

FEATURES OF CREATIVE ACTIONS OF YOUNGER TEENAGERS

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Abstract. *The article discusses the content of the study, the purpose of which was to study the features of creative actions of younger adolescents, in particular fifth graders. Students were asked to solve and compose tasks related to moving an imaginary character based on certain rules on the playing field for the required number of actions. Based on individual experiments, it was shown that students use different ways of creative actions (formal, meaningful, productive, original). At the same time, the distribution of these methods among fifth-graders was established.*

Keywords: *fifth graders, tasks "on translation", the creative action of the form of action, the complexity of the task.*

1. Introduction. Actions to solve creative problems are one of the main forms of independent human mental activity. The study of the peculiarities of the formation of such actions in the conditions of school education is an important direction of scientific research of modern problems of educational psychology. At the same time, the development of characteristics of independent educational and cognitive actions of schoolchildren is an urgent psychological and pedagogical task set in the new FSES OOO [2].

The main provisions of the above document note the need for middle school students to achieve metasubject results associated with different manifestations of independent creative actions of students in the learning process.

In particular, it points to such aspects of the creative approach in the educational activity of schoolchildren as setting new tasks in cognitive activity, planning new ways to achieve the goal, consciously choosing the most effective ways to solve educational and cognitive tasks, searching for original ways of acting within the proposed conditions and requirements.

The idea of our experimental work was to investigate the methods of independent creative actions of fifth-graders when they compose new problems (similar to those solved) on the basis of material not related to academic subjects.

The aim of the study was to determine which creative ways fifth grade students use when composing problems. At the same time, the complexity of the tasks, as well as the conditions for their solution and compilation, varied. The conditions for the implementation of creative acts were the forms of action: substantively effective and visual-figurative. In the first case, it was proposed to compose tasks using actions with real objects, in the second case, composing tasks was associated with operating only with images and representations of real objects.

The hypothesis of experimental work was associated with the fact that creative actions carried out in a substantively effective form are more successful than creative actions carried out in a visual-figurative form. This assumption is based on the provisions of a number of fundamental approaches to mental development in ontogenesis, according to which effective actions in a visual-figurative form are formed at a later age than effective actions in a subject-effective form (see, for example [1], [3]).

As part of the study, four series of individual experiments were carried out in which 87 fifth-graders participated: 21 students in the first series, 20 students in the second series, 22 students in the third series, and 24 students in the fourth series.

2. Materials and research methods

The experiments involved the development of tasks based on non-educational material,

which would allow them to be solved and compose both in a substantively effective form and in a visual-figurative form. These tasks include "problems" for movement. The meaning of these problems is to find out how an imaginary character moves across the cellular playing field from one cell to another according to a certain rule for the required number of actions (for more details about tasks of this type, see in our studies, for example, [4]).

In four series of experiments with fifth-graders, such "displacement" tasks were used, in which an imaginary person – a "rooster" – alternates possible displacements – steps. One step is to move directly to an adjacent cell (vertically or horizontally). Another is to move to an adjacent square diagonally.

Thus, the rule of movement of the "rooster" in problems of this type is that it alternates a step into an adjacent square directly and a step into an adjacent square obliquely. This rule means that the "rooster" cannot make two identical steps in a row; two steps straight or two steps obliquely.

In problems with the steps of a "rooster" on a cellular playing field (Fig. 1), it is necessary to determine, for example, which three steps the "rooster" took from cell A2 to cell D4. It is clear that if you observe the above rule of alternating steps (straight and obliquely), then such a solution to this problem is possible: the first step: A2 - B3, the second: B3 - C3, the third step: C3 - D4.

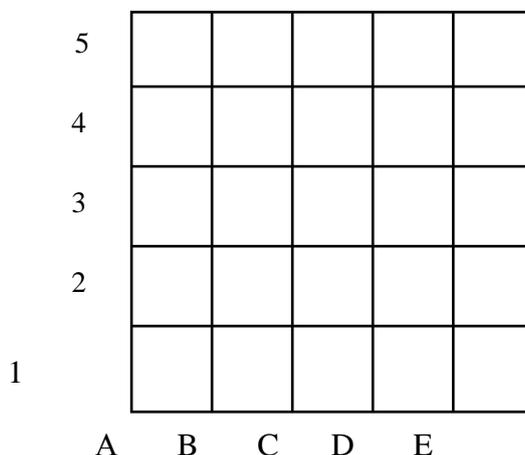


Fig. 1. Playing field

In the experiments of the first series, children were asked to solve and compose problems of this type in a subject-effective form. In this case, the role of an imaginary character ("rooster") was played by a cube that could be moved along the cells of the playing field, drawn on a separate sheet of paper (each cell was 5 cm by 5 cm).

