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PSYCHOLOGICAL AND PEDAGOGICAL ASPECTS OF JUNIOR SCHOOLCHILDREN'S RESEARCH ACTIVITIES ORGANIZATION IN THE EDUCATIONAL PROCESS

Oksana Loiuk, Candidate of Pedagogical Sciences (Ph.D.), Docent, Associate Professor at the Professional Methods and Innovative Technologies in Primary School Department, Pavlo Tychyna Uman State Pedagogical University.
ORCID: 0000-0001-6027-0895
E-mail: lov1207@ukr.net

The article substantiates the relevance and necessity of involving junior schoolchildren in research activities. A brief research analysis on the stated problem has been carried out. The interpretation of the concepts of "activity" and "research activity" has been presented. Psychological and pedagogical aspects of junior schoolchildren's research activity organization in the learning process have been determined. These are the following: taking into account the age-specific features of the manifestation and development of search activity in children aged 6–10 years, didactic tasks of research activity, teacher's specific skills to solve research education tasks, and stages of research education organization in primary school.
Keywords: *junior schoolchildren; activity; research activity; search activity; organization of pupils' research activity; didactic tasks of research activity; stages of research education organization in primary school.*

ПСИХОЛОГО-ПЕДАГОГІЧНІ АСПЕКТИ ОРГАНІЗАЦІЇ ДОСЛІДНИЦЬКОЇ ДІЯЛЬНОСТІ МОЛОДШИХ ШКОЛЯРІВ ПІД ЧАС НАВЧАННЯ

Оксана Лоюк, кандидат педагогічних наук, доцент, доцент кафедри фахових методик та інноваційних технологій у початковій школі, Уманський державний педагогічний університет імені Павла Тичини.
ORCID: 0000-0001-6027-0895
E-mail: lov1207@ukr.net

У статті обґрунтовано актуальність та необхідність залучення молодших школярів до дослідницької діяльності у контексті основних завдань Нової української школи; здійснено короткий аналіз досліджень із заявленої проблеми; подано трактування понять «діяльність», «дослідницька діяльність». Виокремлено дві взаємозалежні фази (підсистеми) дослідницької діяльності: фазу пошуку інформації та аналізу проблем (підсистема надбання знань про об'єкт) та фазу обробки інформації й оформлення результатів навчального дослідження (підсистема перетворення й використання знань). Визначено психолого-педагогічні аспекти організації дослідницької діяльності молодших школярів під час навчання: врахування вікових особливостей прояву та розвитку пошукової активності у дітей 6–10 років; дидактичні завдання дослідницької діяльності; специфічні вміння педагога для розв'язання завдань дослідницького навчання; етапи організації дослідницького навчання в початковій школі. Означено якості та вміння молодших школярів як результат їхньої дослідницької діяльності. Також коротко

окреслено форми організації дослідницької діяльності учнів на уроках. Запропоновано методи навчання, що сприятимуть успішній реалізації дослідницької діяльності молодших школярів (спостереження, дослід, експеримент, інтерактивні методи навчання). Використано такі методи вивчення досліджуваної проблеми: теоретичний аналіз психологічних, педагогічних, соціологічних, філософських джерел із досліджуваної проблеми; узагальнення та інтерпретація результатів наукових досліджень.
Ключові слова: *молодші школярі; діяльність; дослідницька діяльність; пошукова активність; організація дослідницької діяльності молодших школярів; дидактичні завдання дослідницької діяльності; етапи організації дослідницького навчання в початковій школі.*

One of the main tasks of the New Ukrainian School is the development of a child's talents, abilities, competences, all-round skills, independence, creativity and curiosity in accordance with age and individual psychophysiological characteristics and needs. Younger schoolchildren's involvement in research activities is an important factor that makes it possible to implement it successfully. Their implementation in the educational process activates the child's self-development mechanisms and transforms learning into self-learning.

In this regard, the State Standard of Primary Education states that the tasks implementation of primary education is based on such values as the joy of knowledge, which is conditioned by the use of research and project activities in the educational process; a free personality development by supporting independence, independent thinking, optimism and self-confidence [4]. Therefore, the main task of research education in primary school should be to activate children's educational work, give it a creative character, and transfer the initiative to pupils in organizing their own cognitive activity.

