The development of environmental competence of students through the implementation of the project “Plant wealth of Russia: from region to region”

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Abstract. The authors present the main stages and results of the project “Plant wealth of Russia: from region to region”. Project goal is the development of environmental competence and the overall environmental culture of students of educational organizations. The project is focused on the study of the practical application, conservation and protection of plants in the regions of Russia. The project consists of three stages: the project at the local level called “Plant resources of the region’s ecosystem as the main source of healthy nutrition”; regional forum called “Life in the Ecostyle” and all-Russian festival “Plant “ornament” of Russia”. At the end of the festival, a model of the Plant “ornament” of Russia was presented depicting the diversity of plant resources of the participating regions of the festival. Each stage of the project is designed to expand the target audience. In the future, authors plan to implement the project in the format of all-Russian festivals in different regions.

1 Introduction

In studies devoted to the problem of the formation of ecological competence of participants in the educational process (students and teachers), environmental competence is the basis for the development of the ecological culture of a person [1–9]. The goal of environmental education is ultimately to enable a person to attain a more ecological way of life. The contents of environmental competence include the following formulations: theoretical and practical readiness of a person to relate to the environment; the ability to apply environmental knowledge in practical, professional activities; the ability to evaluate the results of their activities in terms of harming nature [1, 3, 4, 10].

Researchers share elementary environmental competence and graduate environmental competency. Elementary environmental competence is the ability to determine the level and nature of ecosystems in your region. The environmental competence of the graduate is an
integrated ability to form an environmental culture of the individual. Ecological competence consists of value, cognitive and activity components [1–10].

The formation and development of environmental competence is carried out in the process of educational and extracurricular activities. In the process of training under the programs of general and secondary general education, environmental competence is formed in the classes on environmental management, biology and others. In educational institutions environmental competence becomes one of the main ones for environmental-biological, ecological-geographical areas. For students studying in areas of a non-environmental profile, the development of environmental competence is carried out in interdisciplinary courses. Considering that in the process of educational activity not a large number of hours is allocated for the development and formation of environmental competence, the main tool for the implementation of this task is the organization of extracurricular environmental activities [1–10]. L. Chawla, D. Cushing consider four areas of research that shed light on how to promote active environmental care in children and young people: research on sources of pro-environmental behavior, socialization for democratic skills and values, development of a personal sense of competence and the development of collective competence. Actions in the home or in public places, such as schools, require a personal sense of competence and a sense of collective competence or confidence in the ability to achieve the goal when working with a group. Therefore, the experience that contributes to the development of these assets is also summarized [4]. Traditionally, the emphasis in environmental education is on theoretically derived environmental non-specific abilities. The competence model of F. Kaiser, N. Roczen and F. Bogner is based on ecology-specific abilities “knowledge of the environment” and “communication of people with nature”, which have been defined as experiential improvement in individual behavior in the environment. They argue that an evidence-based model of competence, the achievement of which in real life, is an improvement in the environmental health of the entire human consumption pattern. The formation of competencies in environmental education - along with advances in knowledge and in pleasant experiences of people in nature - should preferably include the integration of knowledge and thus structural development [1–3].

The project “Plant wealth of Russia: from region to region” was implemented in order to develop environmental competencies among young people.

2 Methods, results and discussion

Project goal: the development of environmental competence and the overall environmental culture of students of educational and scientific organizations.

Project objectives:
- development of environmental competence of students;
- the formation of environmental culture of the individual;
- attracting the young generation to activities to protect and preserve plants, revive natural objects;
- development of design, research, communication and entrepreneurial skills [1–10];
- creating conditions for self-realization, professional and creative development of youth.

Target audience: students of educational and scientific organizations.

Methods used in the process of project implementation: analysis, observation, organization, collection of information, work with literature, online sources, presentation.

The project consists of three stages:
1. The project at the local level “Plant resources of the region’s ecosystem as the main source of healthy nutrition”. Organization - developer: “College of the industry of
food, trade and services” and “All-Russian Research Institute of Phytopathology”. The project was implemented on the basis of college. Project goal: study and practical application of the plant resource of the ecosystem of the Tomsk region for the production of healthy food. The organization features and project results are published in detail in the “Environmental educational project as a way of forming a healthy food culture: experience of the Tomsk region” [11].

