Environmental educational project as a way of forming a healthy food culture

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Abstract. In the article, the author reveals the main directions of European research in the field of environmental education and the ecology of health. Examples of projects implemented in higher educational institutions, colleges and schools are given. The article outlines the relevance, the main stages and results of the implementation of the environmental educational project in the Tomsk region. The author, together with the staff of educational and scientific institutions, implemented a project whose product was business ideas for using the regional plant ecosystem resource for the production of healthy food. The purpose of the project is the study and practical application of the plant resource of the ecosystem of the Tomsk Region for the production of healthy foods. Stages of the project are analytical, organizational, practical, presentation. The methods used in the project are design, analytical, development. The result of the project was the presentation of business projects of college students.

1 Introduction

Over the past 10 years, the number of articles and studies on environmental education has increased [1]. At the same time, many scientists write about the need to establish links between physical activity and ecology [2], the need for in-depth study of ecology in the framework of biology [3], the introduction of additional disciplines: "health education" [4], "environmental consultant" [5] and others. Due to the growing number of articles currently available and the growing specialization of scientists, it becomes difficult to identify, not to mention reading, important articles on topics that are not directly related to a particular field of research or that are older than a few years [6]. During the study, it was possible to compile a list of 544 articles proposed by 147 environmental experts (members of editorial journals) [6].

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Separately, we can highlight the topic of environmental knowledge as a promising one for solving the problem of environmental literacy [7]. P. Reason offers the right form of education for environmental understanding - one that will rely on aesthetics, grace and ceremony [8].

The theme of environmental education, healthy nutrition and the conservation of natural resources is given special attention in the educational system, both higher and secondary [9]. For researchers, it becomes important to determine the similarities and differences in approaches to ecology in the education of different countries [10]. Distance learning courses on environmental issues are becoming relevant in the world of modern technology. Distance learning, facilitated by modern telecommunications and computer technology, is revolutionizing college-level courses. Specialists in the field of media production and web page development are crucial - not only so that teachers can focus on content, but also to produce material that compares favorably with television programs that students are familiar with. Despite the difficulties, it is believed that many courses on natural resources are suitable for this format because of the photogenic nature of the topics and the wide interest in them, and that over time, distance education courses can recoup the costs of their development [11]. In addition, it should be noted the growing interest in the creation and implementation of environmental projects in the educational environment [12]. For example, a project to study the ecology of stress, the product of which is a program that provides on-the-job training opportunities for students and staff with various humanitarian and applied knowledge [13].

Jason M Aloisio, Brian Johnson et al. Have proposed the TRUE research project (Teens Researching Urban Ecology), which will produce a model that combines pre-college, urban ecology, and mentoring in relational research [14]. In addition, we give an example of a project implemented by schools in the field of health ecology. The study led to various conclusions about PH in the context of implementing an integrated approach to health promotion in schools. The results indicate the need for a combined approach that includes behavioral programs (individual HL skills) and structural / environmental programs (systemic difficulties, HL school specialists / teachers, conditions and school infrastructure and networks). The inclusion of students, school staff and parents in school health promotion activities can help empowerment and self-determination. Applying HL to other areas of health, such as mental, electronic / digital / media health, or tobacco / alcohol / substance, seems like a useful approach to school health [7].

In 2018-2019 on the basis of the College of the industry of food, trade and services with the support of the All Russian Research Institute of Phytopathology, a project called “Plant resources of the region’s ecosystem as the main source of healthy nutrition” was implemented. The relevance of the project is due, firstly, to the main directions of the regional development strategy and the use of regional products in production [15,16], and secondly, to the interest of consumers in environmentally friendly food products that ensure the supply of basic nutrients to the human body and do not contain heavy metals, pesticides, radionuclides and other contaminants. On the territory of the Tomsk region, many different regional products are used in food production, such as blueberries, pine nuts and cones, cranberries and others. However, the plant ecosystem of Tomsk Oblast is rich in less popular plant species for the food industry, but abundant in vitamins necessary for human health [17, 18].

Thus, the goal of the project was the study and practical application of the plant resource of the Tomsk Region ecosystem for the production of healthy food.

Project Objectives:
– the use of modern information technologies for the search and processing of information on plant species of the Tomsk region by college students in order to develop professional knowledge and skills;
– development of a business idea on the application of acquired knowledge about plants of the Tomsk region;
– expansion and enrichment of knowledge conducive to the development of environmental culture of students;
– the organization of the development of student design technology through the implementation of specific works on ecology and other natural sciences.

Expected Result:
– At the level of practical significance of the project:
  – development of business ideas on the use of plant resources of the Tomsk region for the production of healthy food and possible options for its implementation.
– At the organizational level:
  – organization of classroom and extracurricular activities with students in order to familiarize themselves with the plant resources of the Tomsk Region, the chemical composition, the availability of nutrients and how to use them.
– At the level of educational activity:
  – the formation of students' motivation to study regional resources as the main sources of healthy nutrition;
  – development of students' ecological culture;
  – development of entrepreneurial competencies through the development of a business idea.

