American Journal of Alternative Education
ISSN: 2997-3953 (Online)
Vol. 2, No. 8, Aug 2025,
Available online at: https://scientificbulletin.com/index.php/AJAE

Improving the Methodology for Developing Creativity in Schoolchildren

Arolov Davronjon Davlatalievich
Deputy Head of the Namangan Regional Department of the National Agency for Social Protection under the President of the Republic of Uzbekistan

Article information:
Manuscript received: 02 Jun 2025; **Accepted:** 11 Jul 2025; **Published:** 12 Aug 2025

Annotation: The article reviews the forms, methods and means that are actively used in the development of creative abilities of schoolchildren, paying special attention to their role and significance in practical processes. In addition, it provides brief in-formation on the level of effectiveness of certain methods in this regard. Methods of developing creative tasks and their application in the educational process of computer science, developing educational methods that serve to develop students' creative abilities, are used to develop students' creative activities and increase the effectiveness of teaching.

Keywords: student, creativity, creative abilities, education, problem-based learning, abstract-deductive method, Innovative methods, advanced technologies, school education, innovative technologies, students' abilities.

Introduction. Today, in a period of rapid social changes, in a developing society, the personal and social importance of creative thinking is increasing sharply. Therefore, the problem of developing students' creative abilities is urgent. An important task of a modern school is to create learning conditions that provide the highest level of psychological comfort for students and provide them with the opportunity for intensive development in accordance with their individual needs and abilities.

Currently, in each educational process at school, the teacher performs a new task aimed at preparing students to become successful individuals in life and providing them with the skills of the 21st century. The topic of developing students' creative abilities and the methods and tools used for this is no exception. It is also expected that the development of students' creative abilities and the methods and tools used for this will develop students' intellectual abilities to adapt to different conditions, respect society, and be tolerant of ideas. It is known that the essential skills of the 21st century include specific skills that need to be strengthened in educational activities, namely, higher-order thinking skills such as critical thinking and creative abilities, problem-solving, metacognition, communication skills, collaboration, innovation, creativity and information literacy.

The International Labor Organization identifies creativity as one of the essential skills necessary for modern life and emphasizes the need to develop creativity as part of the integration of academic education and professional training. Creativity is one of the main problems of education in the modern world. In particular, in Europe, the "Creativity at School" project has been developed, which is funded by the EUA (European University Association) under the Socrates program. In addition, during a survey conducted by the University of Mostar among individuals in the field of education (1014 teachers) in 13 countries (Australia, New Zealand, China, Hong Kong, Taiwan, India, Philippines, Indonesia, Vietnam, Thailand) entitled "The State of Creativity in Education", 62% of respondents who participated in the

survey believed that teachers should have creative qualities in the subjects they teach, The majority of respondents consider that teachers, not parents, are primarily responsible for this activity.

In our republic, in recent years, efforts have been made to improve the quality of the school system, develop students' creative activity in secondary educational institutions, direct students to master creative ways of solving life problems, and create legal and regulatory frameworks for self-development and self-education. “...bringing the knowledge and skills of personnel to the international level” were identified as priority tasks.

Theoretical and methodological issues of the methodology for developing creativity in students in our country were discussed by M.T. Yulchiyeva, G.F. Adizova, D.S. Qakhorova, M.Kh. Vakhobova, G.M. Korayeva, H.O. Toshtemirova, Sh.Kh. Khayitova and others. Theoretical, methodological and organizational issues of the methodology for developing creativity in students have been studied in detail by foreign scientists such as Gemma Rodríguez, Nora Perez, Gemma Nunez, Josep-E. Banos & Mar Carrio, Rafael Segundo-Marcos, Ana Merchán Carrillo, Veronica Lopez Fernandez, María Teresa Daza Gonzalez, Brwa Adnan Saeed, N.V. Uvarina, O.V. Shtakina, L.N. Shutareva, Sh.Z. Radzhapov, S.Sh. Ergasheva, I.A. Urinboeva, A.M. Karimova, G.T. Jalolova, A.N. Mikhailina, Ye.A. Khripunova.