2. Regional forum “Life in the Eco-style”. The purpose of the event: the revitalization of the environmental education of the young generation, the formation of the general ecological culture of students, the education of a citizen who is able to take an active life position in solving environmental problems. Objectives of the event: development of ecological culture of young people; identification and support of talented youth who have the ability to creatively solve problems of preserving the natural environment, cultural and natural heritage and the rational use of natural resources; promoting personal self-development and professional self-determination of youth; analysis of best practices in the use, conservation and protection of plant resources of the regions. In the forum were organized master classes, a conference in the form of poster presentations on the topic: “Using the biodiversity of the Tomsk Region in everyday life” and a competition for design projects “Fashion from Waste” (“eco” in modern clothes).

Results:
At the level of practical significance:
- students got acquainted with the methods of using recyclables for domestic and aesthetic purposes;
- raising the level of understanding among young people of the need to preserve and protect the biodiversity of the region through the design and research activities of students to identify the beneficial properties of plants in the region and methods of their use in everyday life;
At the level of educational activity:
- organization of extracurricular activities of students using design and research technologies;
- the development of environmental, entrepreneurial and communicative competencies of students;
- development of creativity and aesthetic taste in the integration of design solutions and the use of environmentally friendly materials;
At the level of research activities:
- the development of research activities of students in the use and conservation of biodiversity in the region.

According to the results of the scientific and practical conference, the best projects (“The use of pine nuts in bakery”, “Burdock - weed and doctor”) were awarded prizes.

3. All-Russian festival “Plant “ornament” of Russia”. The purpose of the event: creating a platform for the exchange of experience of theoretical and practical activities in the field of use, conservation and protection of plant resources of the regions. At the festival were organized different events:

1. Discussion platforms on topics:
   Topic 1: “Use of plant resources of the region in food and cosmetic products”;
   Topic 2: “Plant protection methods and conservation of the region’s biodiversity” [12–27];
   Topic 3: “Development of environmental competencies and environmental culture through extracurricular activities (environmental volunteer teams, environmental campaigns and projects, social advertising)”;
   Topic 4: “Research activities in the field of plant protection: prospects and results” (for young scientists, employees of research institutes) [12–27].
2. Exhibition-Fair of Food, Cosmetics and Jewelry Made from Plant Raw Materials. The exhibition was presented a single information resource, the main task of which is to collect and process information on regional goods, useful properties, manufacturing methods and other characteristics. One of the urgent directions in the formation of environmental competence is the development of information technologies in the field of ecology. In this case, the information resource was created in order to familiarize participants and users with regional products [28].

3. Video contest “Russia as my “living house”. The topic of video clips should be related to the problems of protecting and preserving the region’s plant resources.

Results:
At the level of practical significance:
• raising the level of understanding among young people of the need to preserve and protect the plant resources of the region by creating conditions for the exchange of experience in theoretical and practical activities in the field of environmental education and training;
• development of ecological culture of youth;
At the level of educational activity:
• organization of extracurricular activities of students using design and research technologies;
• development of environmental, design, research and communication competencies of students;
• development of creative potential and professional self-determination;
At the level of research activities:
• the development of research activities of students in the use and conservation of plant resources of the region.

At the end of the festival, a model of the Plant “ornament” of Russia was presented depicting the diversity of plant resources of the participating regions of the festival.

3 Conclusions

In the conditions of the ecological crisis, it becomes necessary to develop and form an environmental culture of the individual, especially for the younger generation. Ecological culture is formed in the process of educational and extracurricular activities of participants in the educational process (from the level of secondary general education to highly qualified personnel). Environmental education has grown thanks to the promotion of innovative educational approaches and the increasing attention paid to the human aspects of the system. Some of them, especially the idea of sustainability, need further development and careful use. Much work is needed to integrate environmental and social systems into a single conceptual structure and prevent the development of confusion, which is not its consequence, to solve global problems that challenge survival, while remaining realistic and practical within the system. The main criterion for the development of ecological culture of an individual is the formation of environmental competence [1–10]. The presented project contributes to solving the strategic tasks set in the projects and programs of the Government of the Russian Federation on the development of environmental education, the digital economy and the preservation of the environment. The project includes activities affecting current environmental issues and contributing to the development of environmental competence among young people. Project activities are planned taking into account the use of design and research educational technology. At each stage of project implementation, results are recorded that show positive dynamics in the formation of youth interest in environmental issues:
- willingness to develop and implement local projects in the territory of own region;
- design and modeling of scientific and managerial decisions on environmental safety, plant protection and biodiversity conservation;
- attracting the young generation to activities aimed at improving the environmental situation in the country.

The presented project is focused on the study of the practical application, conservation and protection of plants of the Russian regions [12–27]. Each stage of the project is designed to expand the target audience. In the future, it is planned to continue the implementation of the project in the format of all-Russian festivals.

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