Teaching Talented Children and their Orientation for Building a Successful Career in the Field of Science and High Technologies

S.S. Neustroev[1,a*]

[1] Institute of Education Management of the Russian Academy of Education, 16 Zhukovsky str., 105062, Moscow, Russia

[a] uprstrateg@yandex.ru

* Corresponding author

Keywords: education of talented children, school project office, intellectual potential of the country, programs of additional education, network of regional schools, state support of schools

Abstract: In order to implement the National Project "Education" in terms of ensuring the global competitiveness of Russian education, the entry of the Russian Federation among the 10 leading countries of the world in terms of the quality of general education and upbringing of a harmoniously developed and socially responsible person based on the spiritual and moral values of the peoples of the Russian Federation, historical and national-cultural traditions, and the Strategy of scientific and technological development of the Russian Federation in terms of creating opportunities to identify talented young people and build a successful career in science, technology, and innovation. To develop a modern system of scientific and technical creativity of children and youth, it is necessary to create favorable conditions in the regions for identifying and teaching talented children, for in-depth mastering of certain subjects, orienting schoolchildren to build a successful career in science and high technology.

1. Introduction

In accordance with the Strategy for the Scientific and Technological Development of the Russian Federation, the goal of the scientific and technological development of the Russian Federation is to ensure the independence and competitiveness of the country by creating an effective system for building up and making the most of the intellectual potential of the nation. To achieve the goal of the scientific and technological development of the Russian Federation, opportunities must be created to identify talented youth and build a successful career in the field of science, technology and innovation, thereby ensuring the development of the intellectual potential of the country [8].

In addition, in the Decree of the President of the Russian Federation of May 7, 2018 No. 204, the following tasks are among the main: introducing at the levels of the basic general and secondary general education new methods of teaching and upbringing, educational technologies that provide students with mastering the basic skills and abilities, increasing their motivation for learning and involvement in the educational process; formation of an effective system of identifying, supporting and developing abilities and talents in children and young people, based on the principles of justice, universality and aimed at self-determination and professional orientation of all students [9].

2. Materials and Methods

The author used the following methods in the article: theoretical analysis (analysis of professional standards, methodological manuals and recommendations, generalization of pedagogical experience).

3. Results

The creation of a network of regional schools under the patronage of large regional universities and research institutes (the Research School) can become one of the effective mechanisms for identifying talented children and targeting schoolchildren to build a successful career in science and high technology [1]. Operating under the auspices of universities and research institutes, such schools will build an effective system for identifying, supporting and developing abilities and talents in children from the elementary school level.

The Research School should be an integrated innovative educational and scientific complex, which profile is determined by a set of structural subdivisions that carry out training and orientation of schoolchildren to be involved in scientific research in priority areas in the framework of programs for the socio-economic development of regions [5, 7].

Important distinguishing features of the Research School are:

- Regional executive authorities act as founder;
- In-depth study of individual subjects (profile);
- Scientific and methodological links with regional universities and research institutes;
- Experimental teaching methods and educational technologies, thanks to which learners master skills and abilities above basic in subject areas.

Realizing this mission, the Research School can coordinate other general educational organizations and organizations of additional education in the region in its profile. Schoolchildren should join the research in the framework of the implementation of basic educational programs in subjects, the in-depth study of which determines the profile of the Research School. In addition, classes and activities in the framework of additional education on the profile of the Research School should be carried out at the expense of state funding. In aggregate, this will allow for the realization of an "individual trajectory" of each student at the Research School.

Below, we will try to reveal the proposed mechanism for the creation and operation of the Research School.

3.1. State Support and Public-Private Partnership

State support of Research Schools is carried out within the framework of developing a number of programs approved by the Russian Academy of Sciences and the Ministry of Enlightenment of the Russian Federation, which are providing conditions for implementation and criteria for evaluating the effectiveness of the educational process, the integration of educational and research activities, the modernization and improvement of the material and technical base, the involvement of highly qualified teaching staff.

The means of state support for the development of Research Schools can be used to modernize the educational process (equip with modern educational and methodological complexes), modernize the research process and innovation activity (equip with specialized equipment), develop personnel potential, and improve infrastructure.

Additional sources of state support for the Research Schools include establishing special standards for the maintenance of their current activities, the participation of business entities in the formation of funds, the priority inclusion of the objects of Research Schools in the list of capital construction projects financed in full or in part from regional budgets.

Heads of the constituent entities of the Russian Federation should have a special role in the strategic development of Research Schools and the implementation of relevant programs. Under their patronage, we can most effectively address the development of the Research Schools and their activities in close connection with the solution of the tasks of socio-economic development of the subjects of the Russian Federation.

