluntary regulation of behavior and the ability to act "in the mind" are often singled out as important subjects of this diagnosis.

Considering voluntariness, it should be noted that, as studies in developmental psychology have shown (see, for example, [2]), the level of voluntary regulation by a child of his behavior increases as he accumulates experience of successful participation in games with rules, where he is forced to control himself, focusing on the limitations of their actions prescribed by the proposed requirements.

A high level of arbitrariness manifests itself in a child in different aspects: in a decrease in the number of impulsive reactions and an increase in the length of time during which an insufficiently interesting task is performed; in managing the child with their attention when working with a sample; in the conscious subordination of their actions to the rule and given requirements; in controlling their behavior at the time of receiving tasks, as well as in the process of their implementation and after completion of work; in composure and focus on solving the problem to keep attention on the desired and resist the effects

of distracting circumstances; in the complete assimilation of the rule that allows and prohibits certain actions, and the exact application of it in the performance of the task.

In developmental psychology (see, for example, [2]), when characterizing the ability to act "in the mind", it is usually indicated that it manifests itself in the ability of children to operate with substitutes for specific material objects (images, diagrams, symbols), and perform actions with them not in external, objectified form, but in the internal, subjective.

In preschool childhood, the child, thanks to the development of different types of games, from role-playing games to games with rules, gradually moves from performing external, real actions with real objects, first to internal, mental actions with visual support for real objects and their images, and then proceeds to mental actions with images of objects and speech symbols denoting them without visual support. Thus, with age in children, external actions with real objects are joined by internal actions with their substitutes.

It should be noted that the ability to act "in the mind" is an important condition for the child's self-control when performing a task, when building an image of a goal and retaining it. This ability is a necessary basis for mastering a new rule for solving problems and its use, orientation in the conditions of problems and considering different options for the sequence of actions when planning the course of solving problems.

Thus, the ability to act "in the mind", as its brief examination shows, is a necessary con-

dition for voluntary behavior and, consequently, for successful schooling, where the child needs to control himself, his activities and his mental processes, not only with the independent assimilation of new knowledge, but also in joint work with other children, which complicates the achievement of the required result.

In general, the ability to act "in the mind", as shown by the studies of Ya.A. Ponomarev [7], V.V. Davydov [1] and ours [4], is a necessary condition for successful education in elementary school.

2. Materials and methods

To diagnose the level of formation in preschoolers of voluntary regulation of behavior and the ability to act "in the mind", the "Butterfly Flights" technique was developed on the basis of labyrinth tasks "with rules" (for examples of such tasks, see [6]). Successful assimilation of new rules and their use for solving the problems of the named methodology presupposes that children have the opportunity to consciously control their actions and effectively operate with the images of objects

(and not the objects themselves) when solving these problems, i.e. implies that they have the ability to act "in the mind".

2.1. Conducting a lesson on the material of the playing field with graphic images

1. A square of 25 cells is depicted on a sheet of paper, into which graphic images are placed, for example, one cross, two crosses, one stick, two sticks, two ovals, one square, two squares, etc. (see Fig. 1).

2. Together with the child, the images in each cell of the playing field are sequentially called, starting from the top line (from left to right): one cross, two crosses, one stick, two sticks, two ovals, one square, two squares, one flag, two flags, one oval, one dot, two dots, one circle, two circles, one arrow, one triangle, two triangles, one hook, two hooks, two arrows, number 1, number 2, letter M, letter A, clock.

3. The child is told the rule of flight of the "butterfly" through the cells of the square: "Let's agree that a butterfly flies according to this alphabet. She can only fly through the cage."

+	+ +			○	○
□	□ □	∩	∩ ∩	○	○
●	● ●	○	○ ○	→	→
△	△ △	∩	∩ ∩	→	→
1	2	M	A	⌚	

Fig.1. Playing field

. The child is offered tasks with one flight: "A butterfly sits in a cage with two dots. From there, she can fly only two crosses, two sticks, two circles, the letter "A" and the number "2". And she can't fly to any other cell. Do you understand? ... Now tell me, what kind of flights can a butterfly make from a cage where there is one arrow?"