When thinking about creativity, it is necessary, first of all, to thoroughly analyze the essence of creativity. The study of the essence of creativity is, one might say, a very complex issue, since it is tasked with solving important methodological issues of studying man and nature. These processes include the sources of creativity development, the interrelationship between the biological and social, objective and subjective, individual and collective.

Sh.S. Sharipov defined inventiveness as “a type of creative activity aimed at developing a new technical solution, confirmed by patents by the relevant authorities, and inventive creativity is a general characteristic of this process associated with such creative qualities as intelligence, resourcefulness, independent and critical thinking in a person” [17].

Expressing our opinion on the development of creativity in schoolchildren, it is worth noting that the conclusions given by M.G. Yaroshevsky in this regard are noteworthy. According to the scientist, a systematic approach to the creative process requires studying the three-dimensional composition and their interdependence. They consist of the content of things and phenomena, social and personal: the content of things and phenomena - heuristics, the mental "fabric" that creates a new image of a thing, which then turns into a scientific text and emerges as new ideas, theories and discoveries. These heuristics consist of: analogs, metaphors, comparisons, models, which usually constitute the content of thinking and have a visual form; social content - such creativity is manifested as a cognitive-dialogical "initial activity". Thus, opponents, alternatives also give impetus to the development of creative processes; personal content - consists of personal aspirations, internal purposeful desires and the specific qualities of the subject of creativity, and consists of new signs, changes that arise in the continuous organization of creative processes" [13].

Uzbek pedagogue and psychologist Zarifjon Gulomov wrote: “The creative process reveals the inner universe of a person, in which each person finds his highest potential.”

The following factors influence the creative activity of schoolchildren. Biological factor - this factor includes creativity, initiative, physiological maturity and other aspects that are passed down from generation to generation. These abilities are described by the great Eastern thinker ABU ALI IBN SINO, who said that "every born child has certain talents and abilities in his genes, and these abilities develop under the influence of the social environment, either as a result of attention, or disappear as a result of inattention from the social environment." Even a student who is accepted into a first-year university tries to show his new, unique positive qualities. Therefore, we, as educators, must effectively use this opportunity.

During the years of independence, certain measures were taken in our country to educate young people in the spirit of patriotism, respect for our national traditions and values, to raise a spiritually mature and

physically healthy generation, and to protect their rights and interests. “Strategies for the development of creative activity constitute the theoretical and practical foundations of their purpose, object, basic concepts, criteria, etc.” In order to speak about the general essence of strategies for the development of students’ creative activity, it is first necessary to understand the fundamental meaning of this concept.

The specific features of the creative activity of schoolchildren depend on their age, psychological state, environment, and personal abilities. Taking into account these features, it is important to organize the educational and upbringing process in order to develop creative abilities in them.

Our main goal is to educate creative students, which means that when teaching students, we must first pay great attention to the formation of creative qualities in them.

The 9th grade students of secondary school No. 15 in the Chust district of Namangan region were selected as the object of research.

The stage of determining the level of students' knowledge in the experimental and control groups and comparative analysis of the pedagogical experimental and test work on the research topic was carried out during the 2023-2024 academic year. A total of 50 students participated.

Methodology and methods. Developing students' creativity, in turn, requires a new approach, which means developing a methodology for developing students' creativity.

A methodology for developing students' creativity has been developed for the 9th grade subject "Informatics".

When developing the methodology, the following methods and tools were used to collect management and information, which allow the teacher to make timely management decisions and make adjustments to the process of achieving the final result, determine the level of compliance of the results achieved with the set goal.

- educational materials: educational literature, sets of educational tasks;
- technical means of teaching: computers were used.

The methodology consists of interrelated “Introduction”, “Main” and “Final” stages.

