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Innovations in ecological education of higher school students

Problem

The emphasis of education shifts from learning in general (cognitive paradigm) to its quality, efficiency, harmony (competence paradigm) now. A significant factor in the transition to education for sustainable development and enhancement of environmental education is implementation of effective educational management and audit, independent monitoring [Beljavskiy 2008: 5], without which it can operate each coherent structure as a living organism can not operate without feedback from the environment.

The educational research in technical universities (aviation, construction, engineering faculties at the University „Ukraine”) has shown enough maturity high current students to broaden and deepen environmental training, formation of ecological expertise for the practical implementation of modern environmental imperative tasks in technical field and transition to development of education for sustainable development, a decade which has entered into its final, third stage, according UNECE strategy.

Analysis of recent research and publications

The purpose of environmental education is the formation of ecological thinking, worldview, ecological culture, which can be implemented by system, continuous, comprehensive studies through the introduction of modern innovative technologies. Before environmental education, which today plays an important social role in a move towards a balanced development, noospherohenezys, achieving this goal can with the support of innovative teaching technologies [Sayenko 2008: 225].

In the context of ecology-creative training of future specialists in university educational technology innovation designed to develop students' competence, creativity, tenacity, flexibility of adaptation. New skills that are formed by such organization of educational process in the future may become a specific professional activities with high environmental content. However, outside the active attention of researchers remains the question of development and implementa-

tion of innovative technologies in the content of environmental education, particularly in high school technical direction.

The problem of systematic introduction of independent learning activities (ILA) in the process of solving environmental education of university students, including training of future specialists technical profile, remains open. ILA is specific, with its inherent principles, approaches, through which the teacher ceases to be the only source of information, and is co-creator of personal learning pedagogy dominated by cooperation, openness, trust between teacher and student. It increases motivation and interest both for creativity, research skills formation in conditions of ecological crisis, which is one of the pressing problems of modern education in general.

At the present stage of socio – economic development must take precedence over scientific-research, in fact, ecological – creative activity of students and teachers, and leading the task of each institution, especially the higher should be the formation of integrated, harmonious personalities of both students and teachers in the process of scientific – pedagogical activity. In domestic pedagogy approaches to self-study investigated long ago, but the results of these studies have not acquired sufficient spread in the educational process through a series of subjective and objective factors, among which are:

- Reproductive style of teaching and learning, based on the division of responsibilities between teacher and student: teacher reports, student – remember, responsible;
- Knowledge management system aimed at determining reproductive abilities, while, as the ability to generalize, organize, draw conclusions, use the knowledge in problem situations, establish cross-curricular approach and internal substantive relationships, the presence of logical thinking, remain outside the system of evaluation. Therefore, an important question remains active involvement of university students to research and creative activity, which is kind of independent learning activities, interactive teaching methods, including „brainstorm”.

The main material

To increase the effectiveness of training activities play an important role of organizational and pedagogical measures:

- A system of psychological and educational factors that can encourage creativity, focus on personal characteristics of students, systematic work, providing self-study cognitive, communicative culture;
- Performance monitoring and evaluation of students based on cooperation, co-creation, contributing to the strengthening and development of interest in learning.

These activities allow you to work strenuously for a pace mode, solve the problem. Generalized scientific and educational literature, personal experience allowed to determine the feasibility of using different types of independent

learning activities in the process of solving environmental and creative training of university students technical direction:

- Research, laboratory and practical work, reports the results of practice, comprehensive essays, articles, independent work, preparing for debates, „brainstorm”, „round tables”, preparation of the ecological section to course- and diploma works.

In the created models of ecological and creative training of university students of technical profile, special attention was paid to the development and implementation of the learning process of innovative technologies that involve the use of active methods of mastering the material. It is known that its use of such species as business games, discussions, „brainstorm”, „round tables” considerably increase the efficiency of learning the content of environmental education and promote formation of an ethical attitude to the environment, humans.

In the dialog (polylog) study relies number of tasks, including the skills to conduct constructive discussion, to raise the culture of communication and the formation of skills:

- express and defend their own point of view;
- ask questions correctly and ethically apply the replica;
- defend their own opinion with the teacher, colleague, opponent;
- create a culture speech, debate, communication;
- work in a team.

Problems with the discussion (dialog, polylog) is a didactic guide in the learning process. These results of stating experiment have showed how urgent environmental problems include a discussion of almost 100% of its participants, and less important questions are asked to actively work only 60–70% of students.

