A COMPREHENSIVE PRACTICAL TRAINING PROGRAM FOR STUDENTS IN THE FIELD OF ECOLOGY AND ENVIRONMETNAL SCIENCES

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Abstract

There has been prepared the comprehensive program of practical training of ecology students for higher agricultural education establishments; identified key components, founded the content, designed the program structure allowing for the industry specifics.

Key words: program of practical training, ecology students, practices.

KOMPLEXNÍ PRAKTICKÝ VZDĚLÁVACÍ PROGRAM PRO STUDENTY V OBLASTI EKOLOGIE A ENVIRONMENTÁLNÍ VĚDY

Resumé

Byl připraven ucelený program praktické výuky ekologie studentů na vysokých školách zemědělského typu; byly identifikovány klíčové komponenty, založené na obsahu, určeném programovou strukturou, která respektuje specifika průmyslu.

Klíčová slova: program praktické přípravy, studenti ekologie, praxe.

Problem statement

Various aspects indicate that the educational system in Ukraine requires a lot of attention from scientists who may contribute to improve it. These aspects are outdated technologies applied in educational processes, non-compliance of educational programs with nowadays requirements and lack of cross-cutting programs in the field of practical trainings, out-of-date materials and non-sufficient enough trainings. All the above contribute to a failure of the graduated students to succeed in labour markets. Practical trainings in the educational system play one of the most important roles in the formation of highly qualified environmental professionals (graduated students or graduates) who are able to respond to the current needs of the industrial and environmental sectors.

An overview of the recent scientific research

Conceptual approaches in development of professional and practical trainings are presented by Yu. Doroshenko, L. Nichuhovska, A. Markov, V. Petruk, S. Sysoieva, L. Tarhan [7]; methodology and content of professional trainings in higher agricultural education institutions have been considered by R. Babalova, A. Bohomolov, M. Bosko, V. Borysov, P. Luzan, D. Mazorenko, O. Mitriasova, V. Sydorenko, L. Tishchenko; theory, methodology and practice of environmental education and education for sustainable development are given by M. Drobnokhod, M. Klymenko, V. Nekos, H. Biliavskyi, V. Sobchyk, O. Pometun, O. Sozinov, S. Stepanenko, N. Tverezovska [1, 8]. One could argue that the issue of developing a comprehensive program of practical trainings for students in the field of ecology and environment does not have enough attention. This article, therefore, aims to fill in this gap.

Research objectives

The purpose of the article is to develop a comprehensive program of practical trainings for students in the field of ecology and environment. To achieve this purpose the following tasks were set: to identify the main components of a comprehensive program of practical trainings, to justify

the content of this program, to develop the structure of the program with regard to the main characteristics, which have been identified.

Results and discussion

Development of a comprehensive program of practical trainings for students in the higher education with specialty 6.040106 “Ecology, Environmental Protection and Sustainable Use of Natural Resources” is based on the following aspects: (i) the need of fundamental changes aimed at improving the quality and competitiveness of education; (ii) creating conditions for sustainable development of higher education with a combination of innovate and flexible training programs and research activities; (iii) improvement of cooperation between employers, students and higher education authorities during studying and research to form interdisciplinary innovative skills in students, which will enhance their personal professional levels. The program should determine innovative methods to implement practical trainings in higher educational programs for future specialists through synergies (combination of foreign and domestic technologies, innovations, techniques, methods) and integration of national education system into the European and world education platforms.

Implementation of the strategic program of a comprehensive practical training in "Ecology, Environmental Protection and Sustainable Use of Natural Resources” program should be oriented at 5.5 years (4 years – “Bachelor” degree, 1.5 years – “Master” degree) based on the requirements of the industrial course description. The main objective of a comprehensive program of practical trainings for students in the field of ecology and environmental sciences is to increase the level and availability of high-quality practical trainings in accordance with the requirements of economic development in the country, as well as to address important social and environmental problems by professionally trained specialists who are able to adapt and self-improve in a y professional environment. In the developed program we took into account the requirements of the National Strategy of Education Development in Ukraine for 2012-2021 [7] and the National Doctrine of Development of Education. We did it in a way of trying to modernize the practical trainings for students in higher educational institutions. To this end, the program includes: updated the scientific-and-methodological, material-and-technical and human resources during the practical training of ecology students; integrated the national education system into the European platforms with introduced innovative methods for practical trainings; improved the structure and content of educational, production, teaching practices based on scientific, innovative and research activities of the students, including international mobility. The strategic program should take into account the interests of all involved parties, such as employers, educational authorities and students. Based on the above mentioned information, the main features that determine the properties of developing a comprehensive program of practical trainings include: *focusing* on achieving the goal through a combination of research and innovation in order to facilitate the practical implementation; *consistency* and *comprehensiveness* of all types of practice; *integrity* of professional-and-practical training based on the content of future exercises of the profession; *flexibility* of training programs and research activities through international partnerships; gradation, continuity, cross-cutting nature of practical trainings; efficiency (meeting the needs of all interested parties). Schedule 1 shows structural elements and indicators of the strategic training program.