The basics of research education were considered in the works of humanist pedagogues of the Renaissance, in the works of pedagogy classics by J. Komensky, J. Locke, J. Rousseau, I. Pestalozzi and others. At the beginning of the 20th century, this idea was promoted, implemented and developed by the American educator and philosopher J. Dewey. In the second half of the 20th century, the works of S. Keiplan, A. Leontovich, I. Lerner, O. Matyushkin, Ya. Ponomaryev, N. Shumakova, O. Savenkov [13] and others considered the conceptual foundations of pupils' research activity formation.

In the works of V. Davydov, O. Dusavytskyi, O. Zaporozhets, V. Kudryavtsev, N. Morozova, G. Pantyukhin, and A. Usova, it has been emphasized that shortly before the older preschool age, cognitive-research activity is separated into a child's special activity with its own cognitive motives, with a conscious intention to understand how things are arranged, learn new things about the world, organize ideas about different spheres of life. By the time of entering the first grade, the child develops the ability for analytical and synthetic activity not only in relation to objects that are directly perceived, but also on the basis of ideas. By mastering research activities, the child learns examples of practical and mental actions, develops his own rules of behavior, ways of acting and acquires internal experience, which leads to the formation of a research skill set.

However, as modern native scientists T. Mier, N. Padun [11], O. Sokurenko [15] note in their works, in the educational practice of the primary school, the unsystematic nature of pupils' research skills formation is often observed, which has been reflected in the acute problems of school education – in the low level of their educational motivation and cognitive initiative, in the inability to carry out and regulate educational and cognitive activities. Therefore, there has been a need to resolve the contradiction between the objective need of primary school practice to expand the research aspect of junior schoolchildren's activities to

master the educational program and the insufficient theoretical justification of the psychological and pedagogical characteristics of its organization in the learning process.

The purpose of the article is to determine psychological and pedagogical aspects of junior schoolchildren's research activities organization in the educational process.

The current stage of human development is connected with the growing role of each individual as a subject of his personal and, therefore, general humanity's future. As a consequence of all civilizational changes, the social order of society regarding school has changed: it is the formation of a creative personality, which, guided by ethical criteria, is able to independently determine the purpose of its activity, plan it, select socially acceptable methods of its implementation, bear responsibility for the results of its activity and establish them in individual experience. In other words, society needs a person – a subject of activity, a person who knows how to work for results and is capable of certain socially significant achievements.

We consider it necessary to dwell on such important concepts for our research as "activity" and "research activity".

We will give a definition of the concept of "activity" from the point of view of philosophy, sociology, and psychology:

- a form of activity that characterizes the ability of a person or related systems to cause changes in being (philosophy) [17];
- a person's way of being in the world, his ability to make changes in reality. The main activity components are the subject with his problems; the goal, according to which the subject is transformed into the object, to which the activity is directed; a means of achieving the goal; activity result (sociology) [16];
- the subject's activity, aimed at interacting with the environment in order to satisfy one's own needs (psychology) [12].

The activity process begins with setting a goal, followed by tasks specification, drawing up a plan, schemes of actions that should be performed, after which the pupil moves to substantive actions, uses certain tools and techniques, performs the necessary procedures, compares the course of personal educational activity and its intermediate results with the set goal, makes adjustments in his further activities. Such an approach – from pupil's activity of mastering reality to internal personal transformations, and from them to the assimilation of cultural and historical achievements – constitutes the core of the educational process of a personally oriented type, the organic component of which, in our opinion, should be pupils' research activity.

Research activity, as one of the activity types, is characterized by all its specified characteristics. However, it is distinguished from other types of activity by certain features, namely: creative nature, conducting one's own research.