The introductory stage, in turn, includes interrelated sub-stages of organizational initiation, setting goals and objectives, and activating basic knowledge.

Organizational initiation part. The teacher greets the students, checks attendance and checks their preparation for the lesson.

Setting goals and objectives part. Students are introduced to the topic of the lesson, its purpose, work tasks and methods of their assessment. Tasks are clarified and a learning activity situation is created.

Part of activating basic knowledge. The topic covered is assessed through theoretical tests.

The main stage also includes the components of introducing new material, which are interconnected, and consolidating the learning material.

Part of introducing new material. According to the logical structure of the new topic, students are given explanations about the main elements of the new material to be studied, instructions on how to study this new learning material in small learning groups through task questions and teach each other. Students are allowed to start their activities in small learning groups.

The student first independently familiarizes himself with the new topic material according to the task question, and then studies it through question-answering with group members. After that, he demonstrates his knowledge in front of all groups, that is, he acts as a “teacher”. At this time, other students listen, observe, analyze. After the “lesson”, the “teacher” evaluates the teaching activity.

Part of strengthening the educational material. The teacher organizes practical activities to consolidate

theoretical knowledge and explains and shows his tasks, the content of practical assignments, workplaces and ways to perform practical work in them. At the same time, he gives instructions on technical safety rules and compliance with them during the training process. Permission is granted to start work.

During the training, the teacher monitors the correct execution of work, current instructions, and answers students' questions. At the same time, he pays attention to those who are having difficulty mastering and directs them to work well and quickly. The exemplary work is shown as an example to others, and conversely, if the technological sequence or technical safety is violated during the work, the training is stopped and the consequences of the mistake made are shown to the entire training group as an example. Half an hour before the end of the training, the teacher and the production foreman check the knowledge and skills of the students at the training and work places through clear and short questions.

The final stage is an analysis of the lesson based on the teacher's personal observations. The criteria for evaluating the work of groups and the students examined are the quality of the tasks performed and their coordination during the lesson.

The teacher draws attention to the general and specific shortcomings of the students identified in the process of work, and instructs them not to repeat these mistakes in subsequent lessons. The lesson ends with the announcement of the topic of the next lesson.

The purpose of the pedagogical experimental work was to prove the correctness of the hypothesis put forward in our scientific research. This process can be conditionally divided into the following stages:

1. The preparatory stage was held in the 2nd quarter of the 2023-2024 academic year, during which the following work was carried out:

- identification of the main areas of research;
- study of the theoretical and practical state of the problem;
- conducting questionnaires with secondary school teachers;
- analysis and study of educational and normative documents;
- selection of a base school, study of the availability of material and technical, scientific and methodological basis and pedagogical conditions for conducting experimental work in it;
- preparation of materials necessary for conducting experimental work;

2. The second stage - in the 3rd quarter of the 2023-2024 academic year, the following was implemented:

- start of experimental work according to the plan;
- Analyze the lessons of Informatics and Information Technologies;
- Analyze the results of experimental tests in terms of quantity and quality;
- Determine the level of students' mastery through the use of creative tasks in teaching the subject of "Informatics and Information Technologies" in grade 9;
- Collect scientific evidence, summarize it;
- Discuss the results of experimental tests;
- draw scientific conclusions, scientifically substantiate the results of the research, determine their relevance to the hypotheses and tasks;
- measures were taken to statistically process all the materials collected during our research, prove their reliability, and put our methodological work into practice.

While the educational process in the control classes was implemented based on the current curriculum and program, teaching methodology, in the experimental groups, the teaching of the subject "Informatics and Information Technologies" was carried out using the opportunities of creative tasks.

The results of the control and experimental groups were systematically analyzed, compared with each other, and conclusions were drawn. Where necessary, the opinions and comments expressed by teachers directly involved in this process were discussed in detail, and changes were made to the teaching methodology.

