

Master's Program Module "Environmental Issues - Decision Making Experience" as Precondition for Implementation of Education for Sustainable Development for Professional Training of Teachers

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ABSTRACT

The article discusses current issues related to the implementation of the UNESCO roadmap implementing Global action programme on education for sustainable development. In the context of increasing the professional level of pedagogical workers is a priority area in the implementation of education for sustainable development. Therefore, we believe that the proposed by the authors master program "Environmental issues: the experience of decision" meets the objectives of the global action programme on education for sustainable development. The article substantiates the relevance of the topic, States the purpose, objectives and structure of the module, corresponding to different dimensions of sustainable development. Presented technology training that provides the development of cognitive competence (development of thinking), axiological (values, capacity for partnership, tolerance, empathy, pluralism) and the activity of nature. This corresponds to the competences, proposed by the UNESCO Commission. It defines and explains the educational outcomes of a module of master's program "Environmental issues: the experience of decision-making".

KEYWORDS

education for sustainable development, road map for the implementation of the global programme of action, vocational education teachers, master's program, educational module, objectives, tasks, structure, technology, educational outcomes of the module.

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1. Introduction

The modern global problems threaten the civilization fundamentals and require adequate consolidated actions focused on sustainable development. Education for sustainable development is the most efficient tool, which the society has to meet the global challenges. It is the education that will shape the

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world tomorrow. In 2005 recognition of the highest priority of the education in building of better and more sustainable future resulted in declaration of the Decade of Education for Sustainable Development. In 2014 UNESCO developed a Global Action Program (GAP) on Education for Sustainable Development, which was supported by a detailed Road Map of its implementation (UNESCO, 2014). The Education for Sustainable Development has the most important mission, i.e. to foster knowledge, values, actions, competences, experience, which provide for solving of problems of vital importance for successful existence of people. Environmental problems constitute one of the key elements of global challenges. Therefore, the education focused on gaining of environmental problem solving experience makes the core of the Education for Sustainable Development. The environmental problem solving education is education targeted on the future, problem-based by its content, and focused on fostering of environmentally significant properties and qualities of individuals, such as environment-friendly mentality, eco-humanitarian system of values, environmental adequateness, and environmental responsibility. All such properties and qualities of individual determine gaining of environmental problem solving experience, which in its turn includes cognitive, axiological and praxeological aspects.

The relevance of the problem-based integration of content was in due time foreseen by the member of the Academy of Sciences V.I. Vernadsky, who remarked that “in the nearest future we will focus on problems rather than sciences” (Vernadsky, 1991).

Such education is especially important for training of teachers. Moreover, the Road Map underlines that the most critical bottleneck of the Education for Sustainable Development promotion is incompliance of an educator (teacher, lecturer) with the requirements of the innovational education (UNESCO, 2014).

The analysis of various studies in the area of pedagogical education (Alekseev, 2014, Vinokurova, 2000, Ermakov and Suravegina, 2005, Ermakov et al., 2002, Zakhlebnyi and Jatkovska, 2014, Zverev, 1995, Mamedov, 2014, UNESCO, 2013, Chumakov, 2006, Boekhout, 2009, Goldman, 1999, Sterling, 2001, Liaison Group Learning and Teaching Scotland, 2004) revealed the following significant problems existing in training of the pedagogical staff:

- a pronounced trend for the object focus, which trespass against principles of the integral perception of environment, leads to fragmentation of social and natural environment, its problems in the trainee’s mind, and represents a cognitive barrier to adaptation to living of natural conformity in eco-adverse environment;

- insufficient attention to problem-focused development of the content, which creates potential opportunity for implementation of consistently pragmatist, person-centered, culturological approaches as primary methodological grounds for restructuring of the educational system in Russia and abroad;

- inability of the mass-school teacher to use innovational technologies of integrative, problem-pragmatist nature, which contradicts to global and domestic education development strategies of the XXI century.

The training module of “Environmental issues – Decision making experience” master’s program is focused on overcoming of the above mentioned contradictions.

Long-term studies of Nizhny Novgorod school of sciences on environmental education (Vinokurova, 2012, Vinokurova et al., 2016, Vinokurova et al., 2015, Vinokurova et al., 2014, Krivdina, 2012, Krivdina et al., 2012, Mamedov et al., 2015) were used as theoretical and methodological basis for development of this training module of the master’s program. Analysis of regulatory documents, as well as status of preparation of the pedagogical staff for the environmental education as an important component of the educational philosophy focused on the sustainable development was also used as a basis for the target-oriented, comprehensive, procedural and effective content of the module.

2. Results

“Environmental issues – Decision making experience” educational program module is an individual part of “Education without borders” program of “Pedagogical education” area for graduate students, which provides for academic mobility of students of pedagogical higher educational institutions under conditions of network communication.