The definition of the term "research activity" is not the only one in the psychological and pedagogical literature. With this in mind, we consider it necessary to take into account different interpretations of this type of activity. So, the research activity is:

- "a creative process of interaction between two subjects (teacher and pupils) in order to find an answer to the unknown, during which cultural values are transmitted between them and, as a result, a worldview is formed. In this case, the teacher acts as an organizer of research activity conditions, which become an impetus for the formation of pupil's internal motivation to solve any scientific or

life problem from a creative, research position" (O. Marchenko) [7, p. 103];

- "cognitive activity aimed at developing new knowledge about objects and processes, deepening the already accumulated knowledge of the subject, realizing one's own desires and opportunities, satisfying interests, revealing the gifts and abilities of each child. This activity involves each participant obtaining a concrete result in the form of a set of knowledge and skills..." (S. Serova, N. Fomina) [14, p. 27];
- "self-realization of one's own creative potential, a means of developing analytical and synthetic thinking" (N. Bilyk, L. Mykhaylyk) [2, p. 29];
- "an effective means of increasing the quality and efficiency of knowledge and skills, a complex dynamic system that is a combination of individual's will, emotions and intelligence, aimed at finding the essence of the things nature and their cause-and-effect relationships" (H. Kolinets) [6, p. 29];
- "a set of intellectual and practical actions that ensure the individual's ability to make independent observations, generalizations, and analysis of reality processes and phenomena; to the acquisition of new knowledge and its application in accordance with the set goal of research activity" (M. Vashulenko, S. Dubovyk) [3, p. 3];
- "a type of educational and cognitive activity with elements of a creative nature, aimed at searching, researching and studying the reality processes and phenomena in order to accumulate and systematize fundamentally new knowledge and information" (N. Padun) [11, p. 90–91].

As we can see, there is no established definition of the term "research activity" in pedagogical science. And yet the analysis of the works shows that despite the ambiguous concept interpretation, most researchers and scientists agree that pupils' research activity is connected with their solving a creative task, the discovery of subjectively new knowledge, and the emergence of new personal opportunities. It contributes to the formation of pupil's positive self-esteem, generates self-confidence and a sense of satisfaction with the achieved success.

In the process of research activity, two interdependent phases (subsystems) can be distinguished:

a) phase of information search and problem analysis (a subsystem of acquiring knowledge about the object);
b) phase of information processing and registration of educational research results (a subsystem of transformation and knowledge use) [9].

Although these two phases are related, they are also relatively independent. Their connection has been expressed in the fact that, before processing information, it must be received. Different strategies and means of cognitive activity have been used here. In addition, students often differ in their ability to search for and process information. Those students who successfully search often have difficulties processing the information they find, understanding it and making sense of it. On the other hand, other schoolchildren successfully process information found by someone else, but are unable to cope with the search themselves. In other words, some behave as "theorists" and others as "experimenters", with all the positive and negative consequences that follow. Differences between the search for information and its use are important and should be taken into account by the teacher when

organizing research activities [9].

The content defined above prompts us to determine the psychological and pedagogical aspects of junior schoolchildren's research activities organization in the learning process.

A child's need for research is biologically determined, as a child is born a researcher. An insatiable thirst for new impressions, curiosity, a constant desire to observe and experiment, independently search for new information about the world are traditionally considered the most important features of children's behavior.

In the context of these considerations, the question of age differences in research behavior and search activity becomes especially important.

Junior schoolchildren's cognitive interests are not limited to the school desk and socially approved interests, such as drawing, sculpting, music, sports. The desire to explore and master the surrounding world, which has significantly increased in scale as soon as a child reaches school age, largely determines his interests at this age stage. Pupils' cognitive interests in the 1st and 2nd grades are mostly direct in nature, manifesting in interest in the objects' novelty, educational activities content, which attracts pupils primarily as a process that ensures the child's activity. Third and fourth graders begin to show interest in mental work, in the very content of cognitive activity [5, p. 12]. N. Bibik singles out the junior school age as the brightest in the expression of interest and the most favorable for pedagogical guidance. The pupil's natural curiosity leads to readiness for knowledge, sensitivity to the unknown, and the need for self-affirmation. For the teacher, this means encouraging children's creative intentions, the need to ensure the exploratory nature of their activities [1, p. 54].

The main neoplasms of preschool age (emergence of mediated motivation, internal ethical authorities) and primary school age (reflection, ability to learn or educational independence, ability to understand someone else's point of view), necessary for learning at school, are closely related to the pupil's attitude to search activity, which is the main behavioral manifestation of schoolchildren's educational independence at the interpsychic action level.

