

## METHODOLOGICAL BENCHMARKS FOR PREPARING THE OLYMPIC TEAM FOR ECOLOGY

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**Summary.** The current period is characterized by the presence of various ecological problems. A solution to the recovery of this situation is the ecological education of the young generation, which can be achieved through various ways. An efficient method is that of ecological projects. The article presents the advantages of this method, examples of good practices from the activity of "M. Marinciuc" high school, which have in its list about 22 medals obtained at the Ecological Olympics using the method of ecological projects.

**Keywords:** ecological education; ecological scientific projects; research competence; Olympic lot in ecology.

## ASPECTE METODOLOGICE DE PREGĂTIRE A ECHIPEI OLIMPICE LA ECOLOGIE

**Rezumat.** Perioada actuală se caracterizează prin prezența diferitelor probleme ecologice. O soluție pentru redresarea acestei situații este educația ecologică a tinerei generații, care poate fi realizată prin diferite modalități. O metodă eficientă este cea a proiectelor ecologice. Articolul prezintă avantajele acestei metode, exemple de bune practici din activitatea Liceului „M. Marinciuc”, care are în palmares circa 22 de medalii obținute la Olimpiadele Internaționale de Ecologie prin metoda proiectelor ecologice.

**Cuvinte cheie:** educație ecologică; proiecte științifice ecologice; competență de cercetare; lot olimpic în ecologie.

*"What we shall do after we have learned; we learn only by doing"*  
(Aristotle)

### Introduction

Currently, in the face of the frequent global ecological problems related to the increasing anthropopression on the natural ecosystems, the ecological education of the population must become a priority for all the states of the world, and the school plays a decisive role in the formation and development of responsible personalities for their actions towards the environment. The European Union's environmental policy is based on the belief that strict environmental norms can provide an incentive for innovation and new opportunities for the development of a human society.

In the Republic of Moldova, ecological education is carried out in several ways:

- Compulsory school subjects (science, biology, chemistry, geography, physics, education for society, personal development, etc.);
- Various optional courses required by students (ecological education, environmental protection, etc.);

- Various school circles (young naturalist, florists, etc.).

Ecological education is not only a form of education, a tool for solving environmental problems or managing natural resources, but it is also a process of essential dimension in recognizing the needs of the environment and defining the concepts of the environment aimed to improve the quality of life [4].

A successful technique with a major impact on the ecological education of the students, especially for the gifted children, represented the scientific researches in the field of ecology are finalized by scientific works with which the students can participate in a series of competitions:

- municipal / district - the scientific conference "Work. Talent.Courtesy." - the ecology department; the municipal / district Olympics for ecology;
- republican - the republican Olympic Games on ecology; the national competition of Science and Engineering "Mold SEF";
- international - the international ecology Olympics "INESPO" (Netherlands) and "INSPO" (Turkey); the international ISEF Science and Engineering competition.

"Learning by doing" - is becoming more and more one of the basic principles of contemporary education and the training of children in scientific research skills is the highest product that the educational system can offer. "Mihai Marinciuc" high school is recognized at national level (certified by the diplomas of the Ministry of Culture and Research Education and the Ministry of Agriculture and the Ministry of the Environment) as "the most creative high school". The scientific works of our students have been appreciated with 22 medals at various International competitions. The results of the Olympic lot of the high school in ecology can be presented in the table 1.

**Table 1. Results of the "M. Marinciuc" high school Olympic Ecology Group**

Contest	The place obtained		
	1st place	2nd place	3rd place
The International Ecology Olympiad	2 golden medals	8 silver medal	12 bronze medals
The Republican Ecology Olympiad	24 diplomas	16 diplomas	6 diplomas
The Municipal Ecology Olympiad	12 diplomas	8 diplomas	6 diplomas

**The formation of scientific research competence in high school is achieved through:**

1. Motivating the students to obtain performances and to develop complex skills;
2. Motivating teachers to accumulate credits, to support and to be appreciated by the management staff;
3. Distributing the optional hours and the school circles according to the students' interests;
4. The example given by the administration;

5. Providing the institution with a material base necessary for organizing the scientific conferences of the students;
6. Organizing scientific conferences of students at local level;
7. Collaborations with scientific institutions in the country;
8. Participating in the organization of scientific conferences at national level: Mold-SEF, the Republican Ecology Olympiad.