The results of the control and experimental test groups were systematically analyzed, compared with each other, and conclusions were drawn. Where necessary, the opinions expressed by teachers directly involved in this process were discussed in detail, and changes were made to the teaching methodology.

When assessing the quality indicators of the knowledge formed in students, conscious self-determination, the systematization of knowledge within the framework of State Educational Standards, and the ability to creatively use them were used as criteria. For this, we used entrance and exit tests.

In conducting the pilot tests,

General secondary school No. 15 in the Chust district of Namangan region was selected and certain preparatory work was carried out.

During the pilot testing, the content, learning conditions, and methods of teaching informatics and information technologies were selected, and questions and answers, results of pedagogical observation, and criteria for monitoring and evaluating student knowledge were collected. It has been proven that teaching the subject of "Informatics and Information Technologies" using Creative Assignments, that is, presenting electronic educational materials for students to familiarize themselves with at home, giving instructions on how to use them, and ensuring that students come to the lesson with general knowledge, increases the effectiveness of the lesson.

Based on our research implementation program, it was intended to compile a statistical description of the formation of knowledge, skills and competencies in the subject of informatics and information technologies among students. This will allow us to assess the effectiveness of the use of Creative Tasks in teaching the subject of "Information Sciences and Information Technologies" in secondary schools.

The stage of determining the level of students' knowledge in the experimental and control groups and conducting a comparative analysis of the pedagogical experimental and test work on the topic of the research was carried out during the 2023-2024 academic year. A total of 50 students participated.

While the traditional method was used in the teaching process in the control classes, the experimental groups used Creative Tasks in teaching the subject "Informatics and Information Technologies". The results obtained at the beginning and end of the experiment in the control and experimental groups were systematically analyzed, compared with each other, and conclusions were drawn. The effectiveness of using creative tasks in teaching the subject "Informatics and Information Technologies" in the experimental group was theoretically substantiated and practically proven.

Based on the results of the experimental work using the method of mathematical statistics, conclusions were drawn about the effectiveness of students' assimilation of experimental materials. To determine the differences in the level of formation of knowledge and methods of action of students in these groups, we have compiled a statistical description of the results of the level of assimilation of educational material. Thus, it is possible to use such grades as unsatisfactory, satisfactory, good and excellent for the knowledge and skills of students in these groups. For this, as we showed above, we took two independent groups (the number of members in each group is also independent of each other) and selected them according to four criteria: unsatisfactory, satisfactory, good, and excellent.

In the conducted experimental work, the assessment of increasing the effectiveness of the teaching process was studied using the methods of mathematical statistical data processing of a number of

scientists and applied to the results of experimental tests.

Results and statistical analysis. The success of scientific research is determined by the degree of effectiveness of theoretical ideas in practical activities. Therefore, one of the important tasks of this research work is to develop a methodology for organizing and conducting experimental work, identify effective ways, methods and tools, determine the stages of the experiment, and ensure consistency and coherence between them.

In pedagogical research, the results obtained in control classes based on traditional methods are compared with the results obtained in experimental groups based on the use of creative tasks in teaching the subject "Informatics and Information Technologies", and the effectiveness of the results obtained in experimental groups is shown. Therefore, we used mathematical and statistical methods to verify the validity of the hypothesis chosen for the experimental work. The Chi-square test was chosen as one of the mathematical and statistical methods for processing the experimental results.

