

The methodological principles for developing environmental education in the republic of Uzbekistan

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Abstract. The article discusses the importance of developing environmental education in the Republic of Uzbekistan, emphasizing the ecological significance, global concern for nature conservation, ongoing efforts to deliver sustainable education to future generations without shortages, the demands placed on the education and upbringing processes in our country, and their content. It also highlights the significance of ecological initiatives, systematic tasks and assignments aimed at enhancing environmental education within the comprehensive education system, and the structure for developing students' ecological competence. Key words: environmental education, ecological consciousness, comprehensive education, ecological competence, ecological perception, ecological entrepreneurship, ecological harmony, ecological thinking, national identity, cultural heritage, spirituality, ecological worldview.

1 Introduction

Throughout history, humanity has coexisted with the natural world. From the dawn of creation, humans have held a unique position within the ecological landscape, necessitating prudent actions to mitigate the escalating risk of disrupting the natural balance and facing ecological crises.

We know well from our history that it is necessary to protect the surrounding natural environment, mother nature like the apple of our eye. "Avesta", an ancient source related to the history of Central Asia, also mentions the need to protect mother nature, to protect the gifts created by God, for example, not to trample the soil, not to pollute the water, not to cut trees, not to harm the flora and fauna.

The sacred earth, clean air, pristine water, and the abundant sunlight are all extraordinary gifts of nature. Humans inherently appreciate these blessings from the moment of birth, which is why we refer to it as mother nature. Safeguarding the environment and mother nature is our primary responsibility.

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2 Materials and methods

Today, the world community has realized the need for unanimity in preserving nature and passing it on to future generations. Special dates have been set by the United Nations to focus on nature conservation.

In particular, on the occasion of March 21 World Forest Day, March 22 World Water Day, April 22 World Earth Day, June 5 World Environment Day and other similar dates, the world community invites people to cooperation and solidarity.

Significant work is being done to preserve nature in our country. Over the past years, the legislative framework for environmental protection and rational use of nature has been formed in our country. Currently, there are more than 20 laws and more than 130 other legal documents regulating various aspects of environmental protection. On “Environmental protection and ensuring environmental safety”, “Use and protection of subsoil”, “Water use and protection”, “Protection and use of forests and flora”, “Protection and use of fauna” are among them.

The Law on “Environmental protection and ensuring environmental safety” is the main document in the field of environmental protection and rational use of natural resources.

The law “On Environmental Control” proposed as part of the concept of deepening democratic reforms and development of civil society was adopted in our country.

Our republic has gained unique experience in the rational use of natural resources, ensuring environmental safety, and increasing the ecological culture of the population. Especially “Thriving district”, “Thriving household”, “Hashar Elga Yarashar”, “Ecology and People’s Health” eco-festival, “Human and Nature”, “A clean environment is the guarantee of a healthy generation”, “Nature and youth”, “Healthy environment begins with nature”, “Value is mother nature”, “Uzbekistan is our sole home”, “Ecological values”, “Ecological education according to the views of Eastern sages” is becoming important. Promoting a healthy lifestyle among the population, preparing young boys and girls for families, a number of activities are being carried out locally. The series of classes of the “Young Family Builders” school are devoted to the issues of reproductive health and ecology [1-10].

Environmental and atmospheric damage is a concern of the entire world community today. In particular, we have witnessed a number of ecological disasters in recent years. The tragedy of the Aral Sea became the tragedy of the century. The Aral Sea, which only yesterday brought happiness and blessings to people, today brings misfortunes to mankind.

Air pollution is the most serious environmental threat to human health, and achieving clean air is one of the reasons that can prevent death and disease in the world. According to UN estimates, 9 out of 10 people around the world breathe polluted air. This leads to cardiovascular disease, stroke, lung cancer and other respiratory diseases. Air pollution also poses threats to the economy, food security, and the environment.

According to statistics, 70-90 tons of industrial waste correspond to one square kilometer per year. A century ago, industrial dust in the air was 1-2%, now it is 30%, and in large cities 50%.