The use of the public-private partnership mechanism will allow the Research Schools to receive additional financial investments in the form of donations to endowments, development funds, and other funds, which are aimed at the development of educational organizations, grant educational programs, etc.

3.2. Content of Education in Research Schools

Fulfillment of tasks assigned to Research Schools is impossible without focusing on the formation of actual educational content (general and secondary), which should correspond to the tasks that are laid down in the status of the Research School, as well as teaching methods, educational technologies that promote the development of skills and skills in subject areas over basic.

1. The development of an exemplary educational program of the Research School is appropriate. The unique content and forms of education in the educational organization of a similar status will be reflected in it. Such a program should consolidate the "fundamental core" of such content: the invariant composition of

training courses, which, on the one hand, would conceptually reflect the idea of the basics of modern fundamental education and, on the other hand, allow creating a kind of intellectual general context for students in Research Schools. The variable part of the educational program of the Research School in each case will be unique and reflect the individual profile, which is determined by the set of structural units providing training and orientation of schoolchildren to be involved in research in priority areas within the programs of socio-economic development of the respective regions. The educational program of the Research School will reflect all levels of study (basic, core, level of additional education). Moreover, universities, research institutes and employers should take an active part in filling the core content of training in the Support School, with methodological support for the development of educational programs of relevant specialists (Fig. 1):

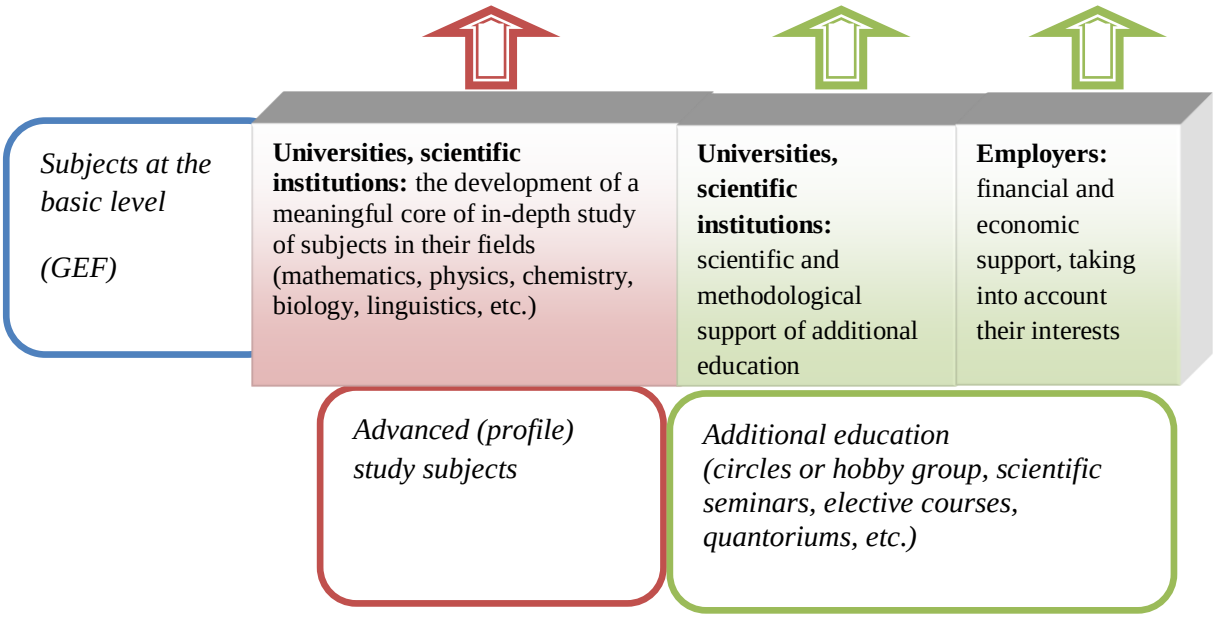

Fig. 1. The content of education and methodological support in research schools.

The educational program of Research Schools should provide for compulsory in-depth study of 2 foreign languages, taking into account the profile: English from the grade 1; a foreign language from the grade 5 of a partner country that is a leader in priority sectors for the region, taking into account traditional socio-economic and cultural relations, the development strategy of the territories of the constituent entity (for example, Chinese, Korean, Indian, or Scandinavian languages, etc.).

2. The Research Schools should be connected by a unique network with several goals:

– Localization of a unique educational space, resources (meaningful content of profile education of Research Schools, human resources, etc.).

– Creating a unique open social network where full-fledged support of projects (scientific, practical, etc.) is carried out through joint work with mentors and supervisors, experts and consultants (including from future employers). Such a network will become a digital tool designed to help implement the ideas of schoolchildren, college and university students, graduate students and scientists, young entrepreneurs, startup developers. With the help of a complex of special services, users are able to record all the stages of work on projects, demonstrate the results obtained, and take part in contests and events.

