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SOCIAL IMPORTANCE OF SCIENTIFIC AND EDUCATIONAL PROJECTS IN THE MODERN YOUTH ENVIRONMENT

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Abstract

The article describes the new approach to designing educational projects of additional education in the modern youth environment. The most important result of the project is the creation of unique copyright materials aimed at early career guidance of schoolchildren, the development of youth scientific and technical creativity and the involvement of adolescents in research activities, the construction of a continuous chain of high-quality professional education in the interests of high-tech industrial enterprises of the country. The project made it possible to increase the prestige of engineering specialties, arouse the desire for creative activity among young people, and form the participants' interest in such important industries as astronautics and the rocket and space industry. A single team created during the project, which united schoolchildren, students of technical colleges, students of technical universities, cosmonauts, workers and veterans of the rocket and space industry to transfer experience and knowledge, made it possible to create a continuous system of additional professional education in the field of astronautics, to attract young people to research activities, to solve the problem of involving and retaining personnel for high-tech enterprises of the Krasnoyarsk Territory.

Keywords: Social project, additional education, modern youth environment

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1. Introduction

The analysis of the social significance of project activities in the modern youth environment is based on the experience of implementing the Small Space Odyssey project. This is a career guidance project aimed at developing the scientific and technical creativity of schoolchildren and junior students in the field of astronautics and rocket technology through their involvement in educational, research, inventive and design activities under the guidance of a volunteer mentoring community (Kovalev et al., 2020a). The project was implemented in the Krasnoyarsk Territory by the public institution "Krasnoyarsk Regional House of Science and Technology of the Russian Union of Scientific and Engineering Public Associations" using the grant of the President of the Russian Federation for the development of civil society provided by the Presidential Grants Fund. The author of the project is the pilot-cosmonaut, Hero of Russia A.I. Lazutkin.

The project is based on the development of unique teaching materials for additional education for schoolchildren and students in the field of astronautics and rocket and space technology, the organization of project-team work and youth research in this area. During the implementation of the project, the participants study materials on the history of domestic cosmonautics, the formation and development of the rocket and space industry and high-tech production in the Krasnoyarsk Territory and the Russian Federation, receive additional knowledge in physics, chemistry, astronomy, geometry, physical education and sports training, ecology, geography, local history , which they will need to carry out design and research work in the field of cosmonautics, get acquainted with the profession of "cosmonaut" and related specialties.

The on-line platform of the project with a virtual "Space laboratory", contains training and competition tasks for project participants, the results of their research, creative projects, rating of achievements, photo and video materials of the project, broadcasts of rocket launches, recordings of webinars and meetings with cosmonauts, lectures by teachers from leading universities on the topic of the project.

The Krasnoyarsk Science and Technology City Hall has equipped an auditorium for organizing meetings of young people with pilots-cosmonauts of the Russian Federation and veterans of the rocket and space industry, for conducting open lectures on the topic of the project for everyone with a recording and subsequent broadcast in remote schools and educational institutions, as well as for organizing exhibitions of school projects and an award ceremony for the winners.

The project is one of the ways to develop scientific and technical creativity of young people. Teachers of secondary schools, mentors from among veterans of the rocket and space industry and participants in the scientific and educational project "Space Odyssey", cosmonauts of the Russian Federation are annually involved in the implementation of the project.

The implementation of the project contributes to the early career guidance of schoolchildren and students, raises the prestige of engineering specialties among young people, identifies the most gifted schoolchildren and students to build their educational trajectory in technical universities of the region and further employment at enterprises of the rocket and space industry (Kovalev et al., 2020b). the development of patriotism, instilling basic values (Khrebtov, 2020) of pride in the young generation for the development of the achievements of Russian science and cosmonautics, will allow organizing live communication between young people and cosmonaut pilots, specialists in spacecraft.

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It is important that the program of additional education "Planet X" gives the participants the opportunity to independently apply the acquired knowledge in various disciplines to study the world around them.

2. Problem Statement

In this program of additional education, it is planned to organize a series of practical classes for schoolchildren aimed at studying the world around them. Classes will be conducted in a playful way. The description of the legend of the game is given below. Using the legend of the program about the exploration of an alien (unknown) planet changes the learning atmosphere Practical exercises will be perceived as a game of the future, which not only makes learning more interesting, but also prepares students for subsequent university projects and the student body as such (Petrova, 1999).