2 The method, experimental results and discussion

Ecology, as a branch of the natural sciences, operates on the basis of the National Education Standards of the United States (National Academy of Sciences, 1995) [19], for which the use of discovery methods in scientific education becomes important. This method allows you to actively engage students in the work process, discuss, negotiate and collaborate with their peers to build their own knowledge [20].

Our project was attended by students of the 2nd year of college (12 people). The product of the project was to become a business idea for using the plant resource of the Tomsk Region ecosystem for the production of healthy food.

The project included four stages lasting from November 2018. until March 2019:
– At the first stage of the project (analytical stage), teachers of ecology and chemistry of the college conducted classroom classes on the topics: “Healthy nutrition. Essential Nutrients for Human Health”, “Plant Resources of the Tomsk Region Ecosystem”. The staff of the All-Russian Research Institute of Phytopathology held consultations on plant protection methods in the framework of the topic of the ecological situation in the region. Form of work: classroom. Methods of work: analysis, observation.
– At the second stage (organizational stage), a team meeting and an explanation of the assignment were held. Using technology “project activities” at this stage of the project helps students not only to find the necessary information, but also to identify goals, objectives, stages of implementation and the practical result.

The task:
– 1. To study the features of the plant resource of the ecosystem of the Tomsk region: chemical composition, nutrients.
2. Find information on options for using plants in the region for a healthy diet.
3. Identify goals, objectives, stages of implementation and the practical result of the project.
4. To develop and present a business idea on the use of plants for the production of healthy foods.

Form of work: classroom. Methods of work: analysis, organization.

The third stage (practical) included sub-steps:

Stage 1. Students independently search and collect information. At this stage, the project executives provide advisory assistance in the analysis of the information received, search sources, design.

Stage 2. Students independently determine what types of plants of the Tomsk region they will use to develop a business idea. At this stage, the analysis of the information collected is carried out, and methods for using plants for healthy nutrition are developed.

Stage 3. Development of business ideas and presentation design. At this stage, an analysis of the practical significance and possibilities of implementing a business idea is carried out.

Form of work: extracurricular. Methods of work: collecting information, working with literature, online sources; processing the information collected; business idea development. At the fourth stage (presentation), students present projects of business ideas on the use of plants of the Tomsk Region for the production of healthy nutrition products, an analysis of the submitted works, and adjustment of provisions is carried out. Form of work: classroom.

Methods of work: presentation of a business idea.

For example, the business project "Creating a Collection of recipes based on grassy weeds of the Tomsk region"

The objective of this project is to create a recipe book that would focus on those types of ingredients that have not found a place in everyday life as one of the main types of raw materials for cooking.

The direction of this project is a healthy diet, based on the use of those types of products that a common man in everyday life most likely did not think about.

Field of activity: catering.

The main product in this case will be a book / collection of recipes based on the use of weeds, plants that have not found application in everyday life.

The effectiveness of the project:

The volume of output, and specifically in this case the book, should not be a large enough circulation, which can be increased as this book / collection of recipes will be sold.

The intended buyers of this product should be people who make a bias towards a healthy diet, as well as those who want to diversify and supplement their diet with something new and at the same time useful.

The markets for the sale of this collection of recipes should be bookstores and chains of kiosks that sell various kinds of printed products.

The level of profitability is not bad enough, since print media are not replete with recipes that are both so specific and at the same time simple and not complicated to use.

As for the prospects of this project, it depends on the degree to which people are interested in such recipe collections, and since there is a tendency in the world to switch to a healthy diet and experiment in cooking with less-used types of products, there is more than a prospect and profitability be. If the collection of recipes is successful, then it will be possible to realize the idea of opening a restaurant / snack from the collection of recipes. In addition, the collection of recipes will be a good prerequisite for the creation of small agricultural enterprises and / or a specialized chain of stores that sell these types of products.
3 Conclusions

Among the proposed business ideas, the most significant and relevant according to the results of the presentation were:

1. A draft collection of recipes, which includes recipes from various herbs and berries growing in the region (for example, chickweed, nettle, quinoa, blueberries and others).
2. The recipe for bread with the addition of nettles. The recipe calculated the portion of calcium contained in nettles that a person needs per day.
3. Cafe-confectionery based on molecular cuisine using regional products.

This project was submitted to the competition as part of the International project “Ecological Culture. Peace and harmony” [21] and was awarded a silver certificate.

Compliance of the project with the concept of sustainable development:
1) indicators of social aspects: the development of education, environmental literacy, environmental education programs; protecting and improving people's health;
2) indicators of economic aspects: changing consumption patterns through the development of healthy nutrition recipes; financial resources and mechanisms for their rational use through the development of business ideas; transfer of environmentally friendly technologies;
3) indicators of environmental aspects: an integrated approach to planning and land management; ensuring sustainable development of agriculture and rural areas; biodiversity conservation; environmentally friendly biotechnology;
4) indicators of institutional aspects: integration of environmental interests and development principles in the decision-making process; science and sustainable development.