At first, the subject was told that a "magic rooster" was walking along the cells of the playing field, which alternates steps: straight

into the next cell and askew. Then the child should show with the help of a cube how a "rooster", observing the rule of alternating steps, can get from cell A1 into cell E1.

After that, it was proposed to solve four main tasks in a row: problems №1 and №2, where it was necessary to find two steps of the "rooster" (Fig. 2 and 3), problem №3 – three steps (Fig. 4), problem №4 – four steps (fig. 5).

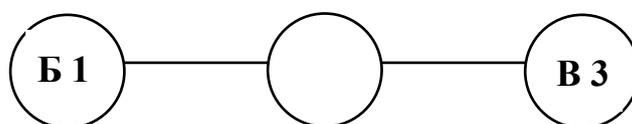


Fig. 2. Task 1 with two steps

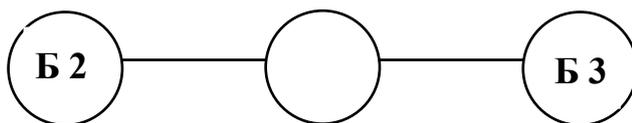


Fig. 3. Task 2 with two steps

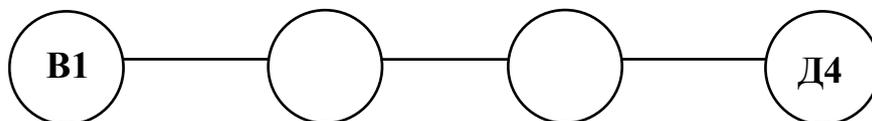


Fig. 4. Task 3 with three steps

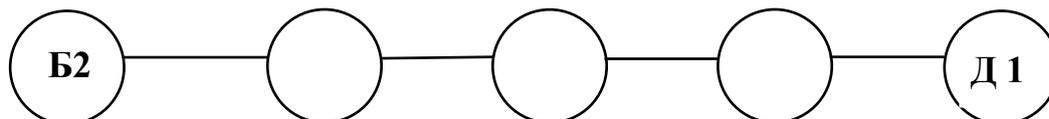


Fig. 5. Problem 4 with four steps

The subject could solve problems by moving or not moving (as he wanted) the cube on the game zero.

If the children coped with tasks of the second degree of complexity (task №3, with three steps) or third degree (task No. 4, with four steps), then they were asked to independently compose tasks of the first degree of complexity, i.e. tasks with two steps "rooster" (similar to tasks №1 and №2). To do this, they were given two cardboard circles, which they could (at will) place in the initial and final cells of the movements of the "rooster". It

was also suggested to use a cube when composing problems.

In response to the offer to "come up with problems," the students acted in different ways. Four groups were identified according to the method of performing creative actions. The first group of students performed creative actions formally. This was manifested in the fact that they composed problems that could not be solved by performing two steps, since it was required to make three steps of the "rooster" (Fig. 6, – the initial cell A1 and the final one – A3) or four steps (Fig. 7, – initial cell B2 and final cell D3):

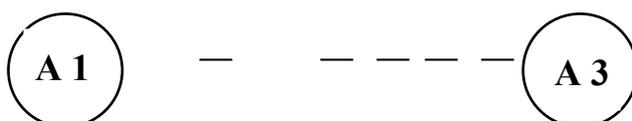


Fig. 6. Problem with three steps

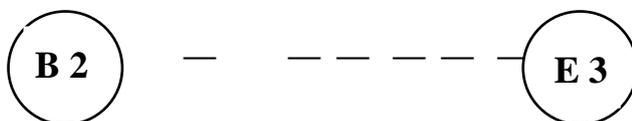


Fig. 7. Problem with four steps

When composing such problems, the children, as it was possible to observe, did not solve them themselves, but simply first put one circle in the initial cell (for example, in A1), and the second circle in the final cell (for example, A3) and reported that the problem was ready.

Pupils in the second group performed meaningful creative actions, since they com-

posed the tasks of the first degree of complexity (with two steps of the "rooster").

