**DOI** https://doi.org/10.58442/2218-7650-2023-26(55)-24-35
**UDC 372.851**

**Ture Aliyeva,**
PhD student from the Doctor of Philosophy program,
Teacher of Ganja State University.
Ganja, Azerbaijan.
https://orcid.org/0009-0008-7107-1128
*tureeliyeva@mail.ru*

# FORMATION OF CONTROL AND SELF-CONTROL SKILLS IN THE MATHEMATICS TRAINING OF YOUNG SCHOOLCHILDREN

**Abstract.** The subject of mathematics occupies an extremely important place among the subjects taught in general education schools, including primary classes. It is also possible to consider the amount of hours given to the study of this subject satisfactory. In order to effectively teach mathematics, build the learning process at a high level, and facilitate mastering, subject and class teachers in grades I–IV benefit from various methods and tools, guide the principles of training in their activities, and apply various methods. The formation of control and self-control skills in the mathematics training of young schoolchildren is one of the important conditions that increase the efficiency of the training process. Since mutual control is possible in the process of collective work, and at the same time, mutual control is the basis for the development of self-control, collective work becomes the most important form of organization of the learning process in which these skills are formed. Control and self-control applied at the initial stage of education helps to strengthen the acquired skills and habits of students. Not only the content of the teaching task, but also its purpose should be clear for the students. Students should know that their observation and attention skills are being tested. This will force students to direct their actions accordingly (or create conditions for the realization of this issue). Tasks given to students in the process of teaching mathematics help to form control and self-control by developing various characteristics related to personality (attention, observation, will, etc.) due to their specificity. The methodology of working on those tasks develops the characteristics necessary for the formation of control and self-control in students. By examining and monitoring the learning activities of their peers and teachers, students engage in analysis and summarization, which in turn leads them to self-examination and self-monitoring.

https://doi.org/10.58442/2218-7650-2023-26(55)

**Key words:** young schoolchildren; collective work; teaching; pupils; teaching mathematics.

## INTRODUCTION / ВСТУП

**Formulation of the problem**. The main goal of control and self-control in the educational process is to check and evaluate individual features of educational activity, analyze and connect the results obtained and finally, orient all educational activities in a purposeful direction. The development of students' skills of control and self-control contributes not only to the correct solution of educational problems, but also to their comprehensive development and the formation of personal qualities. The ability to control one's actions is one of the manifestations of individual independence which is necessary for the development of cognitive abilities.

Experimental research on the topic of the article was carried out at the Department of General Pedagogy of the Ganja State University of the Republic of Azerbaijan. First of all, according to our research the formation of skills should be started in the primary school. The study showed that the use of specially organized tasks and their systematic use in the classroom has effective results in the direction of the formation of control and self-control.

Some specially organized tasks for the development of control and self-control demonstrate in students qualities such as observation, concentration, willpower, dexterity, etc. that contribute to their development and aim at developing skills that are manifested through intensification. The use of this type of tasks most often occurs at the initial stage of the formation of skills – in the preparatory classes and the first grade.

Another part of specially organized tasks involves the development of control and self-control while improving the knowledge and skills already acquired, that is, correcting mistakes made by students in educational activities and preventing mistakes in the future.

At the initial stage of education, a 6-year-old child doesn’t possess features such as attention, will, observation, a critical approach to a task etc. Without these features, it is difficult to develop a child’s control and self-control skills. These features ensure the development and formation of control and the exact properties and skills that contribute to its activation. The tasks that we cited as an example allow you to develop and form those properties and skills that help activate control and self-control.

Forming in students certain skills of control and self-control, we direct them to improve other knowledge and skills which have already been acquired

https://doi.org/10.58442/2218-7650-2023-26(55)

by them. The main purpose of using tasks is to eliminate the gaps and shortcomings that students face in the learning process. Therefore, our work should be aimed at improving the skills and knowledge acquired by students. It also prevents mistakes in the implementation of educational activities.

