

## Technological Education of Schoolchildren in the Russian Federation Currently

Yu.L.Khotuntsev

**Annotation.** The principles of the technological education of schoolchildren in the Russian Federation and the problems of the implementation of this education, taking into account the instructions of the President of the Russian Federation V.V. Putin and the latest directives of the Ministry of Education of the Russian Federation are described.

**Key terms:** Technological education, Federal state educational standards, approximate basic educational program of general education, orders of the Minister of Education of the Russian Federation, instructions of the President of the Russian Federation.

Subject area (subject) "Technology" was introduced in the basic curriculum of educational institutions of the Russian Federation in 1993 by order of the Minister of Education of the Russian Federation. There is an eleven-year school in the Russian Federation. The study "Technology" was allocated for 2 hours a week from 1 to 7, in 9,10 and 11 grades and 3 hours a week in 8 and 9 grades. It was supposed to study drawing at the complementary hours in grades 8 and 9. The conception and program of educational institutions "Technology" «Technology. Labor training. 1-4, 5-11 classes» (scientific leaders Yu. L. Khotuntsev and V.D. Simonenko) have been developed. This program have been published from 1996 to 2010 with a total circulation of more than 170 thousand copies. Technology textbooks and other teaching materials have been published.

In accordance with this program, all students from 2nd to 11th grades in the fourth quarter of the school year carried out individual or collective creative projects - small independent creative (containing new solutions) completed works performed with the consultations of the teacher. 75 % of study time was allocated for practical work, 25% for the study of the theory. In the city school, technological training of schoolchildren was carried out in two directions: "Technique and Technical Creativity" (Industrial technologies) and "Culture of home and decorative and applied creativity" (Technology of service). In the first direction, manual and mechanical (on the machine) machining of wood and metal, as well as electrical engineering and electronics were studied in depth. In the second direction, the working with materials and foodstuffs and multiple electrical engineering were studied in depth too. In both directions schoolchildren has been studied: the use of information technologies for solving of technological problems of transformation materials and energy, drawing and guidance courses. In the rural school they further studied the issues of agricultural production. For technological training in most schools workshops of woodworking and metalworking, processing of material and food were created. For students in those schools where it is not possible to create workshops educational and production plants were created.

Since 1994, scientific-practical conferences on technological education for technology teachers and university professors, as well as technology teachers days have been held annually in various cities of the country.

Since 2000, the All-Russian School Olympiad has been held annually in technology, which includes three components: 1) Testing (25 tests in various sections of the Technology program) and a creative task — a theoretical description of the process of manufacturing a simple product; 2) Practical work on the choice of woodworking, metalworking, electrical engineering, robotics, 3D-prototyping, etc ; 3) Presentation of creative projects.

The Olympiad contains 4 stages: school stage for students of 5-11grades; municipal (city), in which

the winners of the school stage 7-11 classes participate; regional, in which the winners of the municipal stage of 9-11 classes participate and the final stage, in which the winners of the regional stage of 9-11 classes take part in.

In subsequent Basic curricula, the number of hours spent on "Technology" exercise was reduced. In the last Basic curriculum of educational institutions of the Russian Federation for the study of "Technology" allocated 1 hour per week in elementary school from 1 to 4 class, 2 hours per week in 5,6,7 classes and 1 hour per week in the 8th grade. In the senior grades 10 and 11, It was allocated 1 hour per week in the basic school and 4 hours per week in the specialized school. In carrying out studies on " Technology" the division of classes is made into two groups in urban educational institutions with 25 or more people, in rural with 20 or more people.

In 2010, the Federal State educational standards of primary, basic general and secondary (complete) general education were published.

In the Federal State Educational Standard of elementary general education, when studying "Technology", it was intended to use acquired knowledge and skills to creatively solve of simple design, artistic and design, technological and organizational tasks, and to perform educational and project design artistic tasks.

In the Federal State Educational Standard of basic general education , it was noted that the study of "Technology" should provide : 1) Mastering the methods of teaching , research and project activities, solving creative problems, modeling, designing and aesthetic design of products ; 2) Mastering the means and forms of graphical display of objects or processes, the rules for performing graphical documentation ; 3) The ability to apply technologies of representation, projection and use of information ; 4) Formation of ideas about the world of professions, their relevance in the labour market.

In the Federal State Educational Standard secondary (complete) general education noted that in the curriculum «Technology » can be included for selection of students in line with the characteristics and capabilities of the educational institution.

In April 2015, by the decision of the Federal Educational and Methodological Association for General Education, the Approximate Basic Educational Program of General Education was approved. It says The subject area "Technology" is a necessary component of the general education of all schoolchildren, giving them the opportunity to put into practice the knowledge of the fundamentals of science. This is actually the only school curriculum that reflects in its content the general principles of transformative human activity and all aspects of material culture. It is aimed for the students learning the skills of a particular subject-transformative (and not virtual) activity, the creation of new values, which undoubtedly corresponds to the needs of the development of society. As part of the "Technology" is an acquaintance with the world of professions and the orientation of schoolchildren to work in various spheres of social production. This ensures the continuity of the transition of students from general to vocational education and work.