Their actions were different from those of those children who used the formal method when composing problems. The pupils of the second group acted as follows. First, one of the cardboard circles was placed in some kind of cage. Then a cube was used - it was moved from the initial cell (occupied by a circle) to a

free one (this is the first step of the "rooster"). Then, according to the rule of alternation, the second step was done (not the same as the first). And in the cell where the cube fell after the second move, the second cardboard circle was placed.

Performing creative actions in this way, the pupils of the second group composed one or two tasks of the first degree of complexity.

The pupils of the third group performed creative actions productively, since they composed several (three to five) problems,

built according to a single scheme, i.e. such problems, where the "rooster" took the same steps, - this could be judged by observing how these children moved the cube, composing problems. In particular, if in the first task there was first a step obliquely, and then a straight step, then in the other tasks exactly the same steps were performed (i.e. obliquely and straight). In addition, the distance from the initial cell to the final one in all problems was also the same (see Fig. 8, 9 and 10):

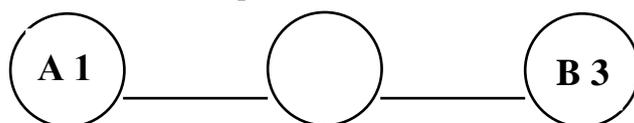


Fig. 8. Condition of the first problem



Fig. 9. Condition of the second problem

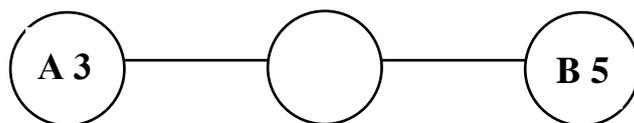


Fig. 10. Condition of the third problem

Interesting, the subjects of the third group composed the first task in the same way as the subjects of the second group, and already the second and third tasks (and sometimes the fourth and fifth) were obtained simply by moving the circles denoting the starting and ending cells up one cell. In other cases, problems similar to the first were obtained by

shifting the circles one cell to the side: to the right or to the left.

The pupils of the fourth group performed creative actions in an original way, since they composed several (three to five) tasks built (in contrast to the tasks composed by pupils of the third group) according to different schemes (see, for example, the first three tasks in Figs. 11, 12 and 13):

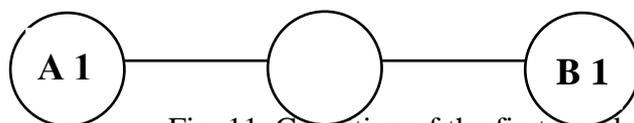


Fig. 11. Condition of the first problem

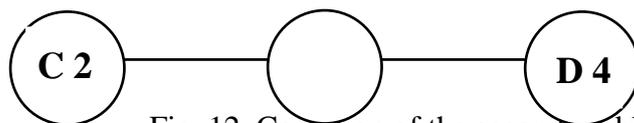


Fig. 12. Condition of the second problem

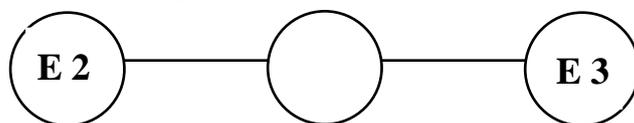


Fig. 13. Condition of the third problem

As you can see, the specific steps of the "rooster" when composing each problem were different. So, in the first problem (Fig. 11), first a step was made obliquely, and then a step was made straight, ie first moving along cells A1 - B2, then along cells B2 - B1.

In the second task (Fig. 12), the initial and final cells of the "rooster's" movements were located at the maximum distance from each other (and not in neighboring cells, as in the first task). At the same time, at first, a step was made directly: C2 - C3, and then an oblique step: C3 - D4. In the third problem (Fig. 13) between the starting and ending cells again (as in the first problem) there was a minimum distance (the starting and ending cells were adjacent: E2 and E3). But, in contrast to the first task, here the alternation of steps was different — at first there was a straight step: E2 - D2, and then the step obliquely: D2 - E3.

In the experiments of the second series, the children solved four main problems (just as in the first series) in an subject-effective form. At the same time, in contrast to the first series, the composition of the problems was offered only to those schoolchildren who coped with the solution of the problem of the third degree of complexity – with four steps of the "rooster". These schoolchildren were asked to compose problems of the second degree of complexity, - with three steps of the "rooster".