The planet is our shared residence, and thus, it is our responsibility to preserve it. Every responsible individual should play a part in this endeavor.

Presently, the United Nations has initiated various environmental protection programs, under which significant green initiatives are being implemented extensively in urban areas and their surroundings.

About three thousand hectares of land in Uzbekistan is a forest area. In order to protect cities from harmful dust and radiation, special consideration is being given to planting spruce, pine, oleaster, ash trees, mulberry, poplar. These trees protect water and air from harmful dust and enrich it with oxygen. For example, a spruce planted on one hectare of land blocks 32 tons of dust. A pine tree on one hectare of land produces 30 tons of oxygen in a year. It

has been proven that the air in the forest area is four to six degrees lower than in the open ground in summer. In such a place, air humidity increases by ten to fifteen percent.

A forest absorbs seven to ten tons of carbon dioxide and holds a hundred tons of dust. A tree plantation on one hectare of land produces four to six tons of oxygen. As you know, it is very important to save the green fauna. That is why juniper trees are planted in our cities, which produce more oxygen than other trees.

The environmental problems, tensions and crises that have occurred on our planet until today are to a certain extent related to people's ruthless use of natural resources and endowments, negligence on the environment, and low ecological culture. Therefore, living in a healthy environment requires protection and preservation of fresh air, pure water, earth and space.

Ecological culture of a person is a conscious outcome of ecological education and upbringing. This skill begins with a positive attitude and love for nature formed in a person since childhood. This love and attitude starts with everyone trying to keep their yard, street and neighborhood clean and green.

The initial stage of environmental education is formed in the family, and developed at school. In this case, it is necessary to organize environmental education in a purposeful manner during training with students. First of all, it is necessary to set clear measures for students to form an ecological approach to nature, to the decisions made by enterprises, factories, and communities in relation to various objects of the environment, to the analysis of older people and their character and behavior.

Another important form of ecological education is beautification of each learner's territory, planting and maintenance of seedlings, trees, cleaning springs, lakes and ditches from waste and other practical work. As a result of such activities, the necessary ecological, legal, moral and aesthetic views related to nature are formed in young people. Pupils understand the place of man in nature, the importance of nature protection activities for his hometown or neighborhood, the importance of an active life perspective in solving the issues of keeping the land and air, lakes, and rivers clean.

It is the goal-oriented practical activity of young people in the field of nature protection that is an important condition for the formation of individual environmental awareness. In Uzbekistan, the issues of environmental education and upbringing are included in the "Kindergarten Education Program". The next stages of this urgent issue will be continued in schools, vocational educational institutions and higher educational institutions, as well as directly in enterprises.

Therefore, one of the important ways of forming the ecological consciousness of young people is to educate them in their moral attitude towards nature.

Considering the increasing global significance of environmental issues, there has been notable emphasis in recent years on addressing priorities such as environmental protection, fostering environmental consciousness, promoting environmental education, and raising awareness about environmental matters.

The relevance of ecological education is determined by the need to protect the nature, ecosystems, environment of our country from instability and degradation, to increase the environmental culture of the population, to contribute to these very serious and vital issues of all layers of the population, especially young people.

Cabinet of Ministers of the Republic of Uzbekistan resolution 434, adopted on May 27, 2019 on the "Concept for the Development of Ecological Education in the Republic of Uzbekistan" ensures the implementation of the tasks set in it are the basis of our above opinions.

Enhancing the ecological education system in Uzbekistan through effectively implementing the concept of ecological education development holds significant importance.

In this concept, the main goal is the formation and development of ecological knowledge, consciousness and culture in the growing young generation, the effective organization of the ecological education process, as well as the further improvement of science in the field of ecology, involving the world's advanced innovative technologies.

