Sifatli ta'lim-yorqin kelajak
ISSN: 3060-4761

TerDPI ILMIY XABARNOMASI
SCIENTIFIC BULLETIN OF THE TerSPI
НАУЧНЫЙ ВЕСТНИК ТерГПИ

www.xabarnoma.terdpi.uz

UDK: 341.72

WAYS OF FORMING LEARNERS' RESEARCH SKILLS

A.S. Murzinova
Kazakh National Women's Teacher Training University,
Republic of Kazakhstan, Almaty
E-mail: murzinova_1993_kz@mail.ru

Abstract. The article deals with the problem of the formation of research skills of learners within the framework of several approaches based on the presence of personal and motivational readiness of learners to carry out research activities. For the process of forming learners' research skills, it is necessary to use some approaches to solving this problem in a comprehensive manner, for example, such as systemic, activity-based, informational and contextual. A systematic approach makes it possible to reflect the subject of research from all sides, providing a holistic perception of the object under study. In this case, it is the study of research skills and its components as subsystems, taking into account their internal and external relations, features of functioning and development. The system of formation of research skills manifests its properties in the process of interaction of the object with the environment. We consider the learning environment as a specially organized environment in which the goals, methods, means and organizational forms of training are aimed at forming the research skills of future specialists. Research skills are formed in the process of activity, therefore, as a methodological basis for the formation of research skills, we use an activity-based approach. The development of learners' research skills is facilitated by their experience in independent research activities. Learners are required to be able to systematize and analyze information obtained from various sources, summarize facts and phenomena and draw the right conclusions. The information approach is provided in the process of solving problems when learners consistently carry out the main information processes (search, collection, analysis, processing, preservation, presentation of information, etc.). The contextual approach is provided through the formation of research skills in the process of research activities. In contextual learning, the mindset for future professional activity is realized. The content of the training is designed for the subject of educational activity. With contextual training, there is a stable internal orientation to future work, a positive attitude to professional activity, professional qualities of the future specialist develop.

Keywords: research skills, teaching methods, teaching techniques, teaching tools, creative approach, universal skills, creative potential, conditions.

Introduction. The changes taking place in today's society require new approaches to education, pedagogical technologies engaged in the personal development of the individual, creative initiative, the formation of their own motor skills in the information fields, universal skills in setting and solving tasks for solving life problems arising in everyday life, self-determination, professional activity in learners. In this regard, the upbringing and development of a mobile and self-fulfilling personality, the formation in learners of the ability to think independently, acquire and apply knowledge, carefully consider the decisions made and clearly plan actions, effectively cooperate in groups different in composition and profile are of particular importance. A person of the new century necessarily needs the skills of a research search in order to reveal his creativity,

creative potential, intellectual capabilities. This requires the correction of the substantive, methodological, technological aspects of education, the revision of previous value priorities, goals, pedagogical means, the role and significance of research behavior in human life and research methods of teaching in educational practice. Therefore, the main task of modern education is the formation of learners' research skills. Involving learners in research activities allows them to learn and create something new, express themselves clearly, make decisions, and project their interests [7].

Materials and methods. The research materials were based on the authors' data collected in accordance with the topic as a result of scientific research and analysis of data in the funds of scientific literature, the internet, publications. The article widely used the works of A. P. Gladkova, E. G. Sukhanova, N. A. Synkova, S. V. Strizhak and other authors and used methods of characterization, differentiation of information, systematic analysis.