Search activity combines two human abilities: the ability to overcome one's own limitations, to go beyond the limits of one's existing experience, and the ability to act intelligently, to see the basis of one's action. Pupils' search activity increases by the middle of primary school age and reaches a plateau in the third-fourth years of study.

The search activity dynamics of the class and each pupil is a pedagogically controlled, man-made characteristic of learning, and it is within the power of teachers to teach children to manage it. However, research activity is not limited to the presence of search activity, it also involves the analysis of the obtained results, assessment based on them of the situation development, forecasting (building hypotheses), modeling and implementation of one's future, predictable actions – research behavior correction.

As a result of research activities, junior schoolchildren should develop such qualities as openness to other opinions, communicative competence, intellectual activity, inquisitiveness, independent thinking, the ability to discuss, insight, and self-criticism. In addition, pupils can master the following skills: see a problem, check the information used, analyze the statement underlying the information, consider alternative opinions, determine the presence of information subtext, synthesize the acquired knowledge, draw conclusions, make optimal decisions [3].

Research activities contribute to the child's independent and active study of the world around him, and, therefore, the research behavior formation. The latter is especially valuable because it creates a reliable foundation for the gradual transformation of learning and development processes into higher-order processes – self-learning and self-development.

Didactic tasks of research activity at school are:

1) provision of pupils' high-quality educational training;
2) purposeful formation of ways and procedures of creative cognitive search in the pupil's personality – new forms, methods, and means of knowing reality and life activities;
3) development of pupils' intellectual abilities, research skills and creative potential and formation of an active, competent, creative personality on this basis [9].

The paradox of exploratory learning is that a teacher who works in line with his ideas can teach a child even what he cannot do himself. He must, of course, be a creator-researcher, but not the bearer of all knowledge. In the conditions of research education, the teacher is not obliged to always know the answers to all questions, but he must be able to investigate various problems, find any answers and be able to teach children these matters [13, p. 6–9].

To solve the research training tasks, the teacher needs to master a set of specific skills*:*

- to be hypersensitive to problems, to be able to see the "amazing in the everyday". Be able to find and set of real educational and research tasks for pupils in a form that is understandable for them;
- to be able to captivate pupils with a didactically valuable problem, making it children's problem;
- to be able to perform the functions of a coordinator and a partner in a research search. Helping children to be able to avoid directives and administrative pressure;
- to be tolerant of pupils' mistakes made by them in their attempts to find their own solution to the problem;
- to offer help or refer to the necessary sources of information only in those cases when the pupil begins to feel the hopelessness of his search;
- to organize events for conducting observations, experiments and various kinds of research;
- to provide an opportunity for regular reports of working groups and views exchange during open general discussions;
- to encourage and develop a critical attitude towards research procedures in every possible way;
- to be able to stimulate proposals for improving work and putting forward new, original research directions;
- to monitor closely the dynamics of children's interests in the researched problem;
- to be able to complete research and work on discussion and implementation of solutions in practice before children show signs of losing interest in the problem;
- to be flexible and, while maintaining high motivation, allow some pupils to continue working on the problem on a voluntary basis, while other pupils are looking for ways to approach a new problem [13, p. 10].

The organization of research education in primary school involves three stages:

I stage *– the teacher formulates the problem and clearly outlines the ways to solve it,*

but the pupils must find the solution on their own (1st grade). It is worth organizing classes with independent elements for the formation of thinking operations (synthesis, analysis, generalization, classification, and comparison), therefore, junior schoolchildren get an idea of objects' qualities and properties and phenomena, causes and consequences. It is suggested to use elements of observation, mini-research and mini-projects of the research direction, consideration and subject analysis, creation of problem situations, excursions, modeling.

II stage *– the teacher formulates the problem, the ways and methods of solving it, and the pupils find the solution on their own (2nd grade).* The amount of work is increasing. Involvement in research activity should be flexible, personalized, differentiated, based on pupils' personal research experience. It is advisable to introduce elements of educational discussion, mini-research, project activity, observation of a plan developed in advance, mini-reports, research excursions, role-playing games, etc.