The objective of the module is creating proper conditions for development of professional pedagogical competences of the graduate students in studying and solving of environmental problems as a new social reality of a special area of the problem-based environmental education. The following tasks shall be fulfilled to achieve the mentioned objective:

1. Create conditions for development of a system of problem-based environmental knowledge with trainees as a cognitive basis of environmental problem solving education.
2. Foster development of the trainees’ environment-friendly mentality as intellectual mechanism (tool) for environmental problem solving by means of research and designing activity.
3. Provide conditions for development of the trainees’ eco-humanitarian system of values as a motivational basis for creative activity for the benefit of harmony of the human-nature relations.
4. Contribute to development of the trainees’ readiness to use their knowledge on environmental problems and their solving in the future environmental education practice.

The structure and content of the module represent a mix of academic disciplines and practical trainings, subject to hierarchy and variability principle, development of individual educational path, situationality and productivity of training and educational self-analysis principle. The training module of “Environmental issues – Decision making experience” educational program includes basic disciplines and elective courses ending in a system of practical trainings (table 1).

Table1: Structure of training module of “Environmental issues – Decision making experience” program

Training module components	Disciplines and practical trainings
Basic disciplines	Environmental challenges and educational mission Environmental problem solving education
Elective courses Block 1. Intellectual and moral basics	Ethics of environmental responsibility Modern landscapes - Esthetics and design
Block 2. Instrumental and pragmatist basics	Environment-friendly mentality Decision making training
Practical course	Practice of meta-object immersion in the environment Practice of pedagogical engineering of environmental problem solving

The basic component of the training module professional cycle is composed of “Environmental challenges and educational mission” and “Environmental problem solving education” disciplines. They are focused on development of the trainees’ readiness to use the experience of environmental problem solving in their educational practice from the point of cognitive, axiological and praxeological aspects. Implementation of the basic component allows the trainees to develop motivation for environmental problem studying and solving at various hierarchy levels, to create conditions for development of eco-humanitarian system of values as motivational basis for creative activity, and reflect ideology of the sustainable development.

The personal educational increment of the graduate students at that stage of training includes not only the basic knowledge system, but also understanding of personal environmental responsibility and development of practical approaches to the environmental problem solving education using state-of-the-art pedagogical processes. Application nature of the basic disciplines is expressed in development of the graduate students’ experience in designing and engineering of environmental problem solving methods in a specific environmental situation at the global, national and local level; practical implementation of eco-humanitarian system of values when choosing and making decisions under artificially simulated and real environmental conditions.

The variable part of the module is built by two blocks of application disciplines, i.e. “Intellectual and moral basics” and “Instrumental and pragmatist basics”.

The first variable block (“Intellectual and moral basics”) deepens the axiological aspect of geo-environmental knowledge using two disciplines, i.e. “Ethics of environmental responsibility” and “Modern landscapes - Esthetics and design”. The first discipline creates conditions for development of responsible attitude to human-environment relation problems based on standards of moral & ethical self-consciousness of the individual. The educational outcome of the discipline is readiness and ability of the graduate students to use their decision making experience related to environmental problems of various scopes in the environmental educational practice; responsibility ethics: from internal personal changes to global changes, responsibility and care for future generations.

The second discipline (“Modern landscapes - Esthetics and design”) is designed for development of professional pedagogical competences in the area of learning of esthetics and design of the modern landscapes as a new social reality focused on mastering of the system of knowledge and practical skills in landscape design. The graduate students master the methods of structural and functional layout of objects in the landscape design; carry out visualization of their design solutions using computer software; make cost estimates of various projects and properly select the work material for the garden art facilities of various sizes and applications; master the computer software used in the landscape design.

The second variable block “Instrumental and pragmatist basics” has mainly praxeological nature, and includes such disciplines as “Environment-friendly mentality” and “Decision making training”.

Mastering of “Environment-friendly mentality” course results in the environment-friendly mentality itself that is acquired by the trainees as an intellectual mechanism (tool) for environmental problem solving. Learning of the discipline provides mastering of the modern technologies for development of the environment-friendly mentality based on solving of simulated and real environmental problems.

“Decision making training” course develops trainees’ competences in study of environmental problems of global, national and local character at the level of conscious making of environmentally reasonable decisions and their implementation in the practice of life. The graduate students get subjective experience of practically pragmatist and emotionally axiological attitude to the world based on the “data bank” on scientifically grounded methods of decision making; develop criteria and strategies of environmentally reasonable action management; obtain skills to evaluate contextuality and efficiency of the decisions made.

Practical activities of the graduate accompany the entire training process, however, the students have opportunity to demonstrate their skills under real conditions and to feel involvement in the real professional problem solving during two practical courses, which end the training module. Those practical courses require from the trainees to update, streamline, summarize and implement their accumulated experience and knowledge (Krivdina, 2012).