Results and discussion. Since the scientific literature does not form an unambiguous definition of the concept of "research ability", "research skill", these concepts are interpreted by each researcher in different ways. For example, according to the researcher V.P. Ushachev, "research ability is the ability of a subject to perform mental and practical actions corresponding to research activities, subject to research logic based on the knowledge and skills acquired in the course of relying on scientific foundations" [1], N.V. Sychkova: "research ability-on the basis of methodology, method and technique, the ability to perform various types of scientific and pedagogical activity." Research ability serves as the basis for the formation of learners' skills and abilities to work with scientific literature, the ability to observe and analyze pedagogical phenomena, as well as the ability to formulate hypotheses and other aspects of research activity [2]. I.A. Zimnyaya and E.A. Shashenkova:"research ability – independent observation, experience, search ability acquired during the process of solving research tasks" [3]. S.I. Bryzgalova:"research ability – ways to implement personal activities" [4]. A.I. Savenkov: "research skills – the ability to see a problem, ask questions, make predictions, give definitions of concepts, classify, observe, experiment, draw conclusions, structure information, work with text, defend and prove one's opinion" [5]. P.V. Seredenko:"research skills are a set of approaches that contribute to the organization of research work aimed at mastering new knowledge, carry out intellectual and empirical activities" [6]. Thus, one of the teaching methods used in the system of science, a way of forming a distinctive style of educational activity, is the research skill [8]. Research skill – the ability to search, find, collect, analyze, interpret and evaluate information in accordance with the topic under study [9].Formation of research skills of learners – voluntary transfer of learners to the position of a researcher, manifested in the ability of a person to a certain type of activity [10]. For the formation of research skills of learners, it is necessary, first of all, to find and implement conditions, stages that meet the set goal. N.A. Semenov proposed the following conditions for the formation of research skills of learners:

1. Goal-oriented and systematic. Work on the formation of research skills should be carried out regularly, both in the classroom and in extracurricular activities. To form the skills and abilities of research activities, the teacher needs to use the material of lessons of various disciplines, often use the research method in teaching topics.

2. Motivational. Learners should be helped to see the essence of creative research activities, from which they should see the possibility of realizing their skills and

capabilities, the path of self-development and self-improvement.

3. Creative environment. The teacher must contribute to the creation of a creative, working atmosphere, maintain interest in research work.

4. Psychological comfort. One of the tasks of the teacher is to stimulate the creative manifestation of learners, the desire to achieve creative search. It is important that learners are not afraid to make mistakes, avoid negative assessments. At the same time, another task of teachers is not to suppress the desires, impulses, creative ideas of learners, but to support and guide them. Judgments "you did the wrong thing"," you are doing the wrong thing" inhibit the desire to work, to move forward. Each learner should be given the opportunity to feel their strength, to believe in themselves.

5. Teacher's personality. The formation of creative skills that involve research requires a creative teacher who seeks to create a creative, working environment and has certain knowledge and training to conduct research activity classes.

6. Accounting for age characteristics. The training of research skills should be carried out at a level accessible to the perception of learners, the study itself should be possible, interesting and useful [11].

Stages of formation of research skills of learners:

1. Initial stage. At this stage, under the guidance of the teacher, learners get acquainted with new approaches to educational activities. The teacher and the learner determine and formulate the purpose of the research work. Then the teacher explains to the learner the content of the methods of research work and the procedure for its implementation. Further, under the guidance of the teacher, the actions necessary to master this and other methodology are performed. Knowledge of the method and sequence of actions is recorded in the form of a logical diagram or memo.

2. *Intermediate stage.* Training and application of the methods of studied activities: performing exercises, solving logical tasks.

3. *The final stage.* Transfer of the learned activity to new material, to other conditions [12].

Currently, the problems of the formation of research skills of learners are discussed by G. K. Selevko, N.N. Sandalova, P.V. Seredenko, V.F. Zueva, A.Ya.Gerda, B.E. Raikova, N.P. Lazutina, A.V. Khutorsky, L.A. Lukyanova, M.N. Markov, I.A. Ilnitskaya, M.I. Makhmutov, V. T. Kudryavtsev, A.G. Yamshchikova, N.V. Zenina, N.A. Alexandrina, T.N. Petikova, M.A. Rodionov and many others were involved. For example, N.N. Sandalova cited a number of teaching methods and tools that contribute to the formation of research skills of learners. Training methods:

1. *Explanatory-illustrative* - the teacher conveys the prepared information by various means, and the learners receive it and carry out the process of understanding and confirmation in the memory. Methods such as conversation, explanation, working with a textbook, visualization are used.