**Analysis of major research and publications**. Psychologists also emphasize the great role of self-control in the education of trainees. From this point of view, professor R. Aliyev's views are interesting. According to the professor, it is necessary to teach a child to be critical of his actions, control his behavior, form his own opinion, be able to understand himself and the actions of other people and express a critical attitude towards them [3, p. 193].

Until recently, the functions of control and self-control in the learning activities of students were not clearly defined in pedagogical literature, especially in didactic literature, with the exception of individual methodological works, and their place and role in the entire educational process were not correctly defined. Only in recent years, as a result of the research made by teachers and psychologists (B. Gasanli, I. Dzhaibrailov, A. Abbasov) and the increased interest in the problems of educational work and in the pedagogical literature, it was possible to more or less clearly distinguish between monitoring and assessment and the role of control in the educational and cognitive activity of students [6], [7], [1].

The development of control and self-control in younger students is the most important educational task of a general education school. These skills help not only to enhance the educational and cognitive activity of students, but also to successfully complete the tasks associated with their upbringing. The issue of the formation of control and self-control in the educational activities of younger students requires special development, since at this stage of education the foundations for the formation of personal skills and abilities are laid.

## AIM AND TASKS / МЕТА ТА ЗАВДАННЯ

The ***purpose*** of the study is to determine the system of work, its capabilities, optimal ways and means of developing control and self-control skills in younger students in the course of educational activities.

The study includes the following ***tasks*****:** 1) Clarification of the functions of control and self-control in the educational activities of younger students; 2) Determination of pedagogical and psychological features of control and self-control in the educational activities of younger students; 3) Teaching the possibilities of control and self-control in the process of experimental learning based on meaningful assessments; 4) Development of a system of tasks and

https://doi.org/10.58442/2218-7650-2023-26(55)

methods of working with these tasks for the formation and development of control and self-control skills in younger students; 5) Organization, conduct and analysis of the results of experimental work on the formation of control and self-control in the process of educational activities of younger students.

## THE THEORETICAL BACKGROUNDS / ТЕОРЕТИЧНІ ОСНОВИ ДОСЛІДЖЕННЯ

The theoretical significance of the study lies in the fact that the identification of a system of work, optimal ways and means of forming control and self-control in the course of educational activities of younger students leads to further enrichment of the theory of didactics of primary education.

During the study, special attention was paid to the development of control and self-control in younger students by completing a number of tasks.

The first group of tasks included tasks which directly aimed at the formation of control and self-control, and these tasks were used in the preparatory and first grades, which are the initial stage in the formation of skills. Working with these tasks requires the development of students' will, attention, observation and intelligence, which are not yet sufficiently developed in children of this age. Therefore, the use of such tasks during the teaching process contributes to the development of abilities mentioned above.

Let us have a look at some tasks related to the development and formation of control and self-control skills in students of experimental classes, developed by us and used in the practice of experimental work in the first grades.

**Task 1.** Students are given a figure on the blackboard (figure 1).

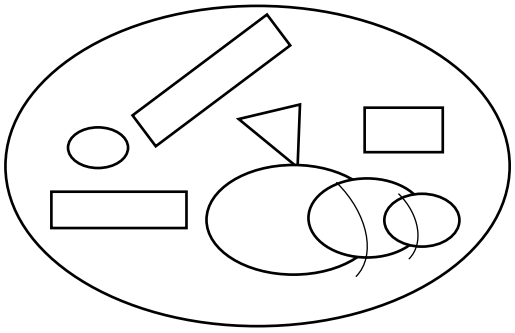

*Fig. 1 The picture develops attention*

They are asked to look through this picture. They have to answer the question: "How many circles are drawn here?" The student is expected to answer "four", ignoring the large circle. Thus, the teacher helps the student to

https://doi.org/10.58442/2218-7650-2023-26(55)

find the correct answer.