Several critical tasks associated with achieving the stated objective have been outlined. Including,

Following the regulations set forth in the Republic of Uzbekistan's "On Education" and "On Nature Protection" laws, establishing the fundamental principles for advancing environmental education within the integrated education system, progressively integrating them into the educational curriculum, and thereby enhancing the efficacy of environmental education to a higher standard;

- Providing environmental education and upbringing, promoting ecological sciences, conducting environmental activities, organizing observations and competitions, and creating social advertising and similar activities;

- Enhancing existing educational programs to address environmental issues and adapting them to meet current requirements.

- Strengthening students' awareness of general environmental issues to enhance their responsibility for preserving and utilizing the resources of nature sustainably.

- Developing and implementing effective methods and approaches for environmental education.

- Establishing a legal, material-technical, and informational framework to ensure the quality, efficiency, and sustainable development of environmental education, as well as the effectiveness of personnel training systems.

- Enhancing collaborative efforts between state agencies responsible for environmental protection and the education sector to safeguard ecology and the surrounding environment.

- A strategic plan has been developed within the framework of the concept to implement the identified tasks in our country's continuous education system, based on modern educational approaches, in a phased manner (see Figure 1).

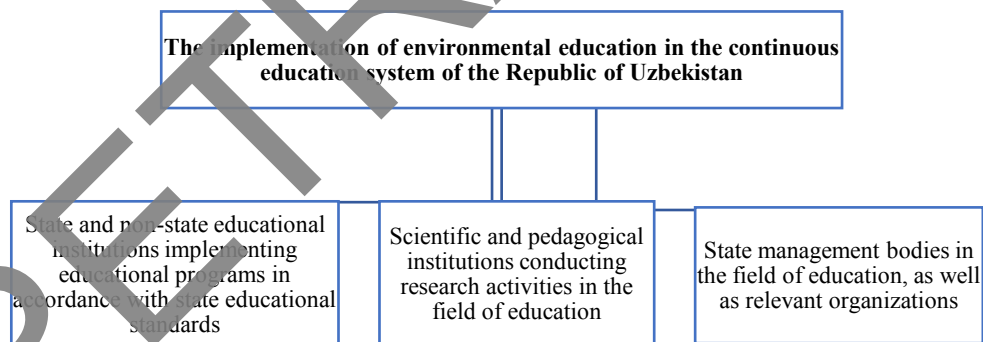


Fig. 1. Introducing environmental education to students within Uzbekistan's continuous education system

This process encompasses preschool education and upbringing, general secondary and secondary specialized education, vocational education, higher education, post-secondary education, personnel retraining, and skills enhancement, categorized by various forms of extracurricular education (refer to Table 1).

Table 1. Enhanced systematic integration of environmental education tasks and assignments within the continuous education system

№	Continuous education system	The content of systematic duties and responsibilities concerning the enhancement of environmental education within educational establishments.
1	In preschool education	- Revision of the “Bolajon” basic program, raising the first ideas of children about the preservation of mother nature in the program and increasing the topics of its preservation ecology and environmental protection; - development and implementation of the “Ecolog Bolajon” program in order to fully organize the environmental education topics and practical training specified in the basic program;
2	In general secondary education	-reanalysis and establishing supplementary metrics according to the parameters fostering environmental awareness in students as outlined in the state education standards and curricula; -enhancing knowledge, skills, and competencies aligned with the prescribed content of the state education standards and educational programs; -implementing ecological education tailored to individual classes, considering students’ ages, physical abilities, and psychological traits; -adhering to educational principles such as progression “from simple to complex”, as well as promoting “integraliyt and continuity”;
3	In vocational and professional education	-providing students with ecological knowledge considering the direction of educational institutions; -introducing the daily rules of preserving the environment and the ecological features of sustainable development in the local context together with the requirements of general ecological education; -including ecological education topics in relevant subject content; -incorporating topics such as “Basic ecological factors and ecological systems,” “Reasons for the emergence of various ecological problems, biological, geological stages in nature,” “Conservation of nature, rational use of natural resources,” “Utilization of innovative ideas and technologies in the field of ecology” into the subject content; - utilizing modern information and communication technologies in the development of ecological education; - conducting competitions and other events (seminars, eco-expeditions, “roundtable discussions,” and creative meetings) in line with the “Ecology expert” and directions.
	In higher education	-5630100 -revising and refining the curriculum and subject programs for the “Ecology and Environmental Conservation” undergraduate education direction, as well as implementing decisions made in the field of ecology and modern pedagogical technologies; - developing proposals for the introduction of new directions and specialties into the “Classification of Higher Education Directions and Specializations.” - expanding and enriching the content of relevant educational subjects on ecology and environmental conservation with additional topics; - providing students with sufficient knowledge in the prescribed volume of subject programs and shaping necessary skills and competencies; - introducing topics related to ecology and environmental conservation into non-ecological disciplines; - incorporating engaging materials from existing internet websites related to ecology into students’ learning resources..