2. *Problematic* - the teacher poses a problem to the learner and shows how to solve it, revealing the contradictions that arise. The peculiarity of this method is to show the algorithm of the process of scientific knowledge. In this case, learners observe the logic of problem solving; get acquainted with the ways and methods of scientific thinking, and the model of the culture of developing cognitive activities.

3. *Research* - learners are given cognitive tasks to perform independently, choosing the necessary methods and tools. This method ensures the development of learners' creative abilities, creative use of knowledge. In this regard, they learn the

methods of scientific knowledge and gain experience in cognitive, research, and creative activities.

4. *Project method*-this method is a set of actions, methods and techniques of learners, the solution of the problem of which is formalized as a type of individually significant and final research product for learners – is carried out in a certain sequence to achieve the set research goals.

5. *The method of didactic games* – this method is a group, purposeful educational and research activity, in which each learner and team are united by the solution of the main research tasks and form their own behavior in order to win. The didactic game is an aspect of active and interactive educational activity in the planned modeling of the studied objects, systems, phenomena, processes.

6. *Case method*-learners study the situation, determine the essence of the problem, offer possible solutions and choose the best of them. Cases are based on specific evidence-based data or are close to the actual research situation.

Tools include:

- Electronic educational resources;
- Visual materials (layouts, algorithms, memos on the organization of research);
- Teaching aids (a set of tools for working with different materials);
-Educational-methodological and scientific literature (textbooks, educational and methodological complexes, workbooks, dictionaries, encyclopedias, etc.) [13].

P.V. Seredenko proposed the following methods for the formation of research skills of learners:

1. *The skill to see problems.* A problem is a complex question, a task that needs to be solved, that is, actions aimed primarily at studying everything that is associated with this problematic situation. Looking for a problem is not an easy task. Looking for a problem can be as difficult as solving it. The teacher should be flexible in carrying out this part of the research work with the learner. The learner should not necessarily require a clear consciousness and formulation of the problem, a clear designation of the final goal. The general description will be enough. The skill to see problems is an integral property of thinking. It develops for a long time in various activities.

2. *Skill to present predictions.* After identifying the problem, the search for its solution begins, that is, the next stage of the thought process – the solution of the problem. The answer to the problem posed is achieved through mental activity, which takes the form of predictions. New knowledge is first realized by the researcher in the form of a prediction, which is a necessary moment in the thought process. Assumption is the reasoning about the legal relationship of phenomena. Forecasts allow you to see the problem from a different angle, to look at the situation from the other side.

3. *Skill to ask questions.* An important skill for any researcher is the ability to ask questions. The logical structure of the question. "In the course of research," says L. M. Ilyinykh, "like any knowledge, the question plays one of the main roles and is usually considered as a form of expression of the problem. In comparison with the question, the problem has a more complex structure, figuratively speaking; it contains more "spaces" to fill it. The question directs the learner's thinking to the search for answers, awakens the need for cognition, and engages him in mental work. According to experts in the field of logic, any question can be divided into two parts: the main, primary information and the indication of its inadequacy.

4. *Skill to define concepts.* The concept is a form of logical thinking. The concept is sometimes referred to as a simple thought cell. It is a thought that reflects in a generalized way the objects and phenomena of reality, as well as the connections between them. The concept is formed by

generalization and abstraction operations. Therefore, not everything is reflected in the concept, but only the main, essential features of the identified objects. When a person gives definitions of concepts, a reflection of objects of reality appears in his mind, unimportant features of objects are mentally distinguished, and the main ones are verbally marked. "The definition of concepts is a demonstration of its meaning, the identification of the features included in its content," says A.I. Savenkov.

5. *Skill to classify.* Classification is a logical operation in concepts, dividing things into groups that are thought in the original concept.

6. *Skill and ability to experiment.* Experiment is the most important of the research methods and the most important method of cognition in many sciences. Any experience involves various practical actions for the purpose of verification and comparison.

7. *The ability to draw conclusions (reasoning).* Conclusion – a form of thinking in which new knowledge appears on the basis of existing knowledge and experience in people. There are two types of inference: inductive (from personal judgments to general) and deductive (from general judgments to particular). One of the easiest ways to master the skill of drawing conclusions is analogy. For this, two objects are compared, as a result of which it is possible to learn about the properties of one object in order to understand what they are and another object [11].