III stage *– schoolchildren independently identify and formulate a problem, look for ways to solve it, find solutions independently (3rd–4th grades).* The main attention is paid to the accumulation and enrichment of children's research experience on the basis of personal achievements. There is a systematic and purposeful maintenance of research activity with mandatory presentation and teacher's commenting results. Lessons are practiced – research, development, execution and defense of research works, project activity, experiment, home research, questionnaires, observations, etc. [8].

At all stages of this work, the teacher must be clearly aware that the main expected result is the development of creative abilities, the child's acquisition of new knowledge, skills, research behavior and received material processing. In no case, it (the result) should be confused with the product that is born as a result of a small researcher's work. More precisely, the teacher must keep in mind that in this case he is dealing with not one "result", but at least two.

The first, of course, is the most important, let's call it pedagogical. The pedagogical result is, first of all, the experience of independent, creative, research work, new knowledge and skills, a whole range of mental formations that distinguish a true creator from a simple performer, which is invaluable in the educational sense. The second is what the child creates with his mind and hands – a layout, a project, a report, etc.

A finely detailed sequence must be followed to achieve this result:

1. Problem actualization (identify the problem and determine the direction of future research).
2. "Incubation period". Defining the research scope (formulating the main questions, the answers to which we would like to find).
3. Choosing a research topic (try to define the research boundaries as strictly as possible).
4. Developing a hypothesis (develop a hypothesis or hypotheses, including unreal provocative ideas).
5. Identification and systematization of solution approaches (choose research methods).
6. Develop a research methodology.
7. Collection and processing of information (record the acquired knowledge).
8. Analysis and generalization of the received materials (structure the received material using known logical rules and techniques).

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9. Report preparation (defining the main concepts, preparing a report based on the research results, etc.).
10. Report (defend it publicly in front of peers and adults, answer questions).
11. Discussion of the completed work results. Reflection [13, p. 42–43].

It is especially important for teachers to clearly understand that any child's research work must be brought, if not to the end, at least to a result. Therefore, in the process of organizing children's studies, attention should be paid to recording the moments of completion of their creative projects and integral parts. The completion of educational and research work by junior schoolchildren must necessarily be a public results presentation and a collective discussion.

Research activity as a specially organized form of pupils' self-education should be interesting, accessible and useful.

For junior schoolchildren, the most effective form is collective-individual search and research activity, which ensures the gradual mastering of research methods in joint activities (familiarity with the stages, information selection and processing methods, drawing up a research program, results from analysis and evaluation, etc.) and individual self-determination of each pupil at each of the research stages regarding the choice of form and method of their own participation in a joint creative work.

Observation, research and experiment are methods that provide an empirical level of knowledge and differ from others in that they cause more active mental activity; develop pupils' research skills, their creative abilities, independence, self-control and purposefulness. These methods provide an opportunity to see various processes, objects properties in their natural form, to understand the essence of natural and social phenomena, contribute to the pupils' observation, thinking and speech training. A pupil who learns about the world while sitting at a desk in the classroom and a pupil who learns by observing and exploring objects in the environment develop differently. Knowledge occurs in action, through human actions [10]. Therefore, the successful implementation of research activity in the educational process of primary school is facilitated by the teacher's use of various interactive methods in the lesson, which ensure the development of pupils' creative activity, the formation of their research skills, divergent thinking, problem vision, fantasy and imagination.

So, the article proves that the active participation of junior schoolchildren in research is based on their natural desire to independently master the educational material, which contributes to a child's creative self-realization, the development of his intelligence and critical thinking, the formation and improvement of the ability to conduct research, independently acquire and apply knowledge.

Psychological and pedagogical aspects of the organization of junior schoolchildren's research activity in the learning process have been determined: taking into account the age-specific features of the manifestation and development of search activity in children aged from 6 to 10 years, didactic tasks of research activity, teacher's specific skills to solve the tasks of research education; organization stages of research education in primary school; separate forms and methods of organizing research activities in classes.

Prospects for further research in the chosen direction may be related to the continuity between preschool and primary education in matters of organizing children's research activities.

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