In this case, the hypothesis H0 assumes that the expected probabilities of the evaluation types in both (experimental and control) classes are equal ($p_{11}кр_{21}$, $p_{12}кр_{22}$, … $p_{1c}кр_{2c}$), and the alternative hypothesis H1 ($p_{11}\neq p_{21}$, $p_{12}\neq p_{22}$, … $p_{1c}\neq p_{2c}$) is taken. The $\chi 2$ criterion was used to test this statistical hypothesis. That is used this formula

$$T_{kuzatuv} = \frac{1}{n_1 n_2} \sum_{i=1}^{C} \frac{(n_1 O_{2i} - n_2 O_{1i})^2}{O_{1i} + O_{2i}}$$

In this context, the T statistical value, **n1** and **n2** represent the number of students in the control and experimental groups participating in the trial studies, respectively. **n1** is the number of students in the control group, and **n2** is the number of students in the experimental group. **O1** and **O2** refer to the number of grades (scores) obtained in the control and experimental groups, respectively. The obtained **T** value is compared with **Tcr**. If **T > Tcr**, then the null hypothesis (**H0**) is rejected and the alternative hypothesis (**H1**) is accepted.

Here, **Tcr** is determined based on the normalized deviation at a confidence probability of **p**. The degree of freedom is found using the formula **k×c – 1**,where **c** indicates the number of types of assessments. The **χ^2 (chi-square)** criterion is used because the experimental results were analyzed based on four types of assessments among the students in the selected control and experimental classes. Therefore, **c = 4**. If we take **p = 0.05**, then **k×c – 1 = 3**, and according to the chi-square table, **Tcr = 7.81**. To analyze the results of the research, calculations are carried out using the following formula: In order to determine whether the data obtained from the experimental studies is reliable, the **χ^2 (chi-square)** criterion is applied, where a hypothesis regarding the equality of mean values and its corresponding alternative hypothesis are considered.

During the experimental studies, control and experimental classes were selected by conducting a diagnostic test among 9th-grade students of School No. 15 in Chust district, Namangan region. The results obtained from the control test are presented in the following table.

Results of classses

Name of educational institution	Classes	Number of students	mark 5	mark 4	mark 3	mark 2	Efficiency
Secondary school No. 15 in Chust district, Namangan region	9-A	25	6	11	6	0	68%
	9-B	25	3	10	10	0	57%

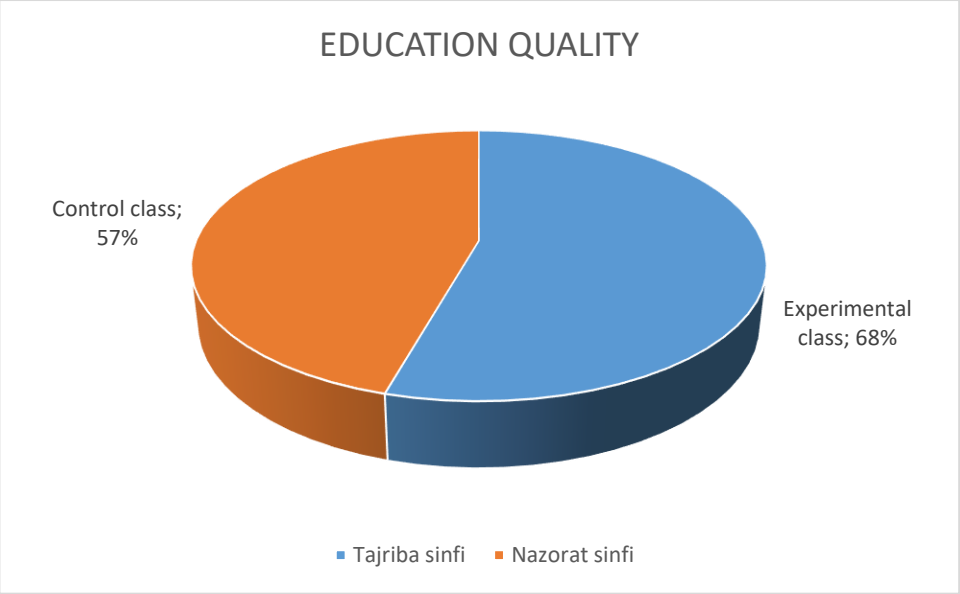
9th graders, grades 9-A and 9-B, were selected for practical and control classes in the subject "Informatics and Information Technologies". In the experimental group, classes were held on the basis of creative tasks in the subject "Informatics", created using creative tasks, and in the control group, using the traditional teaching method. In the experimental group, classes were held using the technical means of a computer, electronic boards, and creative tasks prepared in the classroom. In the control group, classes were held using the traditional teaching method. In the process of conducting experimental work, the content of teaching the subject, learning conditions, and methods were selected from 9th grade students, and questions and answers, results of pedagogical observation, and criteria for monitoring and evaluating students' knowledge were collected.