As in the first series, four groups of schoolchildren were identified. The first group performed creative actions in a formal way, composing problems that cannot be solved with the help of three movements of the "rooster" – for example, some schoolchildren proposed the following problem (Fig. 14):



Fig. 14. Condition of the problem in the formal way of writing

The second group of schoolchildren performed creative actions in a meaningful way, since they offered one or two tasks that can be solved using three movements of the "rooster" (see, for example, the task in Fig. 15):

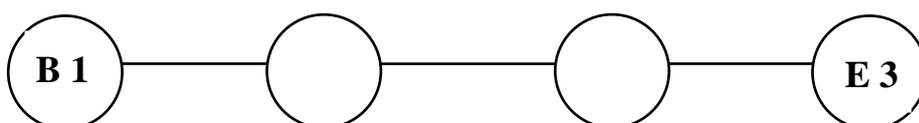


Fig. 15. Condition of the problem with a meaningful way of writing

The third group of schoolchildren performed creative actions in a productive way, since they composed three to five tasks, built according to the same scheme (see, for example, Fig. 16):

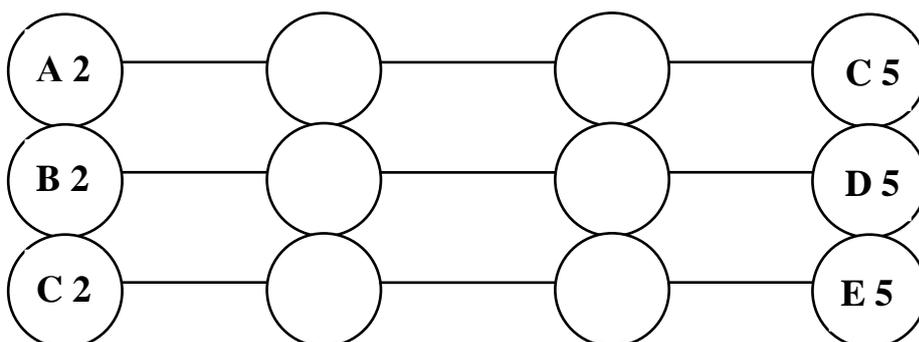


Fig. 16. Problem conditions for a productive way of writing

The fourth group of schoolchildren performed creative actions in an original way, since they composed three to five tasks built according to different schemes (see, for example, three tasks in Fig. 17):

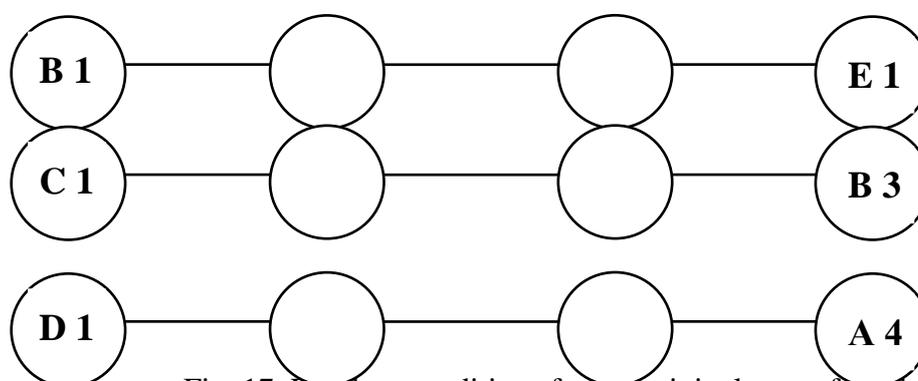


Fig. 17. Problem conditions for the original way of writing

In the experiments of the third series (in contrast to what took place in the first two series), it was proposed to solve problems in a visual-figurative form, since when solving problems it was not allowed to use the movement of the cube on the playing field, and when composing problems it was impossible to place cardboard circles in the initial and final cells of the "rooster" movement.

So that schoolchildren could solve problems in a visual-figurative form (i.e., only imagining possible movements), it was proposed to master the notation of the playing field, i.e. it was required to learn the names of the cells of the playing field, which are obtained by combining letters and numbers - for example, corner cells are called like this: A1, A5, E5, E1.

After the students mastered the names of the cells, they were asked to solve the main four problems, the conditions of which were given in writing, as in Fig. 12-15. Those who were able to correctly solve problems with three or four movements of the rooster were asked to compose problems with two movements, i.e. tasks of the first degree of complexity.