**Task 2.** A figure is drawn on the board (figure 2).

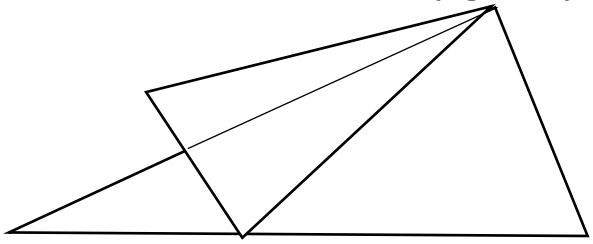

*Fig. 2 The picture develops thinking*

Having carefully examined the picture, students should say how many triangles are on it. Some students see two triangles in the picture, some three or five and some six. If the first student answers correctly, the task becomes meaningless for the rest, and they stop watching. The purpose of the assignment is to let everyone think, search and find the right answer.

In this case, it is necessary to resort to the "whisper in the ear" technique. The teacher then approaches the student, who raises his hand. The student quietly tells him the answer. The teacher approaches to all students one by one. Finally, after the teacher has asked the opinion of all the students, he asks one of them to answer aloud and point to each of the triangles on the board.

Asking questions in this way requires liveliness (activity). A minute or two is enough to get all the students' answers.

The following task is intended for preparatory and first grade students. Directly aimed at the formation of control and self-control. This task was prepared by us.

**Task 3.** A Christmas tree is drawn on the board, consisting of triangles of different sizes (figure 3).

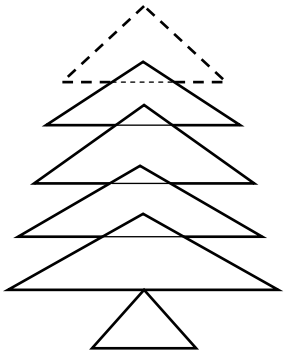

*Fig. 3 The picture develops control and self-control*

https://doi.org/10.58442/2218-7650-2023-26(55)

Students are asked to determine how many triangles the Christmas tree consists of. Most of them can see five triangles; some can see all eight. Students are asked: “Let's add another triangle to the Christmas tree (in the figure this triangle is marked with dotted lines). How many triangles will be added to the Christmas tree?

Answer: By adding one triangle to the Christmas tree, two triangles are added.

Thus, tasks serve as the initial stage in the formation of control and self-control skills in students of preparatory groups and first grade students. These tasks and the classes in which they are performed do not require any specific knowledge base or knowledge of the program material. They are designed to take advantage of the opportunities that students already have.

Among the tasks that serve the development of control and self-control in the conditions of improving the acquired skills and abilities, three types of tasks are differentiated. These tasks, which have a common goal, differ according to the means and forms of achieving this goal.

The first type of tasks asks students to find hidden mistakes in the text, about which the teacher doesn’t give any information beforehand. In practice the students focus on other type of mistakes, so they may not notice hidden mistakes. When working on these exercises, students are not asked in advance to look for mistakes. It is necessary to provide training that will help them activate the skills of independent control and self-control that will help them find mistakes. The creation of such an instruction, the activation of the skills of control and self-control in students does not happen by itself. This is the result of special work aimed at developing the formation of students' skills. Based on this work, as mentioned above, the student develops a critical attitude to the learning task, he blindly does not trust the information of the teacher, checks and controls himself.

**Work on assignments with hidden mistakes.** When working on assignments with hidden mistakes, the teacher turns to the class: “Guys, I make a mistake when solving an example, and therefore I can’t get the right answer and I can’t find my mistake. Let's solve this problem together." The teacher writes the task on the board:

$$\frac{(115 \times 3) - (90 : 6)}{(84 : 14) - 1}$$

Then he informs the students that the answer of the example is 66, but for some reason he gets 62. The teacher starts solving the problem on the

https://doi.org/10.58442/2218-7650-2023-26(55)

blackboard. He performs and explains each step of the calculation loudly:

1) 115x3=325;
2) 90:6=15;
3) 325-15=310;
4) 84:14=6;
5) 6-1=5;
6) 310:5=62

“See, the answer is wrong! – says the teacher. – There is probably a mistake in the example itself. What do you think?".