Important role in conducting a „brainstorm” is the teacher – the organizer and leader of this educational activity that: Defines the topic, prepare questions, provides instruction, specifies the source of information, responsible speakers (if necessary), invited observers and experts on this issue, veterans of the industry. There are cases during the discussions when due to a stress condition that occurs in the speeches, incorrect statements, insensitive questions, intellectual and emotional atmosphere of the event becomes aggressive, negative, unfavorable for a constructive dialogue. The teacher should be able to return the discussion in a positive dimension in such cases to achieve goals and solve specific problems.

The discussion learning, including „brainstorm”, played a significant role in the formation of ecological thinking, consciousness, ethics, culture and, from our point of view, this educational activity should be given special attention in ecological-creative model of students of technical specialties. Developed by us textbook „Ecology” contains a number of themes used for discussion debate, particularly in the topic „Ecological problems of modernity”:

1. Your personal contribution to overcoming environmental crisis – global, regional, local – yesterday, today and tomorrow.

2. The comparative nature of domestic and Western European environmental legislation: reality and prospects.
3. Military Sector and Environment.
4. The militarization of countries in the light neo-spherohenezy.
5. „Green” technology – a course to „green” policy.
6. Where are the boundaries of sufficient ecological consumption?
7. The facts about the state of environment – classics, periodicals, personal experience.
8. Measures to preserve of environment – examples, tools, technologies.
9. Successful environmental action of communities in the world and in Ukraine.
10. Interaction of human (society) and nature as a problem of belief and consciousness.
11. Ecological crisis – a crisis of man-centered consciousness.
12. Do I need to ecological or environmental education today, tomorrow and in what extent?

For the Concept of ecological education in Ukraine or Concept (Strategy) education for sustainable development necessary to develop and implement a system of national monitoring and evaluation of educational scope of its discussion in society, the governing structures of the state to improve the functioning and effective long-term management [Sayenko 2008: 212]. It is proposed to apply two types of monitoring: 1) monitoring implementation, 2) monitoring effectiveness. Monitoring of implementation determines the state of performance of planned activities. Monitoring effectiveness determines the level of achievement of planned results. A measure of success is effectiveness (better results at lower cost). Both types of monitoring are interrelated and important, but the appraisal process should start with monitoring implementation.

The performance scheme of the monitoring system can be followed: it's formulated a common vision – strategic objective, it's defined goals and developed of the appropriate indicators. The tasks – the obligation of quantitative and qualitative, for example, increasing the number of hours on environmental subjects at university by 20% that must be implemented over a period, they say, in 5 years. That is, it's set some benchmarks (indicators) for implementation of events and results. The indicators used to measure of achievement of the required tasks.

List of indicators is specified and approved by the relevant ministries, departments, departments of education at all levels, then each link formal and informal education is monitored by established indicators, using the information from reports. The reporting system must be effective, since it registered with the work of all educational institutions and organizations responsible for implementing the Concept of ecological education and Program of it implementation. It can be developed taking into account the experience in implementation of Environmental Action in Europe.

Conclusions

The relevant sets of indicators should be developed for each goal and objective Concept of ecological education in Ukraine, the Concept of the national system of education for sustainable development, ie, **in creating a system for monitoring ecological education** and evaluation of its impact on the society should use a set of indicators for each definite levels: national, regional, local, and for each university, school, project, initiative, etc. Without a monitoring system, any Concept or Plan of action will not be implemented and remain just good intentions. Ukraine currently lags behind European countries in the implementation of the principles of sustainable development and education for its development. The main reason for this is insufficient attention to the monitoring system in the state and education in particular, as an important means of feedback, effective governance and management factor.

Literature

- Beljavskiy G.A. (2008), *The state of environmental education in Ukraine // Shamrock* (environmental newspaper Ukrainian Society for Nature Conservation), № 3, July 2008, p. 4–5.
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Abstract

The ways of modernization of ecological or environmental education in high school during the competency paradigm and final phase of the Decade of Education for Sustainable Development (2011–2014) were discussed.

Key words: monitoring of ecological or environmental education, education for sustainable development; information society.

Innowacje w edukacji ekologicznej studentów

Streszczenie

W artykule omówiono sposoby modernizacji procesu kształcenia przez edukację ekologiczną w szkole jako paradygmat rozwoju kompetencji w końcowym etapie Dekady Edukacji na rzecz Zrównoważonego Rozwoju (2011–2014).

Słowa kluczowe: monitoring edukacji ekologicznej i ochrony środowiska, edukacja dla zrównoważonego rozwoju; społeczeństwo informacyjne.