It should be noted that the solution of the main tasks was carried out orally: the subject named the cells through which the "rooster" had to pass from the initial cell to the final one. At the same time, it was impossible to touch the playing field with anything.

After solving each main problem, the cells found, along which the "rooster" moved, were

recorded on a special form, where the conditions of the four main problems were interfered: the subject entered the names of intermediate cells in free circles.

It was also suggested to compose problems orally (without touching the playing field). The subjects were asked to write down the invented problems independently, indicating only the initial and final cells, and the intermediate cell should be left unknown, i.e. it was necessary to leave one free circle between two busy ones. In other words, the invented tasks had to be presented in the same form as the first two main tasks.

When composing problems in the third series, four groups of schoolchildren were identified in the same way as in the previous series.

The first group performed creative actions in a formal way, composing problems that cannot be solved with the help of two movements of the rooster. The students of this group first wrote down the name of the initial cell, usually in the leftmost circle (of the three circles that make up the record of the condition of the problem). Then they wrote down the name of another cell (usually located at some distance from the first cell) in the far right circle. In this case, the intermediate circle remained unfilled and, as one could see, the content of this circle was unknown to the "author" himself.

When a student was asked which cell should be recorded in a free circle, he answered incorrectly. If the experimenter pro-

posed to write down the name of a knowingly wrong cell in a free circle, the subject usually agreed. All these facts characterize the formality of this method of performing creative actions when composing tasks.

The second group of schoolchildren performed creative actions in a meaningful way: first, it was established which cell would be the initial one, and its name was written in the leftmost circle. Then, looking at the playing field, two steps were outlined (sometimes it happened aloud). Then the final cell of displacements was determined and its name was written in the rightmost circle.

The third group of schoolchildren performed creative actions in a productive way, since they composed three to five problems, built according to the same scheme (see, for example, Fig. 16). The fourth group of schoolchildren performed creative actions in an original way, since they composed three to five problems built according to different schemes (see, for example, Fig. 17).

Table. Students who used formal, meaningful, productive and original ways of creative actions when writing problems in the first, second, third and fourth series of experiments (in %)

| The ways creative action | Series of experiments | | | |
|--------------------------|-----------------------|--------|--------|--------|
| | First | Second | Third | Fourth |
| Formal | 14,3** | 25,0* | 45,5** | 54,2* |
| Meaningful | 38,1 | 35,0 | 31,8 | 29,1 |
| Productive | 33,3 | 30,0 | 18,2 | 12,5 |
| Original | 14,3 | 10,0 | 4,5 | 4,2 |

Note: * $p < 0,05$; ** $p < 0,01$.

Consideration of the results of four series of experiments presented in the table gives grounds to determine the connection between the methods of creative actions (formal, meaningful, productive and original) with the complexity of the tasks proposed by children and the conditions for their composition.

3.1. Groups of students.

For a more accurate correlation of the data in the table, it is necessary to recall the characteristics of groups of students using different methods of creative actions.

In the experiments of the fourth series, the main problems were solved in a visual-figurative form. However, only those children were allowed to compose problems (in contrast to what was in the third series) who coped with problem No. 5 (with 4 movements of the "rooster").

When composing tasks, which, as in the third series, should have been performed only in a visual-figurative form, the same four groups of schoolchildren were singled out as before: the first group performed creative actions in a formal way, the second in a meaningful way, and the third in a productive way. method, the fourth - in an original way (see, respectively, Fig. 14, 15, 16, 17).

3. Research results

The data obtained as a result of the study characterizes the number of children who performed creative actions when composing tasks using meaningful, productive and original ways.

First, the students – those who wrote problems that have no solution, or problems that have several solutions, or problems that the students themselves did not know how to solve – are characterized as using a formal method of creative action.

Secondly, the students, who have composed one or two problems that have a solution and the students know this solution, are characterized as using a meaningful way of creative actions.

Thirdly, the students, who have composed three to five problems that have a solution

(while the problems are built according to the same scheme), are characterized as using a productive method of creative action.

Fourthly, the students, who have composed three to five problems that have solutions (but the problems are built according to different schemes), are characterized as using the original method of creative actions.