We consider that one of the most effective methods in motivating students to research is the project method, which we use frequently. The project method was initiated by J. Dewey, supported and popularized by W. Kilpatrick, since the beginning it was based on the principle that "life is an action, not a work in order and that the school, being part of life, must adopt its characteristics [1, 2, 3].

The project method encourages the investigative spirit, enhances self-confidence and improves the attitude towards learning, assumes an increased responsibility towards one's own study, possesses opportunities for training complex competences: higher-level thinking skills, problem solving skills, collaboration and communication skills.

The results presented above do not come by themselves, after a rigorous preparation of a regular work for several years, so within the High School we already have many years in a row an Ecology Olympic Lot and the following stages of the preparation of the Olympic team are:

**Stage I** - preparatory: selection of gifted children; establishing the research theme; purpose development; setting the objectives of the scientific work.

**Stage II**- organization: documentation of specialized literature; choice of material and working methods; conducting own investigations; analysis of the obtained results; elaboration of conclusions and recommendations.

**Stage III** - presentation: poster creation; developing the presentation in Power Point or other tools; trainings with students and presentation at various competitions.

Always, as a basis for the preparation of the internal Olympic team for ecology, we have been guided by the requirements of the International Ecology Olympiad, hereinafter INESPO, which was first organized nationally on May 16, 2009, and since 2010, the Olympics has expanded internationally with over 45 different countries participating each year.

The Cosmicus Foundation of the Netherlands (the founders of this international competition) wants to raise awareness of the young generation about its contribution to the environment by introducing simple and practical scientific projects. INESPO will be the stage in which the next generation will exercise their knowledge and love for science, contributing to a solution for different environmental problems.

All the registered scientific projects go through a preliminary round of elimination due to the large number of registrations, and in the elaboration and presentation of the scientific project the judging criteria presented must be taken into account [5], in Table 2.

**Table 2. Judging criteria at INESPO**

Criteria	Criteria Details	Point
1. Quality of poster	<i>Well-organized the research and project log.</i>	10
2. Quality of presentation	<i>Clear explanation of the project, research method, results and conclusion.</i>	10
3. Creativity/Originality	<i>Originality of the problem, unique approach to solving a societal problem.</i>	10
4. Feasibility	<i>Practical applications of the project; economic and technological consistence, does the project contribute to the society in some way.</i>	10
5. Literature review	<i>Have scientific literature and references been used during research?</i>	10
6. Scientific Thinking	<i>Do students have a clear statement of the hypothesis? Are the goal and the identification of all relevant variables clearly defined?</i>	10
7. Scientific Methods/ Data management	<i>The students must prove that they are well aware of the contents of the substance, followed by appropriate methods for experiments and investigations. Proper recording and playback of data in tables and graphs, proper analysis of the data.</i>	10
8. Conclusion	<i>Sketches of logical conclusion, the consistency of the statement with acquired results, recommendation for further investigation.</i>	10
9. Research Skills and Effort	<i>Level of skills and efforts of (every) researcher to carry out the project of work, knowledge of techniques and equipment used to collect data.</i>	10
10. Insight / Understanding of Project	<i>Insight of (every) student into each step during the implementation of the project.</i>	10

We urge all the animators of the Olympic groups to take into account the requirements of INESPO, because since 2017 in the Republic of Moldova they have been taken as a basis to organize the Republican Olympics for Ecology. Unfortunately, we

would like to mention, that at the republican stage, not all the districts of the country are included and we want a more active participation of the children from the country in this contest.

### **Conclusion**

Regardless of the way in which ecological education is carried out, it is important to execute it at the level of humanity, because it is a "process meant to attract categories of people who are aware and concerned about environmental issues and complementary problems, people who have the knowledge, the attitude, the ability, motivation and ability to work individually and collectively to find solutions to current problems but also to prevent the emergence of others".

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