	In postgraduate education	<ul style="list-style-type: none"> - advancing the methodology of scientific research in the field of ecology through ecological education, and implementing scientific and pedagogical work in ecological research and pedagogy in specialized scientific and educational institutions; - developing practical solutions in independent research activities in ecological research, creating opportunities for utilizing the latest achievements in science, technology, and technology-based information databases in the field of ecology by researchers. - further refining the topics of doctoral dissertations on issues related to ecology and environmental conservation in the doctoral program, providing systematic guidance for deep theoretical and practical research, and ensuring organized support for enhancing the quality and effectiveness of such research.
	In the stages of retraining and skill improvement of personnel	<ul style="list-style-type: none"> - reformulating state requirements and educational programs for the retraining and skill enhancement of specialists in the field of environmental protection based on modern demands; - achieving logical coherence in addressing topics related to ecological education in curricula; - forming a strong composition of experienced professionals and faculty members to conduct class activities; - relying on advanced international experiences; - establishing a reservoir of ecological staff.
	In extracurricular education	<ul style="list-style-type: none"> - inclusion of tasks specified in the concept of sustainable development education into the educational programs of the circles; - establishing the activities of educational circles for sustainable development; - study and analysis of ecology and local studies curricula; - enriching the content of educational programs with activities and tasks that increase children's interest and are directed to independent ecological research; - development of effective mechanisms for increasing the involvement of children in the relevant areas of extracurricular educational institutions.

3 Discussion

Based on the above analysis, it is essential to emphasize that providing ecological education grounded in mutual fulfillment and interconnectedness in a comprehensive education system enhances the level of development of ecological literacy, ecological culture, ecological competence, and ecological stewardship among the younger generation.

During this process:

- prioritized guidance for education and upbringing;
- learning about ancestral heritage;
- attention to national identity;
- integration of national and foreign experiences into national customs and practices;
- organizing practical activities effectively;
- collaboration in various festivals and events;
- Creating ecological projects.

As a result of effective utilization of pedagogical and psychological guidance, as well as innovative educational technologies, such as:

- emphasizing adherence to principles based on the suitability of education and upbringing, fostering students' self-respect based on attitudes towards life;

- preserving one's boundaries in students through personal examples, models, and lessons from life;
- solving personal projects, individual and group situations in lessons and extracurricular activities using interactive methods, developmental, reflexive, and role-playing games to cultivate a love for nature.
- Achieving the development of social activism, communicativeness, information literacy, national and civic competencies in students.
- The systematic development of ecological competence in students is achieved through a chain-like structure of complete mastery (refer to the 2nd image).



Fig. 2. Structure of development of environmental competence of students

To instill a sense of love and affection towards nature in students and further enhance their ecological upbringing, it is necessary to pay special attention to strengthening the role of mass media outlets and television channels, organizing special ecological programs, and publishing periodic publications dedicated to environmental protection.

The main task in front of the teacher is to ensure the integration of subjects in order to develop activities for assessing students' own and peer activities, to guide them towards acquiring ecological knowledge, skills, attitudes, and life competencies in a manner appropriate to their age, and to ensure the coherence of theoretical and practical sciences. It is also crucial to foster the development of ecological culture and upbringing in students at every stage.