5. After the child's answers, he is offered a training task: "Guess what two flights a butterfly can make from a cage, where there is one cross, into a cage, where there are two ovals?"

6. After the child's answer, he is offered to solve eight main tasks:

1) What 2 flights did the butterfly make from one triangle to two arrows?

2) What 2 flights did the butterfly make from one square to one oval?

3) What 2 flights did the butterfly make from two crosses to the letter A?

4) What 2 flights did the butterfly make from the letter M to two ovals?

5) What 3 flights did the butterfly make from one triangle to one oval?

6) What 3 flights did the butterfly make from the number 1 to one circle?

7) What 4 flights did the butterfly make from the number 1 to one cross?

8) What 4 flights did the butterfly make from one arrow to one point?

7. When evaluating solutions proposed by children, one should (as in evaluating solutions to problems on the material of a split alphabet) keep in mind that there are several options for correct answers: in tasks 1 - 4 - two options each, in tasks 5 - 8 - each four options.

2.2. Conducting a lesson on the material of the playing field with graphic images according to the rules for moving the imaginary character "Rooster"

1. For a lesson with a child, you will need the same playing field as for solving problems on the material of the playing field with graphic images (see Fig. 1).

2. Together with the child, the images in each cell of the square playing field are named sequentially, starting from the top line (from left to right).

3. The child is told the rule for moving the rooster: "A magic rooster walks through these cells. He takes different steps: one step directly into the next cell, for example, from one square to two squares, or to a cross, or to a dot; another step obliquely, for example, from one arrow to two flags or to two hooks. The rooster changes steps all the time: either straight or oblique. He does not jump, but only walks and does not enter the same cell twice.

Watch how he walks. For example, at first he was in a cell with one dot, then he went to where there were two dots, then diagonally to one flag, then straight to two flags, then diagonally to one arrow, then straight to two arrows, then diagonally to the letter A, then straight to the letter M ...".

It should be noted that it is desirable either in this place or in another (earlier or later) to include the child in the description of the movements of the "cock" in the cells of the square: indicating the type of step ("straight", "oblique") and the name of the cell where the rooster falls. The child can be offered: "... and now tell yourself how far the rooster could walk, what steps he took and into which cages ...".

Such inclusion of the child is necessary to make sure that he has learned the individual steps of the rooster and the rule of his movements: the sequence of straight and oblique steps, the absence of jumps

4. After the "rooster's journey" across the playing field, the child is offered a training task: "Tell me, what two steps can a rooster take to get from a cage where there are two squares to get into a cage where there are two circles?" With any answer of the child, he is offered to say how else a rooster can get from one cage to another.

5. The child is offered to solve eight main tasks:

1) What 2 steps did the rooster take from one cross to one flag?

2) What 2 steps did the rooster take from two flags to two arrows?

3) What 2 steps did the rooster take from the number "2" to two triangles?

4) What 2 steps did the rooster take from two points to one circle?

5) What 3 steps did the rooster take from the letter "M" to two triangles?

6) What 3 steps did the rooster take from one circle to one flag?

7) What 4 steps did the cock take from one triangle to one hook?

8) What 4 steps did the rooster take from two sticks to one oval?

When evaluating the solutions proposed by the children, one should (as in evaluating the solutions to the problems of the "Butterfly Flights" method) keep in mind that there are several options for correct answers: in tasks 1 and 2 - two options, in tasks 3 - 8 - four options.

2.3. Features of a diagnostic session with a child

It is advisable to carry out individual diagnostics of children in order to determine their intellectual and volitional readiness for schooling in April-May.

At the same time, the same diagnostics can be carried out later (in August or even in September) in order to inform the teacher about the child's ability to master the first grade program material.

In any case, it is advisable to offer children to solve labyrinth problems "with rules", where it is required to move imaginary characters in accordance with certain requirements.

It should be borne in mind that for a more accurate and specific assessment of the degree of readiness of the child to study at school, it makes sense to conduct two diagnostic sessions with the child (one method per session).