3.2. The relationship between the ways of creative actions and the complexity of tasks.

Determining the nature of the relationship between these methods of creative actions with the complexity of the tasks being composed presupposes the correlation of data indicating the effective composition of tasks of varying complexity – the first and the second. To do this, you need to compare the success of creative actions performed in a meaningful way, firstly, in experiments 1 and 2 of series, secondly, in experiments 3 and 4 of series, and, thirdly, in experiments 1 and 3 of series together (first degree the complexity of the problems being composed) in relation to experiments 2 and 4 of series (the second degree of complexity of the problems being composed). Further, according to the same (three-stage) scheme, it is supposed to compare the relationship between the success of the tasks being composed with the productive and original ways of creative actions.

The share of schoolchildren who use a formal way of creative actions in the first series, among all the students who wrote tasks in this series, is equal to 14.3%.

The share of schoolchildren who use a formal way of creative actions in the second series – among all students who wrote tasks in this series – is equal to 25.0% (the difference in the indicated shares, – 14.3% and 25.0%, is statistically insignificant).

The noted data mean that the effectiveness of a formal way of composing problems in a substantively effective form is not associated with an increase in the complexity of the problems being composed (from the first to the second series).

The share of schoolchildren who use a formal way of creative actions in the third series, among all the students who wrote tasks in this series, is equal to 45.5%. The share of schoolchildren who use a formal way of creative actions in the fourth series – among all

students who wrote tasks this series – is 54.2% (the difference in the indicated shares, 45.5% and 54.2%, is statistically insignificant).

The noted data mean that the effectiveness of the formal method of composing problems in a visual-figurative form is not associated with an increase in the complexity of the problems being composed (from the third to the fourth series).

Thus, the considered results allow us to note that a formal way of creative actions and the complexity of the tasks being composed are not directly related.

The share of schoolchildren who use a meaningful way of creative actions in the first series – among all students who compose problems in this series – is 38.1%. The share of schoolchildren who use a meaningful way of creative actions in the second series – among all students who wrote tasks in this series – is 35.0% (the difference in the indicated shares, 38.1% and 35.0%, is statistically insignificant).

The noted data mean that the effectiveness of the meaningful way of writing tasks in a substantively effective form is not associated with an increase in the complexity of the tasks being composed (from the first to the second series). The share of schoolchildren who use a meaningful way of creative actions in the third series, among all the students who wrote tasks in this series, is 31.8%.

The share of schoolchildren who use a meaningful way of creative actions in the fourth series, among all students who wrote tasks in this series, is equal to 29.1% (the difference between the indicated shares, 31.8% and 29.1%, is statistically insignificant). The noted data mean that the effectiveness of the meaningful way of writing tasks in a visual-figurative form is not associated with an increase in the complexity of the tasks being composed (from the third to the fourth series).

Thus, the considered results allow us to note that the meaningful way of creative actions and the complexity of the tasks being composed are not directly related.

The share of schoolchildren who use a productive way of creative actions in the first series – among all students who wrote tasks in this series – is 33.3%. The share of school-

children who use a productive method of creative actions in the second series, among all students who wrote tasks in this series, is equal to 30.0% (the difference in the indicated shares, 33.3% and 30.0%, is statistically insignificant).

The share of schoolchildren who use a productive method of creative actions in the third series - among all students who wrote tasks in this series - is 18.2%. The share of schoolchildren who use a productive method of creative actions in the fourth series - among all students who wrote tasks in this series - is 12.5% (the difference in the indicated shares, 18.2% and 12.5%, is statistically insignificant).

Thus, the considered results allow us to note that the productive way of creative actions and the complexity of the tasks being composed are not directly related.

The share of schoolchildren who use the original method of creative actions in the first series - among all students who compose problems in this series - is 14.3%.

The share of schoolchildren who use the original method of creative actions in the second series - among all students who wrote tasks in this series - is equal to 10.0% (the difference in the indicated shares, - 14.3% and 10.0%, is statistically insignificant).

The share of schoolchildren who use the original method of creative actions in the third series - among all the students who wrote tasks in this series - is 4.5%. The share of schoolchildren who use the original method of creative actions in the fourth series, among all students who wrote tasks in this series, is equal to 4.2% (the difference in the indicated shares, 4.5% and 4.1%, is statistically insignificant).

Thus, the considered results allow us to note that the original method of creative actions and the complexity of the tasks being composed are not directly related.