N.V. Zenina, N.A. Alexandrina, T.N. Petikova, M.A. Rodionov noted in their research the active methods and levels of formation of research skills of learners in educational and research activities. Active methods: discussions, heuristic conversations, exploratory laboratory work; for the development of cognitive interests and abilities-independent work, solving production situational tasks and its analysis, and at the levels: *low* (learners under the guidance of the teacher analyze the research problem, data, identify fundamental theoretical facts on the problem formulated by the teacher, design its solution and implement it in accordance with the teacher's task in the program of periodic activities, while the thinking operations of analysis, synthesis, comparison are used), *medium* (learners independently analyze the research problem, its condition, requirements; based on the formulated problem, it tries to put forward various assumptions; at the suggestion of the teacher, the solution is compiled and implemented, and its result is checked and analyzed with the help of the teacher, an analogy is made, a generalization is made), *sufficiently high* (learners independently analyze the research task, systematize previously known decision methods to choose the optimal method for solving the problem, in most cases independently make decisions, independently make decisions, results obtained, verification), *high* (learners fulfill the requirements of a sufficiently high level; independently conducts a theoretical analysis of the problem under study, independently formulates the problem, presents forecasts, ideas, using models, rationally using thought operations; independently carries out verification and analysis of the results obtained; at this level, learners are characterized by such levels as abstraction from real quantitative relationships and spatial forms, refinement, work with formal structures) [14].

L.A. Darinskaya said:" the formation and development of learners 'research skills in most cases occurs in the traditional learning process, but high results can be achieved when conditions are created for the design and implementation of the learner's own educational route, which reflects the age and personal development features of the learner's personality, cognitive needs, interests and opportunities"[16].

Approaches to the formation of research skills of learners: M.N. Markov suggested that it is possible to form research skills on the basis of a managerial approach. I.A. Ilnitskaya, M.I. Makhmutov, V.T. Kudryavtsev are guided by the theory of problem-based learning in solving this approach. A.G. Yamshchikova uses the interaction approach to the formation of research skills, A.V. Khutorsky's metapark approach. G.F. Zalutskaya, O.V. Lesher, Z.S. Akmanova, E. M. Gugina consider this issue on the basis of a competence approach, and M. G. Mozhaeva considers it through a technological approach. L.A. Kazantseva intends to study the problem from the point of view of an individual-oriented approach. S.I. Zinoviev, A.G. Molibog, N.L. Kolugina study the problem of the formation of research skills in the process of self-preparation of learners of higher educational institutions [15].

Conclusion. In conclusion, mastering the above methods at a certain level allows learners to implement research skills in any field of knowledge. Research skills are considered as a special type of cognitive and creative activity, determined by the functioning of search activities and mechanisms of research behavior. Today, the formation and development of learners' research skills in the discipline is considered the key to a higher level of education.

References

1 **Ushachev, V.P.** Teaching the basics of creative activity [Text]. – Magnitogorsk, 2014. – 200 p.

2 **Sychkova, N.V.** Fostering a creative attitude to the assimilation of professional knowledge among students in research activities [Text]. – Magnitogorsk, 2000. – 40 p.

3 **Zimnaya, I.A., Shashenkova, E.A.** Research work as a specific type of human activity [Text]. – Izhevsk, 2001. – 105 p.

4 **Bryzgalova, S.I.** Formation of a teacher's readiness for pedagogical research at a university: theory and practice [Text]. – Kaliningrad, 2004. – 360 p.

5 **Savenkov, A.I.** The content and organization of research education of schoolchildren [Text]. – Moscow: September, 2003. – 204 p.

6 **Seredenko, P.V.** Development of research skills of younger schoolchildren in the conditions of transition to educational standards of a new generation: Monograph [Text]. – Yuzhno-Sakhalinsk: Publishing House of SAKHSU, 2014. – 208 p.