It should also be noted that, according to the conditions of the problems of these methods, one can get from one point of the playing field to another in a different number of actions (flights or steps). If a child notices such a feature, indicating that the problem can be solved in fewer actions than required (and he himself can show such a solution), then this indicates a good development of the ability to act "in the mind." At the same time, he should nevertheless answer that the game consists in being able to solve the problem in both a smaller and a larger number of actions.

Many problems with the movement of marked characters have several solutions for the same number of actions. When solving problems, as could be observed, some children can indicate all possible options, others - part of the options, and still others - only one option.

To find out, the child can be asked: "How else can you get to the right cell in two flights (two steps)?" It is clear that the more options a child finds, the better his ability to act "in his mind" is developed.

When children solve problems, it is also necessary to pay special attention to the fact that the child acts only verbally, i.e. only by naming the cells of the playing field along which the imaginary character moves - "Butterfly" or "Rooster".

If a child is not able to solve problems in speech form and needs to use his hands to find a solution (either only in the air above the playing field, indicating the general direction of movement, or by moving his hand directly across the paper where the playing field is drawn), then this the fact indicates that the child is not intellectually ready enough to study at school.

3. Results

49 people (two classes of first graders) participated in the individual experiments of the study, conducted at the beginning of the academic year.

According to the peculiarities of solving the problems of the "Butterfly Flights" and "Rooster Steps" methods, seven groups of children were identified.

The first group consisted of children who could not master the rule of moving an imaginary character ("butterfly" or "rooster"). It is important to note that they could not master the rule not only when showing a single movement in verbal form, but even using object manipulations, if they were allowed to move a finger or a pencil across the cells of the playing field.

The second group consisted of children who were unable to master the rule of moving an imaginary character ("butterfly" or "rooster") without actions in the object form. This was manifested in the fact that they could not verbally correctly answer the question:

“Where can you get in one flight (one step)?”. In other words, they could not perform one action according to the proposed rule from a given point on the playing field, operating only with images, i.e. just looking at the playing field.

At the same time, it is important to note that they could still do this, but only in those cases if, firstly, they were given the initial cell of one movement (flight or step) or allowed to find it on their own by moving a finger (or a pencil, but without drawing lines) on the playing field and, secondly, to offer after that to show, by moving a finger or a pencil on the playing field, what movements are possible subject to the proposed rule.

The third group consisted of children who did not cope with the training task, i.e. with a two-action task (two flights or two steps), although, unlike the first group, they mastered the rule and successfully completed the one-action task (“Where can you get in one flight?”) in verbal form.

The fourth group consisted of children who could not cope with the main tasks in two actions (Nos. 1 - 4), although, unlike the children of the third group, they successfully solved the training problem.

The fifth group consisted of children who could solve the main tasks in two actions (Nos. 1 - 4), but did not cope with the main tasks in three actions (Nos. 5 - 6).

The sixth group consisted of children who could not cope with tasks in four actions (Nos. 7 and 8), although they successfully solved problems in two and three actions, – Nos. 1 - 6.

The seventh group consisted of children who correctly solved all the main tasks – Nos. 1 - 8.

The table below presents data reflecting the success of first-graders in determining the degree of formation of the ability to act “in the mind” at the beginning of the school year.

Table. The results of solving the problems of the “Butterfly Flights” and “Rooster Steps” methods by 1st grade students in September.

Groups	“Butterfly Flights”	“Rooster Steps”
First	2 (4,1%)	1 (2,0%)
Second	4 (8,2%)	2 (4,1%)
Third	5 (10,2%)	4 (8,2%)
Fourth	10 (20,4%)	8 (16,4%)
Fifth	21 (42,9%)	22 (44,8%)
Sixth	5 (10,2%)	7 (14,3%)
Seventh	2 (4,1%)	4 (8,2%)

The data presented in the table allow us to note the following.

Firstly, when solving problems using each method, the largest number of children were in the fourth and fifth groups: according to the “Butterfly Flights” method, respectively, 20.4% and 42.9% (i.e., in total – 63.3%), according to the “Rooster Steps” method – 16.4% and 44.8% (i.e. in total – 61.2%. These data indicate that the majority of children coped with the tasks of both methods in two steps.