So, the analysis performed allows us to note that all methods of performing creative actions when writing tasks to be solved - formal, meaningful, productive and original - are not related to the complexity of the tasks, since the results of composing tasks of the first and second degrees of complexity differ statistically insignificantly.

3.3. The relationship between the methods of creative actions and the conditions for writing tasks.

Determining the nature of the connection between these methods of creative actions and the conditions in which it is proposed to compose tasks involves correlating data indicating the effective composition of tasks in a substantively effective and visual-figurative form of creative actions. To do this, you need to compare the success of creative actions performed in formal, meaningful, productive and original ways according to the following plan.

First, it is necessary to compare the success of actions in experiments 1 and 3 of series (i.e., when composing tasks of the first degree of complexity, respectively, in subject-effective and visual-figurative forms). Secondly, it is necessary to compare the success of actions in experiments 2 and 4 of series (that is, when composing tasks of the second degree of complexity, respectively, in subject-effective and visual-figurative forms). Thirdly, it is necessary to compare the success of actions in experiments 1 and 2 of series together (where it was proposed to compose the first and second degrees of complexity in a subject-effective form) and in experiments 3 and 4 of series together (where it was proposed to compose tasks in a visual-figurative form).

The share of schoolchildren who use the formal method of creative actions in the first series - among all students who wrote tasks in this series - is equal to 14.3%. The share of schoolchildren who use the formal method of creative actions in the third series - among all students who wrote tasks in this series - is equal to 45.5% (the difference in the indicated shares - 14.3% and 45.5% - is statistically significant, - at $p < 0.01$).

The share of schoolchildren who use the formal method of creative actions in the second series - among all students who wrote tasks in this series - is equal to 25.0%. The share of schoolchildren who use the formal method of creative actions in the fourth series, among all students who compose problems in this series, is 54.2% (the difference in the indicated shares, - 25.0% and 54.2%, is statistically significant, - with $p < 0.05$).

The share of schoolchildren who use the formal method of creative actions in the first and second series together - among all the students who wrote tasks in these series - is 19.5%. The share of schoolchildren who use the formal method of creative actions in the third and fourth series - among all the students who wrote tasks in these series - is equal to 50.0% (the difference in the indicated shares, - 19.5% and 50.0%, is statistically significant, - at $p < 0.01$).

Thus, the considered results allow us to note that there is a direct relationship between the form in which it is proposed to compose tasks - the subject-effective (series 1 and 2) and visual-figurative (series 3 and 4) and the formal method of creative actions: the more complex the form actions in which it is proposed to compose problems, the more children use the formal way of composing problems.

The share of schoolchildren who use a meaningful way of creative actions in the first series - among all students who wrote tasks in this series - is 38.1%. The share of schoolchildren who use a meaningful way of creative actions in the third series, among all students who wrote tasks in this series, is 31.8% (the difference between the indicated shares, 38.1% and 31.8%, is statistically insignificant).

The share of schoolchildren who use a meaningful way of creative actions in the second series - among all students who wrote tasks in this series - is 35.0%. The share of schoolchildren who use a meaningful method of creative actions in the fourth series - among all students who wrote tasks in this series - is 29.1% (the difference in the indicated shares, 35.0% and 29.1%, is statistically insignificant).

The share of schoolchildren who use a meaningful way of creative actions in the first and second series together - among all students who wrote tasks in these series - is 36.6%. The share of schoolchildren who use a meaningful way of creative actions in the third and fourth series - among all students who wrote tasks in these series - is equal to 30.4% (the difference in the indicated shares, - 36.6% and 30.4%, is statistically insignificantly).

Thus, the considered results allow us to note that there is no connection between the form in which it is proposed to compose tasks - **subject-effective** (series 1 and 2) and visual-figurative (series 3 and 4), and there is no connection between the meaningful way of creative actions.

The share of schoolchildren who use a productive way of creative actions in the first series - among all students who wrote tasks in this series - is 33.3%. The share of schoolchildren who use a productive method of creative actions in the third series - among all students who wrote tasks in this series - is 18.2% (the difference in the indicated shares, 33.3% and 18.2%, is statistically insignificant).

The share of schoolchildren who use a productive method of creative actions in the second series - among all students who wrote tasks in this series - is equal to 30.0%. The share of schoolchildren who use a productive method of creative actions in the fourth series, among all students who wrote tasks in this series, is 12.5% (the difference in the indicated shares, 30.0% and 12.5%, is statistically insignificant).