1) 115x3=345;
2) 90:6=15;
3) 345-15=330;
4) 84:14=6;
5) 6-1=5;
6) 330:5=66

Some students agree with the teacher and think that the example is really wrong. However, some students note that example is not wrong, but the solution is. There is a dispute. Then the teacher invites one of the students to the blackboard and asks him to solve the problem. The student corrects the "mistake" of the teacher and solves the problem correctly and gives an explanation with a loud voice:

The student says: "So, the answer is 66, which corresponds to the answer in the textbook." The teacher is “surprised” that he could not solve such a simple example and praises the students for solving the problem so carefully.

The method of work shown on the basis of tasks is quite effective. As a result of teamwork, cooperation and mutual assistance, students develop common ideas about a certain work, as well as honesty, courage, independence, and the ability to correctly express their opinions.

*The second type of task can be based on a "false instruction".* At this time, the teacher tries to confuse the students and give them "false instructions" about the mistakes in the text.

In this type of tasks, the teacher writes a text without any mistake on the board, but informs the students that there are some mistakes in the text that they need to find and correct. In another case, the text actually has fewer mistakes, but the teacher points out more and demands their correction; in the third case, although there are significantly more mistakes in the text, but the teacher focuses on fewer ones.

https://doi.org/10.58442/2218-7650-2023-26(55)

**Exercise 16.** Examples are written on the board. The students are given instructions: “Some mistakes were made while solving the examples. Find and correct them!".

(15*2) – (20:4)+(60+5) = 90;
(56:7) + (10*4) : (36:18) = 24;
(99-24) : (24:8) + (60-13) = 72

The indication is incorrect: the examples are solved correctly. In solving this problem, we resort to the same collective way of working.

Tasks using incorrect instructions are aimed at developing a critical attitude of the student to the teacher's instructions, which contributes to the activation of his control and self-control.

When working on assignments with hidden mistakes, the teacher sometimes doesn’t not pay attention to the mistakes, but directs the students' attention in other directions, which can be accompanied by a loss of control. In the tasks discussed above, he gives instructions that are completely opposite to the real situation. Such confusing instructions, quite the opposite of the real situation, require a particularly high level of control and self-control.

The materials of our experiments show that almost 95 % of students in the control classes uncritically follow incorrect instructions and find only the number of mistakes indicated in the task, consider that the task is completed and stop working.

The tasks that we present with incorrect questions are similar to the method of working on tasks based on the principle of hidden mistakes. For example, the teacher writes some text on the blackboard and says: “Children, read the text carefully. There are 5 mistakes. Find the mistakes and correct them!".

Students carefully read the text, notice mistakes and express a desire to correct them. The teacher calls the students one by one to the blackboard and they correct the mistakes. After the students have corrected five mistakes, the teacher addresses them: “Well, guys, you corrected all five mistakes in the text, now there are no more in the text.” "Another mistake in the text!" shouts one or more students with more advanced control skills. The teacher should be "surprised": "There were only five in the text, and you corrected them." The student shows the mistake on the board and corrects it. “You are right,” says the teacher, “there are six mistakes in the text. I thought there were only five of them, but I did not pay attention to the sixth.

Having found six errors in the text instead of five, students begin to

https://doi.org/10.58442/2218-7650-2023-26(55)

understand that the teacher can make mistakes and they think there may be other mistakes in the text as well. As soon as a critical attitude to the text is formed, students begin to carefully examine it and find two more mistakes. In this way, students discover and correct all seven mistakes. The teacher is "surprised" how he made these mistakes and did not pay attention to them. The teacher "justifies himself": "Apparently, I was in a hurry when copying and therefore made a mistake."

Thus, in the process of performing such tasks, the student gradually develops a critical attitude to the information given by teacher. The student gradually develops the idea that the teacher can also make mistakes. He believes that the teacher's information cannot be blindly trusted. The formation of such an attitude frees the student from the influence of the teacher and other external influences, directs and accustoms him to independent thinking and independent activity.