Schedule 1. Structural elements and indicators of the strategic program for comprehensive practical trainings

Structural Elements	Indicators
Contents [2, 3, 7]	concept, strategy, objectives of the program
Flexibility of practical trainings, research and international mobility [7, 5, 9]	concepts, strategy of environmental policy, strategic courses of development of environmental education; challenges and risks of developing practice-based learnings with the introduction of innovative methods; future challenges of modernization of the practical trainings for students in the field of ecology and environment; developing own pathways for practical trainings and research work
Scientific and methodological support of practical trainings [6, 8]	Modern (innovative) methodology of research in the field of environmental quality; innovative techniques, methods of educational, production, teaching practices, research practicums; innovative methods, techniques, methodology of practical, scientific and research, planning-and-surveying scientific research in ecology and environmental sciences; textbooks, manuals, guidelines, workbooks and journals for practitioners; cross-cutting practice programs; working programs for practices
Regulatory support of practical trainings [3]	National and international regulation in education and environmental protection; provisions on organizing educational processes in the higher education; provision on training students of agricultural universities of Ukraine; guidelines on developing and implementing programs for training students of the higher education of Ukraine; agreement on strategic partnership between university, employers and other institutions
Standards for practical trainings based on types of practices [4, 6]	State Standard of Ukraine DSTU-P IWA 2:2007 "Quality Management System. Guidelines concerning the ISO 9001:2007 in Education"; industry higher education standards for training professionals in specialty "Ecology, Environmental Protection and Sustainable Use of Natural Resources"
1	*2*
Human resources for practical trainings [3]	Science and academic workers who are experts in innovative research methods, forecasting (scenario analyses), expert-and-control, environmental management and in other scientific environmental research, have international internships and they regularly increase their qualifications
Financial support of practical trainings [3]	Costs of material and technical means and energy to carry out practices; joint participation of teachers and administrators in international education and different research projects; travel expenses; costs of different means such as rooms and boards at the venue of practices; compensations of executives by higher education authorities
Material and technical base of implementing practical trainings	Industry enterprises (agricultural, processing, food, environmental); environmental centres, environmental auditing agencies, laboratories for environmental monitoring, assessment, certification, environmental certification and licensing authorities, as part of the educational processes
Schedule of practical trainings for a cross-cutting continuous educational processes [2, 8]	Structural-and-logical profiles of practical trainings based on types of practice; list and duration of practices; structural-and-logical profiles of practical education; algorithm of gradual acquisition of professional practical skills; model of professional and practical competences of future specialists in ecology and environmental sciences

The content of training, production (pre-graduation), research, and teaching practices [8]	Objectives of each practice; basic provisions and duration of practice; stages and structure of practical trainings; framework of practical trainings; methods, techniques, standards, methodology of environmental studies; formation of professional and practical skills, abilities that students acquire during a certain practice in Ukraine and abroad, an internship in the field of future employment

The implementation of the developed comprehensive program for practical trainings for students in ecology and environmental sciences results in highly qualified specialists in ecology, environmental protection and sustainable nature, who are ready to perform professional research, design, manufacturing, expert control, legal and regulatory (Environmental standardization, certification and licensing), environmental educational, management tasks related to rational use of natural resources, prevention of pollution, introduction of environmental management and auditing systems, labelling, stimulating re-use, recycling and disposal of waste, prevention of natural and man-made disasters, development prospective and current plans and programs on environmental protection, and observance of technological conditions of environmental facilities. Schedule 2 provides the structure of practical trainings for future ecologists and environmentalists.

Schedule 2. Ratio of theoretical and practical trainings for specialists in ecology and environmental sciences

Theoretical training		Practical training	
Bachelor Degree			
Course of disciplines	ECTS	Names of practices (ECTS)	∑ECTS
Natural-sciences (basic) training	40	General-environmental courses: general biology, botany (2); virology, microbial ecology (1); geology with the fundamentals of geomorphology (1); meteorology and climatology (1); soil (1) hydrology (1); informatics and systemology (1); general ecology (1); tutorials in chemistry (1)	10
Professional practical training	60	*Landscape and environmental courses:* agroecology (2); radiobiology and radioecology (1); topography with the basics of cartography (1); production practice (6)	10
1	*2*	*3*	*4*
Selected by a student	21	Research workshop: environmental control in agrosphere (3)	3
Master Degree			
Professionally-oriented, humanitarian and socio-economic trainings	8,5	Teaching courses	2
Natural sciences, professional and practical trainings	22	Scientific and Production Courses	6
Selected by a student	18	Master thesis	12

Conclusions

We developed a comprehensive program for practical trainings for students in the field of ecology and environmental sciences. This program serves as a coordinating document that is a scientifically reasonable system of interconnected and implementation-oriented legal, scientific, methodological, human resources, financial, material and technical means, which are oriented towards practical trainings of the students based on innovative practical educational systems.

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