Research and development practice of meta-object immersion in the environment creates conditions for implementation of the global environment-friendly mentality in studying and solving of environmental problems by means of research and development activity, which fosters development of the trainees’ competences in the area of environmental problem solving in the real environment.

The practice of pedagogical engineering of environmental problem solving make the trainees to dive deep in the real educational environment of an educational institution and contributes to development of professional pedagogical competences. The graduate students perform functions of both trainee and trainer under conditions of an educational institution (school, lyceum, gymnasium, college), and master modern processes of teaching students to solve environmental problems (Krivdina et al., 2012).

Educational outcomes of the module

The educational outcomes of the training module of “Environmental issues – Decision making experience” program represented by cognitive, practical and pragmatist, methodological, axiological and semantic components are represented in Table 2.

Table 2: The educational outcomes of “Environmental issues – Decision making experience” training module

Educational outcomes			
Cognitive	Practical and pragmatist	Axiological and semantic	Methodological
Demonstrate knowledge of causes, essence and possible solutions of environmental problems in artificially simulated and real environmental situations as the key conceptual result of the human life and activities in the environment	Develop and engineer methods of environmental problem solving in a specific environmental situation of global, national and local level	Demonstrate eco-humanitarian system of values when choosing and making decisions in simulated and actual environmental situations	Demonstrate readiness and ability to use experience of decision making on environmental problems of various scopes in the environmental educational practice

3. Methods and Techniques

Implementation of a system of innovational technologies for comprehensive use of scientific and educational potential of the real environment, to develop environmentally important personal qualities – provides efficient achievement of the educational outcomes of the master’s program module.

The technology of meta-object immersion is focused on organization of such trainees’ activity where they do not only learn something new, but also implement their experience and knowledge, obtain and realize their personal results. The key element of the technology, according to A.V. Khutorskiy, is a heuristic educational situation. Its objective is “creation by the trainees of their personal educational products, i.e. ideas, problems, assumptions, versions, diagrams, experiments, texts”. That is why the educator tries to achieve not just mastering of the “lectured materials” by the trainees, but their personal creativity under conditions created by the teacher in the meta-object immersion (Khutorskoy, 1995, Khutorskoy, 1998). In the course of such immersion the trainees master a system of multipurpose modes of action, using which they will be afterwards able to master new knowledge and skills. This technology is mainly implemented by means of practical training.

Critical thinking development technology is implemented during learning of “Ethics of environmental responsibility”, “Environment-friendly mentality”, “Decision making training” disciplines. The technology is based on achievement of such educational outcomes as ability to work with constantly growing and changing information in the area of environmental problem studying and

solving; ability to form and clearly and confidently express an opinion about surroundings in a tactful manner; ability to develop an opinion based on understanding of various experience, ideas and images; ability to solve problems; ability of self-study (academic mobility); ability of cooperation and team work; ability to build positive relations with other people.

Case study technology within the limits of the represented module inspires development of individual models of behavior and way of thinking based on analysis of real and artificially simulated environmental situations of various hierarchy levels, i.e. global, regional and local ones.

Foresight study is focused on prediction of assumed future changes by means of analysis of all possible development scenarios of existing environmental situations, identification of events and processes, which will become dominant in the future. The foresight provides for deeper understanding of the nature of changes, problems and opportunities. The foresight allows us to simulate the future ensuring sustainable development.

Decision making technology is a core of the developed training module, since it complies with the key objective of the program, i.e. to create conditions for the trainees to develop professional pedagogic competences in the area of environmental problem studying and solving. Decision making requires an in-depth study of all aspects of the problem occurrence and solving, as well as answers to the following questions: What are causes of its occurrence? What should be done? What are the costs? How it should be done? Who should do it? When it should be done? For whom it should be done? Where it should be done? What are the results and effects? The technology inspires development of a conceptual model of a problem situation and assumes representation of the problem understanding, and system of views on a specific environmental problem in general.

Conclusion

The above mentioned system of methods provides for comprehensive impact on cognitive, affective, volition qualities of individual and effective development of the graduate students' system of problem-based environmental knowledge, environment-friendly mentality, eco-humanitarian system of values, and for achievement of the said educational outcomes for the benefit of sustainable development.

Research perspectives for the problem assume the following:

- a) review the problem of motivation of the pedagogical staff for further educational training for sustainable development;
- b) develop methodological aids for the training module, including text-books, work-books for the trainees, etc.;
- c) review pedagogical aspects of introduction of sustainable development principles in classroom disciplines of schools and professional pedagogical educational institutions;
- d) provide continuous professional training of pedagogical staff in aspects of education for sustainable development.

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