At the same time, it is important to note that, according to both methods, the fifth group consisted of almost half of the children: 42.9% coped with the main tasks of the “Butterfly Flight” method and 44.8% with the main tasks of the “Rooster Steps” method.

This indicates that among the noted majority of children, in turn, most of the children coped with the four main tasks.

In general, the noted facts allow us to state that the majority of children are ready to study in primary school.

Secondly, it is worrying that a significant part of the children: according to the results of solving the problems of the “Butterfly Flights” methodology, this is 22.5%, and according to the methodology, the results of solving the problems of the “Rooster Steps” methodology, this is 14.3%, did not cope with tasks in two steps.

It should be noted that of them, in the first case, only 10.2% could perform only one action (one flight of a butterfly), and in the second case, where one action consists in one

step of a rooster, there were only 8.2% such children.

And the most important thing that we managed to establish is that in the first case (when solving the "Butterfly Flights" tasks), 12.3% (i.e. children who make up the first and second groups) could not perform one action "in their mind", and in the second case – 6.1%).

As the practice of long-term surveys has shown, the children who made up the first, second and third groups, usually when studying in the first grade, poorly, according to teachers, mastered the program material, especially in those cases when it is required to understand and apply the rules of mathematics and grammar.

At the same time, it should be noted that the children who made up the fourth and fifth groups (i.e., those who solved problems in two actions) usually studied for fours, and the children who made up the sixth and seventh groups (i.e. those who solved problems in three and four steps).

It is interesting to note that, according to the results of solving the problems of the "Butterfly Flights" methodology, there are fewer children in the last two groups (sixth and seventh) than children in the first three groups, respectively, by 14.3%. and 22.5%, and according to the results of solving the problems of the "Rooster Steps" methodology, the picture is different: there are more children of the last two groups (sixth and seventh) than children of the first three groups, 22.5% and 14.3%, respectively.

This fact indicates that the tasks of the "Rooster Steps" method are somewhat easier than the tasks of the "Butterfly Flights" method. Therefore, it is advisable to diagnose the formation in children of the ability to act "in

the mind" not by one of these methods, but by both methods.

It is important to note, regarding the procedure for conducting a diagnostic session with a child, that when working with timid and shy children, in order to instill confidence in them, they should be offered to solve the "Caterpillar" problems, or before solving the problems of the main technique, in order to remove excess from them. tension and stiffness, or after solving the problems of the main technique, to calm them and cheer them up.

In such tasks, (you can make any movements on the playing field, since the "Caterpillar" can crawl in any direction (such is its "rule"). This provides the child with unconditional success: you only need to name the cells along which the caterpillar will crawl between the starting and ending points. After such communication, the child will leave satisfied with his actions and with pleasant impressions from an adult who acts for him as a representative of the school.

It is advisable to bring the results of diagnosing the ability to act "in the mind" to the attention of the teacher and parents. In the latter case, you need to tell how to work with the child before the start of school lessons (if the diagnosis was carried out in April - May or early August).

To increase the level of readiness, it makes sense to engage with a child on the material of various games where you need to learn and follow the rules (for example, such well-known board games as checkers, chess, dominoes are suitable).

At the same time, for regular classes on developing the ability to act "in the mind", you can use our developments [3, 5], where it is detailed and clearly stated what and how an adult should do when dealing with child.

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ХАРАКТЕРИСТИКИ СПОСОБНОСТИ ДЕЙСТВОВАТЬ «В УМЕ» У ПЕРВОКЛАССНИКОВ

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***Аннотация.** Статья посвящена изложению исследования, направленного на описание характеристики способности действовать «в уме» у детей в самом начале обучения в школе. На материале двух методик, построенных по принципу заданий «Лабиринты с правилами», выделены семь групп детей по уровню сформированности способности действовать «в уме».*

***Ключевые слова:** первоклассники, умственные действия, варианты заданий «Лабиринты с правилами».*