The share of schoolchildren who use a productive method of creative actions in the first and second series together - among all students who wrote tasks in these series - is 31.7%. The share of schoolchildren who use a productive method of creative actions in the third and fourth series, among all students who wrote tasks in these series, is 15.2% (the difference in the indicated shares, - 31.7% and 15.2%, is statistically significant, - at $p < 0.05$).

Thus, the considered results allow us to note that there is an inverse relationship between the form in which it is proposed to compose tasks - **subject-effective** (series 1 and 2) and visual-figurative (series 3 and 4) and the productive way of creative actions: the more complex the form actions in which it is proposed to compose problems, the less children use a productive way of composing problems.

The share of schoolchildren who use the original method of creative actions in the first series - among all students who compose problems in this series - is 14.3%. The share

of schoolchildren who use the original method of creative actions in the third series - among all students who compose problems in this series - is 4.5% (the difference in the indicated shares - 14.4% and 4.5% - is statistically insignificant).

The share of schoolchildren who use the original method of creative actions in the second series - among all the students who wrote tasks in this series - is equal to 10.0%. The share of schoolchildren who use the original method of creative actions in the fourth series, among all students who wrote tasks in this series, is equal to 4.2% (the difference in the indicated shares, 10.0% and 4.2%, is statistically insignificant).

The share of schoolchildren who use the original method of creative actions in the first and second series together, among all students who compose problems in these series, is 12.2%. The share of schoolchildren who use the original method of creative actions in the third and fourth series, among all the students who wrote tasks in these series, is 4.3% (the difference in the indicated shares, 12.2% and 4.3%, is statistically insignificant).

Thus, the considered results allow us to note that there is no connection between the form in which it is proposed to compose tasks - subject-effective (series 1 and 2) and visual-figurative (series 3 and 4), and there is no connection with the original method of creative actions.

3.4. The result of the analysis of the content of the experiments.

So, the consideration of the data obtained in the study shows, first, that the effectiveness of the ways of implementing creative actions when composing unsolvable and solved problems – formal, meaningful, productive and original – is not related to the complexity of the tasks.

Second, marked the analysis has revealed that the performance of the modalities of the creative action when composing unsolvable and tasks – formal, informal, productive and original – different conditions associated with

writing tasks, in particular, with the form of the action, which is the creative activity of students. So, the success of informative and original creative ways of action does not depend on the form of the action, and the success of formal and constructive way depends on the shape of actions: in the first case is a direct correlation, in the second case – an inverse relationship.

4. Conclusion

So, the conducted research was aimed at (as noted) characterizing the methods of creative actions that fifth-graders use when composing problems.

As a result of performing four series of individual experiments, it was found that when composing tasks of different complexity and in different forms of action, four methods of creative actions are realized.

First, the formal way, which is mainly associated with the composition of unsolvable problems or problems with several solutions. Secondly, a meaningful way, which is associated with the composition of one or two correctly constructed problems. Thirdly, a productive way, which is associated with the composition of three to five correct problems, built according to the same scheme. Fourthly, the original method, which is associated with the composition of three to five correct problems, built according to different schemes.

The characteristics of the four ways of creative action highlighted in this study contain new knowledge about the creative activity of young adolescents. This knowledge broadens the understanding of developmental psychology about the characteristics and capabilities of children of a certain age in the implementation of productive thinking.

In the future, it is planned to study the characteristics of the methods of creative actions when composing tasks that are used by students of older (than in this study) classes – from the sixth grade to the ninth grade. An important task is also to study the distribution of these four ways of creative actions among these groups of students.

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ОСОБЕННОСТИ КРЕАТИВНЫХ ДЕЙСТВИЙ МЛАДШИХ ПОДРОСТКОВ

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***Аннотация.** В статье рассматривается содержание исследования, цель которого заключалась в изучении особенностей творческих действий младших подростков, в частности пятиклассников. Ученикам предлагалось решать и сочинять задачи, связанные с перемещением воображаемого персонажа на основе определенных правил по игровому полю за требуемое число действий. На основе индивидуальных экспериментов было показано, что школьники применяют разные способы творческих действий (формальный, содержательный, продуктивный, оригинальный). При этом было установлено распределение названных способов среди пятиклассников.*

***Ключевые слова:** пятиклассники, задачи «на перемещение», способы творческих действий, формы действий, сложность задач.*