In this regard, each student should possess at least a minimum level of ecological awareness, ethical principles, and knowledge of ecological culture. This content should not be imposed as an external requirement but should be integrated naturally into the subject matter. This approach ensures the formation of the necessary skills, knowledge, and competencies for students to acquire ecological education.

Students' initial acquisition of ecological knowledge begins within the family and gradually progresses. Students, within the framework of all educational processes, additionally engage in:

- conserving and purifying water;
- understanding the importance of the atmosphere and its preservation;
- making judicious use of land resources and subsoil wealth;
- preserving the plant and animal world;
- collecting and disposing of waste materials.
- contributing to the preservation of Uzbekistan's beautiful and unique nature;
- actively participating in the preservation of the natural environment in their own village (city);
- acquiring comprehensive information about Uzbekistan's reserves and natural sites and understanding their importance;
- participating in projects aimed at conserving nature;
- protecting their own heritage;
- engaging with ecological issues through information obtained from internet networks, showing interest in initiatives aimed at addressing emerging ecological challenges worldwide, and ensuring their participation in relevant events;

- acquiring general knowledge and skills about the Aral Sea crisis.

It is known that the topics based on which ecological education and upbringing are provided in the content of general education school subjects include:

“Domestic animals and birds”, “Wildlife”, “Reserves, forests, the flora and fauna of regions”, “The Red Book of the Republic of Uzbekistan”, “Combating and preventing harmful organisms”, “Adhering to healthy lifestyle standards”, “Ecology and life”, “Preserving the atmosphere and water”, “Conservation of nature and its resources”, “Preserving biological diversity and enhancing it”, “Preventing environmental pollution by waste”.

By filling these topics in an integrative manner, providing ecological knowledge to students, it offers them the opportunity to develop ecological skills simultaneously. As a result, students develop life skills aimed at ensuring the development of nature and society (refer to Table 2).

Table 2. Integral and Continuous Content for Providing Ecological Education in the Content of Textbooks for Grades 1-11.

Subjects	Ecological education content integrated into subject matter
In subjects related to music	Learning and singing songs about the preciousness of nature just like their parents.
In subjects related to arts	observing and depicting natural landscapes; identifying and drawing the rarest and endangered species of flora and fauna from the Red Book of the Republic of Uzbekistan; understanding the negative consequences of harming nature, including dumping waste in unspecified locations; strengthening love and affection between humans and nature; depicting scenes related to global ecological issues.
In subjects related to the fundamentals of state law	The provisions of the Constitution of the Republic of Uzbekistan regarding the protection of ecology and the environment; The Law of the Republic of Uzbekistan “On Environmental Protection”.
In subjects related to the fundamentals of economic science	The necessity of adhering to ecological requirements in implementing entrepreneurial activities; The existence of separate payment systems for environmental pollution.
In subjects related to the fundamentals of chemistry	Substances depleting the atmosphere and ozone layer and their aspects; The negative impact of substances in industrial and household waste on nature when they are disposed of.
In subjects related to the fundamentals of biology	Rare and endangered species of flora and fauna listed in the Red Book of the Republic of Uzbekistan; The diverse flora and fauna in Uzbekistan’s forests and nature reserves, including various species of plants and animals, and their habitats; Ecosystems, their significance, and natural preservation of ecosystems.
In subjects related to geography	topics, necessary knowledge, and information regarding the description of protected natural areas are included.

4 Results

The “Concept for the Development of Environmental Education in the Republic of Uzbekistan” has found its reflection in the way ecological education is implemented in the general education system, as indicated in the table of contents. The systematic organization of environmental education in Uzbekistan aims to foster ecological competence among students by integrating related topics in a coherent and interconnected manner. It serves as a methodological basis for developing environmental literacy and culture among youth, further advancing the field of ecology through innovative technologies, and enhancing young

people's love for and understanding of nature. Additionally, it contributes to instilling a sense of responsibility towards our homeland's environment, promoting eco-consciousness, and enriching the ecological culture of young individuals.

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