Project organizers until December 2019. We plan to finalize, expand the audience and implement this project in the form of an environmental forum. The results are confirmed by the work of other scientists [22-32].

References

1. E. Hutchins, Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 44(22) 566–569 (2000)
2. P. Hastie, D. Siedentop, European Physical Education Review, 5(1) 9–30 (1999)
3. R. W. Kimmerer, BioScience, 52(5) 432–438 (2002)
4. M. Money, Health Education Research, 7(2) 301–303 (1992)
5. R. Gould, Educational Administration, 4(2) 14–23, (1976)
6. F. Courchamp, C. J. A. Bradshaw, Nature Ecology & Evolution, 2 395–401 (2018)
7. O. Okan, U. Bauer, U. H. Bittlingmayer, European Journal of Public Health, 28(4) 287 (2018)
8. P. Reason, Management Learning, 38(1) 27–44 (2007)
9. S. Santon, Social Problems, 11(4) 15–28 (1964)
10. R. Symonds, African Affairs, 263 158–159 (1967)
11. J.D. Walstad, M.D. Reed, P.S. Doescher, J.B. Kauffman, R.F. Miller, B.A. Shindler, J.C. Tappeiner, Journal of Forestry, 101(7) 16–20 (2003)
12. B. Adam, K. Geißler, M. Held, K. Kümmerer, M. Schneider, Time & Society, 6(1) 73–84 (1997)
13. G. W. Barrett, G. M. Van Dyne, E. P. Odum, BioScience, 26(3) 192–194 (1967)
14. J. M Aloisio, B. Johnson, J. D Lewis, J A. Clark, J. Munshi-South, Su-Jen Roberts, D. Wasserman, J. Heimlich, K. Tingley, Journal of Urban Ecology, 4(1) 5227714 (2018)
15. Strategy for socio-economic development of the Tomsk region until 2030, 2580 (2015)
16. T. G. Morozova, Regional Economics, 22 234 (2007)
17. M. V. Olonova, Plants of the Tomsk Region. Flowering time: [reference], 46 (2009)
18. N. A. Olonov, Plants of the Tomsk Region. Second half of summer, 31 (2009)
19. National Science Education Standards, 4962 (1995)
20. B. Tomlinson, E. Baumer, M. Lok Yau F. Lynn Carpenter, R. Black, E-Learning and Digital Media, 5(3) 238-255 (2008)
21. International project “Ecological Culture. Peace and harmony”, 29012019 (2019)
22. A.V. Moroz, V.V. Davydov, V.Yu. Rud, Yu.V. Rud, V.C. Shpunt, A.P. Glinushkin, Journal of Physics: Conference Series, 1135(1) 012060 (2018)
23. V.B. Fadeenko, V V Davydov, V Yu Rud’, A P Glinushkin, Yu V Rud’, V Ch Shpunt, Journal of Physics: Conference Series, 917(9) 092015 (2017)
24. I.A. Zharikov, R.V. Davydov, V.A. Lyapishev, V.Yu. Rud, Yu.V. Rud, A.P. Glinushkin, Journal of Physics: Conference Series, 917(5) 052011 (2017)
25. I.S. Kudryashova, V.Yu. Rud, Yu.V. Rud, V.Ch. Shpunt, A.P. Glinushkin, N.N. Bykova, Journal of Physics: Conference Series, 929(1) 012021 (2017)
26. N. Grebenikova, A. Korshunov, V. Rud, I. Savchenko, M. Marques, MATEC Web of Conference, 245 11006 (2018)
27. R. Davydov, M. Sokolov, W. Hogland, A. Glimushkin, A. Markaryan, MATEC Web of Conference, 245 11003 (2018)
28. J. Stenis, W. Hogland, M. Sokolov, V. Rud, R. Davydyov, IOP Conference Series: Materials Science and Engineering, 497(1) 012061 (2019)
29. I.S. Kudryashova, V.Yu. Rud, V.Ch. Shpunt, Yu.V. Rud, A.P. Glinushkin, Journal of Physics: Conference Series, 741(1) 012106 (2016)
30. V.A. Lyapishev, V.Yu. Rud, M.S. Sokolov, A.V. Cheremisin, Proceedings of the 2018 IEEE International Conference on Electrical Engineering and Photonics, EEExPolytech 2018, 8564387 292-294 (2018)
31. N.M. Grebenikova, K.J. Smirnov, V.V. Davydov, V.Y. Rud, Journal of Physics: Conference Series, 1124(4) 041011 (2018)
32. I.A. Zharikov, V.Yu. Rud, Yu.V. Rud, E.I. Terukov, V.V. Davydov, N.N. Bykova, Journal of Physics: Conference Series, 1038(1) 012100 (2018)