Results obtained at secondary school No. 15 in Chust district, Namangan region

Elections	5(excelent)	4(good)	3 (satisfactory)	2 (dissatisfied)	Number of students
Experimental group	O_{11}к7	O_{12}к12	O_{13}к6	O_{14}к0	n_2к25
Control group	O_{21}к4	O_{22}к10	O_{23}к11	O_{24}к0	n_1к25
	O_{11}+O_{21} к11	O_{12}+O_{22}к22	O_{13}+O_{23}к17	O_{14}+O_{24}к0	n_1+n_2 к50

$$T = \frac{1}{22 \cdot 23}\left(\frac{(23 \cdot 5 - 22 \cdot 2)^2}{7} + \frac{(23 \cdot 12 - 22 \cdot 6)^2}{18} + \frac{(23 \cdot 4 - 22 \cdot 13)^2}{17} + \frac{(23 \cdot 1 - 22 \cdot 2)^2}{3}\right) = 8{,}37$$

According to the above calculation, since Tк8,37> ,T_{kr}к7,81 the null hypothesis is rejected and the hypothesis H1 is accepted. It can be seen that the experimental tests conducted in the selected group are effective.



Dynamics of assessments. The analysis of the experimental results allowed us to draw the following conclusions. The use of creative tasks in teaching the general education subject "Informatics and Information Technologies" increased the ability of students to remember and retain comprehensive topics in a short time, to carry out practical exercises on them, that is, to master them. In this regard, it was proven that the effectiveness of education and the subject-specific competence formed in students increased by 1.16 times, or 16%, using mathematical statistical criteria.

Conclusion. The results of our research conducted within the framework of the problem of developing creativity in schoolchildren allowed us to draw the following conclusions, including:

1. It was proved that the teaching of computer science in general secondary schools does not create objective conditions that would allow the teaching of computer science to be carried out at the level of contemporary requirements (providing the process of teaching computer science with modern educational equipment, technical means, educational and methodological literature, subject program, textbooks, educational and methodological manuals, as well as visual aids).
2. It was found that the computer science teachers working in these educational institutions did not thoroughly master the basics of specialized subjects and pedagogical knowledge.
3. They did not have the skills to independently apply the acquired pedagogical knowledge in practice, they did not have the skills to work on themselves and organize creative activities, they did not have modern pedagogical technologies and their inability to effectively use them in the educational process.
4. It was found that educational institutions do not have a sufficient educational material and technical base, and it is necessary to develop a methodology for developing creativity in schoolchildren.

References:

O‘zbekiston Respublikasi qonun va qonun osti hujjatlari:

1. O‘zbekiston Respublikasi Prezidentining Farmoni, 05.10.2020 yildgi PF-6079-son https://lex.uz/ru/docs/-5030957
2. O‘zbekiston Respublikasi Vazirlar Mahkamasining qarori, 18.01.2021 yildagi 23-son. https://lex.uz/docs/-5234746
3. O‘zbekiston Respublikasi Prezidentining 2019-yil 8-oktyabrdagi “O‘zbekiston Respublikasi oliy ta’lim tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida”gi PF-5847-sonli farmoni.