7 **Gladkova, A.P.** The process of formation of research skills of younger schoolchildren in extracurricular activities [Text]// ISOM. – 2012. – No.4. – Access mode: – URL: https://cyberleninka.ru/article/n/protsess-formirovaniya-issledovatelskih-umeniy-mladshih-shkolnikov-vo-vneurochnoy-deyatelnosti [accessed: 09.09.2022.].

8 **Sukhanova, E.G., Synkova, N.A.** Development of research skills of schoolchildren through the use of the project method [Text]// Materials of the VIII International Student Scientific Conference "Student Scientific Forum". – 2016. – Access mode: – URL: https://scienceforum.ru/2016/article/2016029047 [accessed: 09.09.2022.].

9 **Murzinova, A.S., Tulegenov, E. A.** The concept of developing research skills of students [text] //"III International Book Edition of the Commonwealth of Independent States / "THE BEST YOUNG SCIENTIST – 2021": III International book collection of scientific works of young scientists. – Nur-Sultan, 2021.

10 **Strizhak, S.V.** Formation of research skills of schoolchildren in practical classes in chemistry [Text] // International Journal of Experimental Education. – 2013. – No. 4. – pp. 282-285. – Access mode: – URL: https://expeducation.ru/ru/article/view?id=4802 [accessed: 09.09.2022.].

11 **Seredenko, P.V.** Development of research skills of younger schoolchildren in the conditions of transition to educational standards of a new generation: Monograph [Text]. – Yuzhno-Sakhalinsk: Publishing House of SAKHSU, 2014. – 208 p.

12 **Tantsyura, L.I.** Formation of students' research skills in the context of the implementation of the Federal State Educational Standard [Text]. – Volgograd, 2017. – Access mode: – URL: https://infourok.ru/formirovanie-issledovatelskih-umeniy-uchaschihsya-v-usloviyah-realizacii-fgos-2223037.html [accessed: 09.09.2022.].

13 **Krotenko, A.N., Araslanova, A.A.** Some approaches to the formation of research skills in younger schoolchildren [Text]// Materials of the XIII International Student Scientific Conference "Student Scientific Forum". – Access mode: –URL: https://scienceforum.ru/2021/article/2018026888 [accessed: 09.09.2022.].

14 **Zenina, N.V., Alexandrina, N.A., Petikova, T.N., Rodionov, M.A.** Components and levels of formation of students' research skills in the conditions of professional self-determination [Text] // Modern problems of science and education . -2016. – No.3. – Access mode: – URL: https://s.science-education.ru/pdf/2016/3/24686.pdf [accessed: 09.09.2022.].

15 **Mizeva, V.I.** Formation of research skills among students of a technical university on the basis of a meta-subject approach// Problems of modern pedagogical education [Text]. – 2018. – No.58-4. – Access mode: – URL: https://cyberleninka.ru/article/n/formirovanie-issledovatelskih-umeniy-u-studentov-tehnicheskogo-vuza-na-osnove-metapredmetnogo-podhoda [accessed: 09.09.2022.].

16 **Darinskaya, L.A.** Development of students' research skills as a psychological and pedagogical problem [Text]// Organization of project and research activities of students. – Materials of the scientific and practical conference. – Minsk, April 19-20, 2018. – pp. 10-12. – Access mode: – URL: https://moiro.by/files/00206/obj/110/133553/doc/%D0%9E%D1%80%D0%B3%D0%B0%D0%BD%D0%B8%D0%B7%D0%B0%D1%86%D0%B8%D1%8F%20%D0%BF%D1%80%D0%BE%D0%B5%D0%BA%D1%82%D0%BD%D0%BE%D0%B9%20%D0%B8%20%D0%B8%D1%81%D1%81%D0%BB%D0%B5%D0%B4%D0%BE%D0%B2%D0%B0%D1%82%20%D0%B4%D0%B5%D1%8F%D1%82%D0%B5%D0%BB%D1%8C%D0%BD%D0%BE%D1%81%D1%82%D0%B8%20%D1%81%D0%B1%D0%BE%D1%80%D0%BD%D0%B8%D0%BA%20%D0%9D%D0%9F%D0%9A%202018.pdf [accessed: 07.01.2023.].