

## Problems of continuity in technological training of students in schools of the Russian federation

M.N. Rusin

**Abstract:** The article observes the issues of continuity of technological education of schoolchildren on the example of the intensive school "Engineering School in Yamal" in Noyabrsk in the 2020/2021 academic year. The experience of collaboration of educators, technology teachers and college teachers is presented.

**Keywords:** The exemplary educational program of basic general education; continuity; Concept; engineering school.

In the modern technological world, every production, starting with small businesses, needs highly qualified workers who can use modern high-tech equipment in their work. Starting from school, the state is called upon to train highly qualified specialists who will provide a technological breakthrough for the entire country in the future. This is exactly what the President of the Russian Federation V.V. Putin said at a meeting of the Presidential Council for Science and Education on June 23, 2014 in Moscow: "Today, the leaders of global development are those countries that are able to create breakthrough technologies and form their own powerful production base. The quality of engineering personnel is becoming one of the key factors in the competitiveness of the state and, which is fundamentally important, the basis for its technological, economic independence" [4].

Focusing on the goals and objectives of the concept of teaching the subject area "Technology", the school should pay special attention to teaching this subject. On February 4, 2020, the Federal Educational and Methodological Association for General Education approved, as amended on February 4, 2020, the exemplary educational program of basic general education [2].

One of the main tasks of this program for the formation of technological literacy is the creation of successive technological education system at all levels of general education. Together with this, the task is to modernize the content, methods and technologies of teaching the subject area "Technology", its material, technical and personnel support (including pedagogical education); strengthening the educational effect; study of elements of both traditional and the most promising technological directions [1].

The implementation of the program is possible at sites with a well-equipped material, technical and personnel base. However, when making up their own work programs, educational organizations should focus on those parts of the program (modules) that can be implemented at a high level independently (with the involvement of network interaction), and then gradually integrate the remaining parts into educational activities [3].

One of the main obstacles in the implementation of the Concept one can consider the absence of the subject "Technology" in the Federal State Educational Standard of secondary general education, which does not make it possible to ensure the continuity of the levels of general education, which is referred to in the Concept.

This problem is partially solved at the municipal level. So, in the city of Noyabrsk, within the framework of planned citywide events, it was decided to assist teachers in working with modern high-tech equipment. In the city of Noyabrsk an intensive school "Engineering School in Yamal" (hereinafter the School) on February, 24 – March, 6 2021 was held.

Three parallels of students took part in the work of the School: pupils of preschool educational institutions and students of grades 1-4, grades 5-6, grades 7-8. Preschoolers were trained in their institutions, 5 kindergartens were involved. The primary and secondary level was recruited from all schools in the city, 4-5 people in each parallel. Participants were selected independently by each institution. The work of each parallel differed in its intensity and filling of the group, as well as in the direction of professional activity. The students were divided into groups, depending on their age and will. To choose a direction, on the first day of the School's work, excursions to laboratories and professional tests on competencies were held. This opportunity was provided by the state budgetary professional educational institution of the Yamal-Nenets Autonomous Okrug "Noyabrsk college of professional and information technologies"(College). The students got acquainted with such areas of professional activity as mechatronics, mobile robotics, web design and mobile application development, IT solutions for business on the 1C platform, CAD engineering design, graphic design. After conducting master classes and demonstration performances, groups were formed according to directions.

One of the main innovations in the work of the School was that preschoolers and primary school students were equally involved with junior students. The training sessions for them, in contrast to the older ones, were conducted in the form of games and master classes. For preschoolers, classes were held locally, both kindergarten representatives and teachers from city schools were involved in the work. On the basis of the institution of additional education "Center for Intellectual Development of Juventa", classes were held for primary school students. At the end of the training, the results of the work were summarized in the form of a Cuboro mini-relay among children 5-7 years old, a cartoon festival among the parallels of grades 1-2 and 3-4 and an exhibition of creative works performed during the participation in the work of the School.

Groups of students in grades 5-6 were organized to study 3D modeling, a CNC sewing machine, electrical engineering with programming elements, smart home, and a laser engraving machine. The training took place on the basis of Secondary School № 6, which is one of the three key schools for the development of physics, mathematics and IT education in the Yamalo-Nenets Autonomous Okrug. Teachers from different schools of the city conducted the classes. Teachers of technology, computer science and physics were involved into the activity. Each of them contributed to the work of the School, focusing on their knowledge and skills.

Junior students had the most interesting and long-lasting classes. After choosing the direction, their studies continued on the basis of college and narrow experts were engaged in the activity. College teachers conducted the training, each on his own specialization. Unlike the school, where classes for grades 5-6 were held in classrooms, specialized laboratories were provided for conducting training sessions. The equipment used for the training was absolutely modern and perfect. In addition to practical classes and workshops in the end of the day the meetings with interesting people (successful college students, engineers from city-forming enterprises of the city, programmers, participants and organizers of WorldSkills competitions) were organized for more motivated learning. There in friendly atmosphere students could ask the guests any question and get a detailed answer from a specialist in their field.

At the end of the work of Engineering School a survey was conducted among the students. The results show that the organization and work of the School was organized at a high level. More than 93% of the participants expressed their intention to continue studies next year. About 17% would like to change the direction of studies, all the rest decided to continue their studies without changing their focus.

Continuity plays a great role in the work of teachers who took part in teaching all age groups. Unlike college teachers, who specialize in one area, school teachers, supplementary education teachers and kindergarten teachers are universal specialists. They cannot give their students sufficient deep knowledge of a specific discipline in their subject area. At the same time, they can provide an influx of motivated students and applicants to schools and secondary educational institutions in a specific direction. Collaborating, institutions of different levels contribute to solving many tasks of technology education set by the state. It is known that for the effective implementation of the main tasks of the Concept of teaching the subject area "Technology" it is necessary to use the resources of organizations of supplementary

education, centres for technological support of education, children's technoparks, etc. [1]. Thus, thanks to the professional cooperation of a kindergarten, an institution of supplementary education, a school and a college, one of the main tasks of the Concept is being implemented, namely, the emergence of a system of continuity of technological education at all stages of general education.

**Bibliographic list:**

1. The Concept of teaching the subject area "Technology" in educational organizations of the Russian Federation, implementing the main educational programs [Electronic resource]. URL: <https://docs.edu.gov.ru/document/c4d7feb359d9563f114aea8106c9a2aa/> (date of access: 09/01/2021).

2. The exemplary educational program of basic general education [Electronic resource]: approved by the FUMO Decision on General Education, Protocol No. 1/20 (as amended on 02/04/2020). URL: [https://fgosreestr.ru/registry/%D0%BF%D0%BE%D0%BE%D0%BF\\_%D0%BE%D0%BE%D0%BE\\_06-02-2020/](https://fgosreestr.ru/registry/%D0%BF%D0%BE%D0%BE%D0%BF_%D0%BE%D0%BE%D0%BE_06-02-2020/) (date of access : 09/01/2021).

3. Khotuntsev Yu. L. Technological education of schoolchildren in the Russian Federation in 2019–2020 // Modern technological education: a collection of articles, reports and materials of the XXVI International Scientific and Practical Conference, November 23–24, 2020, Moscow / under ed. Yu. L. Khotuntseva, V. K. Baltyana. M.: MPGU: MSTU im. N.E.Bauman, 2020.290 p.

4. Shorthand report on the meeting of the Council for Science and Education chaired by Vladimir Putin on June 23, 2014 in Moscow [Electronic resource]. URL: <http://kremlin.ru/events/president/news/45962> (date of access: 01.09.2021).