The research work of schoolchildren should be closely combined with the school curriculum. Botany, zoology, physics, chemistry - all these subjects are taught at school with only one purpose - to tell and show students how the world in which we live works. The Planet X program enables students to independently apply the knowledge accumulated at school in various disciplines to study (cognize) the world around them. On the one hand, this will contribute to the consolidation of the theoretical material that is given in schools. On the other hand, such work will allow students to feel the importance of knowledge in the life of a modern person (Drukarenko et al., 2020).

The greatest effect can be obtained if the participants of the program are located in different parts of our planet. By comparing the results of studies of one place on Earth with several, distant hundreds or thousands of kilometers, schoolchildren will get a more complete picture of the world around them. With such a wide geographical coverage of study areas, schoolchildren will form a wider perception of the world than when observing from their own home. It is hoped that in this case, planetary thinking will be formed in them.

3. Research Questions

To achieve the set goals, it is necessary to solve the following tasks:

- Create a scenario of work that can arouse the interest of schoolchildren;
- Select the subject of research and develop a work program;
- Determine the technical support of the planned works;
- Form groups of program participants;
- Conduct classes with teachers participating in the program.

4. Purpose of the Study

The objectives of the continuing education program are:

- development of interest in knowledge of the surrounding world;
- development of research skills;
- development of teamwork skills.

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5. Research Methods

The methods and approaches used are aimed at the formation of good, sustainable knowledge of the natural conditions of the surrounding world.

Knowledge gained empirically is more firmly fixed in memory. At the same time, young people develop self-confidence in the cognitive process.

It is important that a holistic natural image of the planet is being formed.

Carrying out research in different parts of the planet at the same time, according to a single program, will allow you to obtain complete information about the object under study (process, phenomenon), to see a wider range of changes in the registered parameters. Comparison of the results of the work and their analysis will contribute to the formation of a global (planetary) perception of the surrounding world:

- Use research skills.
- By conducting research, students will get acquainted with the procedure for carrying out such work.
- They will work out a standard research scheme:
- Selection of the object of research;
- Development of research methods;
- Drawing up a research plan;
- Conducting research;
- Processing of results;
- Drawing up a report

Knowledge of this technology and the ability to implement it will help schoolchildren in the future to solve more complex and important life tasks.

6. Findings

The Planet X program is a game. It plays out the situation of the inhabitants of the Earth visiting another, unknown planet. It has no name yet. It is only known about it that this planet is very similar to the planet Earth. An interstellar station with a crew of terrestrial astronauts flew up to the planet and entered a circular orbit (Kovalev et al., 2020a, b).

For the purpose of a more detailed study of the unknown planet from the station, landing ships are sent to its surface. Each ship has a crew of 1-10 people. One of the stages in the formation of the crew can be considered the test for vocational guidance and determination of the command role according to the Belbin method (Psyworld, 2021). This not only makes the relationships between team members more efficient, but also helps to navigate the world of professions and the labor market more easily (Magun, 2006).

After completing the program, the crews return to the base station, where each crew reports to the Spaceship's Scientific Council. After discussing all the results of the work, the next research program is formed. The terms of stay on the surface of the planet are determined by the program of work.

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6.1. Stages of the program implementation

The program is being implemented in stages. The stages and their brief description are presented in Table 1.

Table 1. Stages of the program implementation

Stage number	Purpose	Short description
Stage 1	Formation of the Scientific Council of the Earth (Starship)	It includes the presenter of the program, scientists, teachers of universities and schools participating in the program.
Stage 2	Creation of the Research Program.	Any object, natural phenomenon, historical fact, etc. can be the subject of research. The choice of the subject of research should be carried out taking into account the level of knowledge of the teenager. Research should contribute to the consolidation of theoretical knowledge gained in school lessons.
Stage 3	Technical equipment of the Program	A prerequisite for the program is the use of the radio amateur complex of the International Space Station as a means of communication and information exchange in the course of work.
Stage 4	Formation of groups - participants	The group of participants consists of a crew and a crew leader (teacher)
Stage 5	Seminars for trainers - trainers	Classes with teachers are held in order to familiarize them with the work program. For the duration of the work under the program, the teacher becomes a scientific consultant for one or several crews. His responsibility is to control the execution of work in accordance with the research program.
Stage 6	Implementation of the program	All program participants work according to a single program, observing the order of research.
Stage 7	Summarizing	Holding conferences, exhibitions, fairs, etc.

6.2. Organizational and methodological requirements for the program

6.2.1. Academic Council

The Scientific Council carries out the general management of the program. Elected for the period of work under the Planet X program. His responsibilities include:

- approval of the general research program;
- control of work performance in accordance with the Research Program;
- advising instructors who are scientific supervisors of the crews;
- scientific and pedagogical assessment of the results obtained.