## RESEARCH METHODS / МЕТОДИ ДОСЛІДЖЕННЯ

The following methods were used in the research process: 1. Study and analysis of existing literature on the problem. 2. Observation. 3. Interview. 4. Conversation. 5. Questioning. 6. Pedagogical experiment. 7. Study, analysis and generalization of the experience of leading teachers in the formation of control and self-control skills in younger students.

The scientific novelty of the study lies in the fact that didactic foundations and methods, ways and means of developing control and self-control skills in younger students were involved in a serious study. The function of control and self-control in the educational activity of younger schoolchildren has been clarified, the features of control and self-control aimed at the learning process have been identified.

## RESEARCH RESULTS / РЕЗУЛЬТАТИ ДОСЛІДЖЕННЯ

In addition to these tasks based on hidden mistakes and false information, we present a third type of tasks, which we call provocative tasks. The texts of these tasks are constructed in such a way as to confuse the student not only with false information, but also with the help of various punctuation marks and signs – cells, circles, dashes. These conventional signs confuse the students, at the same time help them focus on one or another part of the task where they can make a mistake and determine the place of the mistake. These tasks were developed on the basis of educational material and taking into account frequent mistakes in the educational activities of students.

The teacher either "praises" the student who made a mistake and opposes

https://doi.org/10.58442/2218-7650-2023-26(55)

the class, or, conversely, “criticizes” the student who solved the problem correctly, thereby forcing the students to join the discussion. A business dispute, disagreement, a collective search for a solution to a problem – all this helps to achieve the goal. The purpose of the tasks prepared by us is to develop students' control and self-control in the process of collective work. All these tasks are completed on the board and the whole class participates in their implementation. In conditions of joint activity and cooperation, students collectively seek the right answer and the right solution to the problem, and it is this process of collective problem solving that contributes to the development of control and self-control. This kind of work gives the student the opportunity to control the learning activities performed by other students, analyze it and compare this activity with the plan or the result of their own actions.

## CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH / ВИСНОВКИ ТА ПЕРСПЕКТИВИ ПОДАЛЬШИХ ДОСЛІДЖЕНЬ

1. The definition of the system of work, its capabilities, optimal ways and means of forming control and self-control in the educational activities of younger students creates very favorable conditions for the integration of the Azerbaijani educational system into the advanced educational system of the world.
2. Educational work based on the synthesis of a collective and individual approach to younger students is the most effective means of developing their skills of control and self-control.
3. Special and purposefully organized educational activities for the formation of control and self-control skills in younger students have wide pedagogical, psychological and physiological possibilities.
4. The formation of control and self-control skills in younger students makes it possible to increase the effectiveness of the learning process in the primary grades and ensure its connection with real life.

**Prospects for further research in this direction**. For young schoolchildren under the influence of the teacher, the word of the teacher is important and indisputable. A teacher, in their opinion, cannot make a mistake or act wrongly. They believe the teacher’s each word and opinion, and accept any information without criticism.

## REFERENCES (TRANSLATED AND TRANSLITERATED) / СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

[1] A. N. Abbasov, L. A. Məmmədli, L. A. Əmirəliyeva, *Pedaqogika nəzəriyyəsi və tarixi*. Bakı, Azərbaycan: Nurlan, 2022.

[2] İ. İ. Əliyev, *İbtidai siniflərdə dərs zamanı şagirdlərin müstəqil işlərinin səmərəlilik şərtləri*. Bakı, Azərbaycan: Nurlan, 2007.
[3] R. İ. Əliyev, *Humanist psixologiya*. Bakı, Azərbaycan: ADPU-nun nəşriyyatı, 2023.
[4] T. Ə. Cəlilova, «İbtidai siniflərdə özünənəzarətin formalaşdırılması», elm. nam. dis. Bakı, 2014.
[5] N. M. Qəhrəmanova, C. S. Əsgərova, Riyaziyyat – 1. Bakı, Azərbaycan: Altun Kitab, 2010.
[6] B. A. Həsənli, «Təhsilin inkişafı strategiyası və müasir dərsin təşkili problemləri», *Azərbaycan məktəbi*, № 6, s. 57–63, 2014.
[7] İ. H. Cəbrayılov, H. H. Əhmədov, «Müasir təhsilin metodoloji problemləri: nə yeni baxış», *Azərbaycan müəllimi*, 13 aprel, s. 4, 2012.