4. Sh.Mirziyoyev 18.01.2022 y.dagi Maktab ta’limini rivojlantirish masalalari yuzasidan videoselektor yig‘ilishidagi nutqidan https://qalampir.uz/uz/news/darsliklarni-yangilashga-605-milliard-sum-azhratilmok-da-54398
5. O‘zbekiston Res.Prezidenti Sh.Mirziyoyevning “O‘qituvchi va murabbiylar kuni”ga bag‘ishlangan tantanali marosimdagi nutqidan.2020 yil 1 oktyabr. http://uza.uz/posts/3452

Books and series of publications:

1.1. Single volumes, monographs, textbooks:

1. Davronov, Z. (2007). *Ilmiy ijod metodologiyasi*. Toshkent: Iqtisod va moliya.

1. Ibragimova, G. N. (2017). *Oliy ta’lim tizimida interfaol texnologiyalar vositasida o‘quvchilardagi ijodiy fikrlashni rivojlantirish*. Zamonaviy ta’lim / Sovremennoye obrazovaniye, 4.
2. Ibragimova, G. N. (2016). *Interfaol o‘qitish metodlari va texnologiyalari asosida o‘quvchilarning kreativlik qobiliyatlarini rivojlantirish*. Toshkent: Fan va texnologiyalar.
3. Davurova, G. A. (2019). *Maktab o‘quvchilarining ijodiy faoliyatini shakllantirishda psixologik xizmatni tashkil etish. XXXVII Mejdunarodnaya nauchnaya konferensiya «Aktualniye vizovi sovremennoy nauki»*.
1. Xodjayev, B., & boshqalar. (2018). *Pedagogik tadqiqotlar metodologiyasi*. Toshkent: Iqtisodiyot dunyosi.
2. Abduqodirov, A., & Tursunov, S. Q. (2018). *Ta’limda axborot texnologiyalari*. Toshkent:

1.1. Multi-volume books:

1. Abdug‘aniev, R., & boshqalar. (2015). *O‘zbekiston milliy ensiklopediyasi* (1–12-jildlar). Toshkent: O‘zbekiston Milliy Ensiklopediyasi.
2. Karimov, I. A. (2017). *Asarlar to‘plami* (1–20-jildlar). Toshkent: O‘zbekiston Milliy Ensiklopediyasi.
3. Yuldashev, N., & boshqalar. (2020). *Axborot texnologiyalari rivojlanishi* (1–3-jildlar). Toshkent: Fan va texnologiyalar.
4. Dissertation and dissertation abstract:
5. Ibragimova, G. N. (2016). *Interfaol o‘qitish metodlari va texnologiyalari asosida o‘quvchilarning kreativlik qobiliyatlarini rivojlantirish*. (Pedagogika fanlari doktori dissertatsiyasi). Toshkent: O‘zbekiston Milliy universiteti.
6. Davurova, G. A. (2019). *Maktab o‘quvchilarining ijodiy faoliyatini shakllantirishda psixologik xizmatni tashkil etish*. (Psixologiya fanlari bo‘yicha falsafa doktori (PhD) dissertatsiyasi). Toshkent: O‘zbekiston davlat pedagogika universiteti.
7. Xodjayev, B. (2018). *Pedagogik tadqiqotlar metodologiyasining nazariy va amaliy asoslari*. (Pedagogika fanlari bo‘yicha falsafa doktori (PhD) dissertatsiyasi). Toshkent: O‘zbekiston davlat pedagogika universiteti.
8. Tojiboyeva, D. (2017). *Ta’lim jarayonida raqamli texnologiyalarni qo‘llashning pedagogik shart-sharoitlari*. (Pedagogika fanlari bo‘yicha falsafa doktori (PhD) dissertatsiyasi). Toshkent: O‘zbekiston davlat pedagogika universiteti.