The Research Schools must take part in all international studies on the evaluation of the quality of education (PISA, TIMSS, and others).

For the formation of the prestige of Research Schools and their graduates, the Ministry of Science and Higher Education of the Russian Federation must provide special conditions for graduates, such as additional points to the results of the USE for admission to specialized universities in the region, social benefits (providing hostels, increased scholarship, scientific and educational internships, etc.).

Regular international competitions and contests should be held under the auspices of the Russian Academy of Sciences among students of the Research Schools and students from partner countries that are world leaders

in the basic sectors of the economy being strategically important for Russia. The practice of such events will help to identify the most talented students of Research Schools, create conditions for their further development (educational grants, internships, etc.), and enhance the prestige of Russian education.

The research school is an integrated innovative educational and scientific complex. It should provide an opportunity for training gifted children from all municipalities of the region, including through the residential form of education by creating the necessary infrastructure, as well as organizing a year-round stay for students. It is also advisable to provide for the possibility of living for teachers who may come for a series of lectures and/or classes at the Research School from different regions of Russia or from foreign countries (by invitation).

In the summer, on the basis of the Research Schools, international schools (internships) can be held with the participation of students from the partner countries of the region and students from educational institutions in the region where the Research School coordinates its profile. Also on the basis of the Research School, internship sites can function for students, graduate students, teachers (school teachers).

3.3. Staffing

Attraction of highly qualified teachers is possible in several forms:

1. At the first stage, the creation of the All-Russian database of highly qualified school teachers, university professors, scientists, representatives of production and business, who are capable and ready for educational activities in Research Schools (in various forms).
2. At the first stage, the development and implementation of advanced training programs for teachers, university lecturers and other involved specialists, who would participate in the implementation of educational programs of the Research Schools.
3. At the second stage, the development and implementation of the master's program (such as “Teacher of the research school”) in the educational programs of specialized educational institutions of higher education; the preparation of the necessary number of specialists for the formation and development of supporting schools. Such programs should be developed and implemented for school psychologists (“Psychologist of the supporting school”) in order to prevent psychological problems that arise among children who are considered talented and gifted, as well as those that arise in high schools.
4. In the future, the completion of the professional standard of the teacher in terms of the requirements for the teacher of the Research School.
5. In the future, development of a system for attracting highly qualified school teachers, university lecturers, scientists, representatives of production and business to work in the system of the Russian Research Schools. This should be full-time and part-time (remote) participation. Full-time includes lessons, lectures, forms of additional education, elective courses, counseling, expert support, tutoring, support for vocational guidance and scientific work (group and individual), personal mentoring etc. Part-time participation implies everything is the same with regard to distance technologies, including interactive mode.
6. Starting from high school, each student has a mentor from among employees of regional universities or research institutes.

3.4. Organization of Support Schools Activities

To provide methodological, consulting, and legal support for the activities of Research Schools, it is necessary to create a Federal Project Office for Cooperation with the Research Schools. Tasks of the office: developing model documents, regulation; organizing methodological support of the educational process in Research Schools; working with teaching staff, etc.

Openness of the work of Research Schools, the possibility of public control and public discussion of the effectiveness of the implementation of educational programs at all stages (including the selection stage, the achievement of intermediate results, etc.) should be ensured.

During the period of development programs, the material and technical base of educational and scientific activities, the content and technologies of education, the qualifications of the teaching staff should be brought to a qualitatively new level comparable to the international.

4. Conclusion

For the organization of a competent procedure for the selection of children in the Research Schools, a toolkit should be created that contains reasonable and adequate criteria for assessing children's giftedness at all stages of education, starting from the initial (attracting leading psychologists, sociologists, taking into account domestic and foreign experience) [2, 3, 6]. It is advisable to provide "points of entry" for talented children to the Research School at any stage of education (based on portfolios, exams, tests, etc., taking into account the requirements of the legislation) [4].

Changes need to be made to the regulatory legal acts defining the regulatory costs for the provision of state (municipal) services in the field of education. These regulations are applied when calculating the number of subsidies for financial support for the implementation of state (municipal) tasks for the provision of state (municipal) services (performance of work) by a state (municipal) institution, by increasing the basic standard and auxiliary coefficients for the Research Schools. In addition, the legal framework for the provision of state subsidies for the implementation of additional education programs in the Research Schools should be worked out.

5. Acknowledgement

This research has been conducted with the financial support of the Ministry of Enlightenment of the Russian Federation (grant No. 073-00089-19-01 for 2019).

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