## ФОРМУВАННЯ НАВИЧОК КОНТРОЛЮ ТА САМОКОНТРОЛЮ ПІД ЧАС НАВЧАННЯ МАТЕМАТИКИ МОЛОДШИХ ШКОЛЯРІВ

**Алієва Тура Алі,**
аспірант програми доктора філософії,
викладач Гянджинського державного університету.
Гянджа, Азербайджан.
https://orcid.org/0009-0008-7107-1128
*tureeliyeva@mail.ru*

**Анотація.** Надзвичайно важливе місце серед предметів, що викладаються в загальноосвітній школі, у тому числі в початкових класах, посідає предмет математика. Також можна вважати задовільною кількість годин, що відводиться на вивчення цього предмету. Для ефективного викладання математики, якісної побудови освітнього процесу та сприяння засвоєнню предмету, класні керівники I–IV класів використовують різноманітні методи та засоби, орієнтуються у своїй діяльності на принципи навчання, застосовують різноманітні методи. Формування навичок контролю і самоконтролю в математичній підготовці молодших школярів є однією з важливих умов підвищення ефективності освітнього процесу. Оскільки в процесі колективної роботи можливий взаємоконтроль, і в той же час взаємоконтроль є основою розвитку самоконтролю, колективна робота стає найважливішою формою організації освітнього процесу, в якій ці вміння формуються. Контроль і самоконтроль, що застосовуються на початковому етапі навчання, сприяє закріпленню набутих умінь і навичок учнів. Для учнів має бути зрозумілим не лише

https://doi.org/10.58442/2218-7650-2023-26(55)

зміст навчального завдання, а й його мета. Учні мають знати, що перевіряються їхні навички спостережливості та уваги. Це змусить учнів відповідно спрямовувати свої дії (або створювати умови для реалізації цього питання). Завдання, які ставляться перед учнями у процесі навчання математики, сприяють формуванню контролю і самоконтролю шляхом розвитку різноманітних властивостей особистості (уваги, спостережливості, волі тощо), що обумовлено їх специфікою. Методика роботи над цими завданнями розвиває властивості, необхідні для формування в учнів контролю та самоконтролю. Вивчаючи та контролюючи освітню діяльність своїх однолітків і вчителів, учні залучаються до аналізу та узагальнення, що, у свою чергу, веде їх до самоперевірки та самоконтролю.

**Ключові слова:** молодші школярі; колективна робота; навчання; учні; викладання математики.

**REFERENCES (TRANSLATED AND TRANSLITERATED)**

[1] A. N. Abbasov, L. A. Mammadli, L. A. Amiraliyeva, Theory and history of pedagogy. Baku, Azerbaijan: Nurlan, 2022.
[2] I. I. Aliyev, Efficiency conditions of students' independent work during lessons in primary classes. Baku, Azerbaijan: Nurlan, 2007.
[3] R. I. Aliyev, Humanistic psychology. Baku, Azerbaijan: ADPU publishing house, 2023.
[4] T. A. Jalilova, "Formation of self-control in primary classes", science. moist. dis. Baku, 2014.
[5] N. M. Kahramanova, C. S. Asgarova, Mathematics – 1. Baku, Azerbaijan: Altun Kitab, 2010.
[6] B. A. Hasanli, "Strategy of education development and problems of modern lesson organization", Azerbaijan School, No. 6, p. 57–63, 2014.
[7] I. H. Jabrayilov, H. H. Ahmadov, "Methodological problems of modern education: what a new view", Azerbaijan teacher, April 13, p. 4, 2012.

*Стаття надійшла до редакції*
*05 вересня 2023 року*