Jurnallardagi maqolalarga havolalar:

1. Xodjayev, B. X. (2018). Kreativ ta’lim texnologiyalarining nazariy asoslari. Oliy ta’lim muammolari jurnali, №3, 45–60.
2. Ibragimova, G. N. (2017). Oliy ta’lim tizimida interfaol texnologiyalar vositasida o‘quvchilardagi ijodiy fikrlashni rivojlantirish. Zamonaviy ta’lim / Современное образование, 4.
3. Davurova, G. A. (2019). Maktab o‘quvchilarining ijodiy faoliyatini shakllantirishda psixologik xizmatni tashkil etish. XXXVII Международная научная конференция «Актуалние визови современной науки», 45–58.
4. Tursunov, S., & Ziyadullayev, D. (2016). Oliy ta’limda informatika fanlarini o‘qitish metodikasi. Ta’lim texnologiyalari jurnali, №2, 33–45.
5. Shoyimova, Sh. S., & boshqalar. (2020). Ta’lim texnologiyalari. IJODPRINT jurnali, №5, 12–25.
6. Abduqodirov, A., & Tursunov, S. Q. (2018). Ta’limda axborot texnologiyalari. Axborot texnologiyalari va ta’lim, №1, 21–35. '
7. Begimqulov Yu.T. Innovatsion texnologiyalar va kreativ ta’lim tizimi // Oliy ta’limdagi innovatsiyalar. — 2020. — №3. — B. 90-104.
8. Saidahmedov H.S. Kreativ yondashuvning ta’lim sifatiga ta’siri // Ilm va taraqqiyot jurnali. — 2019. — №2. — B. 48-57.
9. Tolipov O‘.Q. O‘quvchilarning kreativ qobiliyatlarini rivojlantirishning metodologik asoslari // Innovatsion ta’lim tadqiqotlari. — 2020. — №5. — B. 71-83.
10. Kruglova Yu.A. (2021) Kreativ pedagogikaning nazariy va amaliy jihatlari // Pedagogika va psixologiya jurnali. №2. — B. 55-65.

Ilmiy ishlar to‘plamlariga havolalar:

1. Xodjayev, B. X. (2018). Kreativ ta’lim texnologiyalarining nazariy asoslari. Oliy ta’lim muammolari jurnali, №3, 45–60.
2. Davurova, G. A. (2019). Maktab o‘quvchilarining ijodiy faoliyatini shakllantirishda psixologik xizmatni tashkil etish. XXXVII Mejdunarodnaya nauchnaya konferensiya «Aktualniye vizovi sovremennoy nauki», 45–58.
3. G‘anieva, U. R. (2017). Oliy ta’limda raqamli texnologiyalarni qo‘llash. Raqamli ta’lim va texnologiyalar xalqaro ilmiy-amaliy anjumani materiallari, 12–25.
4. Ibragimova, G. N. (2016). Interfaol o‘qitish metodlari asosida o‘quvchilarning kreativlik qobiliyatlarini rivojlantirish. Fan va texnologiyalar xalqaro ilmiy-amaliy konferensiya materiallari, 35–48.

Internet xavolalari

1. Inson taraqqiyoti bo‘yicha Milliy hisobot 2018. Onlayn manzilda http://hdr.undp.org/en/year/2018
2. Siyosat haqida qisqacha ma’lumot: Yoshlarning bandligini oshirish: asosiy mehnat ko‘nikmalarining ahamiyati. 2013. Onlayn: http://www.ilo.org/skills/pubs/WCMS_234467/lang--en/in dex.html
3. European Commission. Innovating Education and Creativity. Maqola: https://ec.europa.eu.
4. World Economic Forum. The Future of Creativity in Education. Maqola: https://www.weforum.org
5. Gómez, J. (n.d.). *Kompyuter fanlarida ijodkorlik*. **Samarali o‘qitish jurnali**, 7(1). Onlayn manba: https://uncw-edu.translate.goog/jet/articles/vol7_1/gomezabs.htm
6. Codelicious. (n.d.). *Kompyuter fanlarida ijodkorlik*. Onlayn manba: https://www.codelicious.com/blog/creativity-in-computer-science