The program of the subject "Technology" ensures the formation of technological thinking among schoolchildren. The technological thinking scheme (need - goal - way - result) allows to most organically solve the problems of establishing links between educational and living space, educational results obtained in studying various subject areas, as well as their own educational results (knowledge, skills, universal learning activities and etc.) and life tasks. In addition, the scheme of technological thinking allows to enter into the educational process situations that give the experience of making pragmatic decisions based on their own educational results, ranging from solving everyday issues and ending with a decision on the directions of continuing education, building career and life plans. Thus, the subject area "Technology" allows students to form a resource of practical skills and experience necessary for the rational organization of their own lives, creates the conditions for the development of initiative, ingenuity, flexibility of thinking.

The subject of "Technology" is the basis on which the project thinking of students can be formed.

Program objectives:

- 1.Ensuring students understanding the essence of modern material, information and humanitarian technologies and their development prospects.
- 2.The Formation of technological culture and project-technological thinking of students.
- 3.The Formation of the informative base and personal experience necessary for the students to determine the directions of their further education in the context of the construction of life plans, primarily relating to the scope and content of future professional activities.

The program is implemented at the rate of 2 hours per week in grades 5-7, 1 hour - in grade 8, in grade 9 - due to the variable part of the curriculum and extracurricular activities.

The main part of the content of the program is the activity of students, aimed at the creation and transformation of both material and information objects. The most important group of educational results is the practical experience gained and meaningful by the students. It is assumed to acquaint with 22 technologies.

In accordance with this program, new lines of technology textbooks were prepared.

On March 30, 2016, the Minister of Education and Science of the Russian Federation signed Order No. 336 "On approval of the list of training and education facilities required for the implementation of educational programs of primary, general, basic general and secondary education"; in the section "Modern technological development environment", in module 19 "Technology Cabinet" includes:

Part 1. Housekeeping (cutting and sewing).

Part 2. Housekeeping (cooking).

Part 3. Plumbing. (which includes: machine for metal, vertical milling machine, drilling machine)

Part 4. Joinery. (which includes: woodworking lathe, grinding machine).

Part 5. Universal workshop technology working with wood, metal and design work of schoolchildren, which includes: CNC vertical milling machine, CNC lathe machine for metal, designer of modular metalworking machines for metal, resource kit for modular machine constructor, set numerical program control for the designer of modular machines, laser cutting machine, CNC milling and graphing machine, etc.

For specialized classes, the list includes:

Part 1. Profile engineering and technology class:

the engineering graphics laboratory;

the laboratory of 3 D- modeling and prototyping;

educational modules for the study of robotics.

On May 4, 2016, the President of the Russian Federation V.V. Putin sent an instruction to the Minister of Education and Science of the Russian Federation D.V. Livanov and others: "In order to shape students' skills in design and research activities, submit, in the prescribed manner, proposals for improving teaching in general educational institutions of the "Technology" subject, including improving the material and technical support and staffing of the educational process, as well as within the framework of the All-Russian Olympiad of schoolchildren in this subject the organization of competition of project works of students".

In accordance with the instruction of the President of the Russian Federation V. V. Putin, the Ministry of Education of the Russian Federation established a working group to develop a concept for the teaching of the subject "Technology".

On May 6, 2018, the President of the Russian Federation, Vladimir Putin, signed the Order "On the National Objectives and Strategic Objectives of the Russian Federation for the Period until 2024", which stated in particular: the fact that in 2024 it is necessary to provide: ... an update of the content and improvement of teaching methods in the subject area "Technology".

On December 30, 2018 on the portal of the Ministry of Education of the Russian Federation an

approved concept was published of how to teach the subject area "Technology" in educational institutions of the Russian Federation, implementing the main educational programs. [1]

The Concept notes: 1) The importance of material technologies for the transformation of materials and energy; 2) The possibility of variable teaching; 3) The importance of project teaching method; 4) The feasibility of restoring training and production plants, practically eliminated by now.

The disadvantages of the Concept developed by information technology specialists are:

- 1) The overwhelming influence of information technology. But information technologies are one of the tools for solving problems of material technologies;
- 2) Continuous orientation to the criteria of the competition of blue-colour occupations of Worldskills. But the subject area "Technology" is preparing students for the choice of various professions and not only workers;
- 3) The absence of references to the general principles of transformative, technological activity and reproduction education, which is the basis for the project activities of students. Without reproductive learning project execution is impossible.

To fulfill the Order of the President of the Russian Federation V.V. Putin's on May 4, 2016, the Ministry of Education of the Russian Federation plans, in particular:

- 1) Finalize the Federal State Educational Standards of General Education and the approximate basic educational programs;
- 2) Develop and test a tentative list of equipment and recommendations for the formation of functional areas of educational activities on technology;
- 3) To provide support to the subjects of the Russian Federation developing a targeted technology teacher training program;
- 4) Increase the proportion of teachers trained in updated advanced training programs in the field of "Technology";
- 5) To create in rural areas and small towns a material and technical base of collective use centers for the implementation of educational programs of digital and humanitarian education profiles, including technology.

#### Literature

1. [http://docs/edu/gov/ru/document/c4d7feb359d9563f114\\_aea8106c9a2aa/?fbclid=IwA...](http://docs/edu/gov/ru/document/c4d7feb359d9563f114_aea8106c9a2aa/?fbclid=IwA...)