6.2.2. Methodological requirements for the Research Program

The research program should contain the following information:

- Subject of research;
- Research methodology;

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- Technical means necessary for conducting research;
- Chronology of research.

The form of presenting research results must be indicated.

6.2.3. An indicative list of topics that can be implemented in the Research Program:

1. Geography. Determination of the geographical coordinates of the landing area. The nature of the region's geography (steppe, woodland, mountains).

2. Botany. Determination of vegetation cover. Typical vegetation of the area. Determination of the growing season in plants. Registration of changes in plants during the research period.

3. Zoology. Fauna of the area.

4. Physics. Physical parameters of the atmosphere. Dynamics of changes in these parameters. Determination of physical constants (acceleration of free fall, speed of sound, speed of rotation of the Planet).

5. Astronomy. Drawing up a map of the starry sky of the landing area. Determination of the axis of rotation of the Planet and its position in space. Determination of the angle of rise of the Sun, etc.

6. Ecology. Determination of the wind rose. Gas composition of the atmosphere. Composition of water in reservoirs and rivers. Solving environmental problems, etc.

7. History. Determination of the history of the appearance of the first people in the study area. The history of the development of industry in the area. The history of the emergence of the language of communication.

This list can be changed and continued. It serves as an example only and should be used in the interests of the disciplines studied in the school.

6.3. Expected results

The learning effect of the program is as follows:

- Participants receive a good, sustainable knowledge of the natural conditions of the surrounding world.
- Knowledge gained empirically is more firmly fixed in memory. At the same time, young people develop self-confidence in the cognitive process.
- Formation of a holistic natural image of the planet.
- Instilling sports discipline and ecological thinking.

Carrying out research in different parts of the planet at the same time, according to a single program, will allow you to obtain complete information about the object under study (process, phenomenon), to see a wider range of changes in the registered parameters. Comparison of the results of the work and their analysis will contribute to the formation of a global (planetary) perception of the surrounding world.

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One of the key results is the acquisition of research skills. By conducting research, schoolchildren will get acquainted with the procedure for carrying out such work. They will work out a standard research scheme:

- selection of the object of research;
- development of research methods;
- drawing up a research plan;
- conducting research;
- processing of results;
- drawing up a report.

Knowledge of this technology and the ability to implement it will help schoolchildren in the future to solve more complex and important life tasks.

6.4. Qualifying round and testing

For each of the stages, specific time periods are determined, the corresponding modules are created in the Laboratory of Small Space Odyssey and upon its completion, an intermediate awarding of the stage winners was carried out.

Before participants begin to implement assignments and project activities, it is necessary to assess their level of preparation in order to properly adjust the pace, level of difficulty of the assignments and assessment criteria.

The purpose of testing is to determine your level of knowledge on topics that will further form the basis of our project: History of aviation and astronautics, Space and Astronomy, Entertaining physics, Survival in extreme conditions.

Testing can be done in the Space Laboratory.

Each test consists of 20 questions that are selected automatically from each topic. Test execution time is 45 minutes. You can change the answer to a question several times, return to previous questions, until you click "Complete and Submit" at the end of the test. After that, you will see the result of the test and the correct answers to all questions.

You can perform the test several times, at the same time, you will be given the highest grade out of all received. At the first stage, we do not want to evaluate your knowledge, we want you to check yourself and understand what you already know about space and what you need to study.

If you get more than 30 percent of the correct answers, you can write out a certificate of passing the test yourself. This is an electronic certificate. You can “download and print it”. After that, you can proceed to further pre-flight and flight missions.

7. Conclusion

The modern stage of development of society is characterized by an accelerated pace of development of technology and technology. New ideas are constantly required to create competitive products and train highly qualified personnel.

Thus, at present, the problems of creative activity and creative thinking are in the process of active study. The development of science and technology, the implementation of the achievements of scientific and technological progress contributes to the proof of the most daring theories and the advancement of new hypotheses in this area. Successes in the study of creative thinking provide additional opportunities in the process of developing the creative abilities of each human person and society as a whole.

During the implementation of the project, the participants study materials that help them decide on their future profession, “find their place in life”, and become successful researchers and engineers.

We hope that the scientific and educational project allows schoolchildren to master the basics of scientific work at the initial stage, to get acquainted with the basic concepts of inventive activity, with the rules for patenting inventions. They will be able to discover the importance of sports training and the general culture of a healthy lifestyle (Kuznetsov, 2013) and ecological thinking (Lapkin, 2000).

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