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TENDENCIES OF HIGHER EDUCATION DEVELOPMENT IN ECOLOGY

The article discusses the current trends in the development of higher education in the specialty «Ecology». At present, society acquires an information status, for which information and knowledge become key. In accordance with this, the paradigm of education also changes. Modernization of the education and science system in Kazakhstan implies accessibility to each quality education, the opportunity to acquire new professional skills in college and university, and develop research and creative competences. For higher ecological education, the most relevant is the formation of a student's culture of making environmentally appropriate practical solutions, experience of personal participation in solving environmental problems in order to improve the quality of the environment. At the same time, ecological competence as a developing personal property can and should become an indicator of the level of formation of egocentric ecological consciousness. The article presents practical experience in creating the educational program «Ecology» in English in the specialty 5B060800 – «Ecology».

Key words: continuous education, ecological awareness, educational program.

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Жоғарғы экологиялық білім берудің даму үрдістері

Мақалада «Экология» мамандығы бойынша жоғары білім берудің заманауи даму үрдістері талқыланады. Қазіргі кезде қоғам ақпарат пен білім негізгі болып табылатын ақпараттық мәртебеге ие. Осыған сәйкес білім беру парадигмасы да өзгереді.

Қазақстандағы білім беру мен ғылым жүйесін жаңғырту әрбір сапалы білімге қолжетімділікті, колледжде және университетте жаңа кәсіби дағдыларды иеленуге, зерттеу және шығармашылық құзыреттерді дамытуға мүмкіндік береді. Жоғары экологиялық білім алу үшін қоршаған орта сапасын жақсарту мақсатында экологиялық мәселелерді шешуге арнайы қатысып, тәжірибе алуы, экологиялық тұрғыдан тиімді практикалық шешімдерді қабылдауда студенттердің мәдениетін қалыптастыру аса маңызды. Сонымен қатар, экологиялық құзыреттілік дамушы тұлғалық қасиет ретінде экожүйелік экологиялық сана қалыптасу деңгейінің көрсеткіші ретінде болуы керек. Мақалада 5B060800 – «Экология» мамандығы бойынша ағылшын тілінде «Ecology» білім беру бағдарламасын жасау тәжірибесі енгізілген.

Түйін сөздер: үздіксіз білім беру, қоршаған ортаны қорғау, білім беру бағдарламасы.

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Тенденции развития высшего экологического образования

В статье рассматриваются современные тенденции развития высшего образования по специальности «Экология». В настоящее время общество приобретает информационный статус,

для которого информация и знания становятся ключевыми. В соответствии с этим изменяется и парадигма образования.

Модернизация системы образования и науки в Казахстане предполагает доступность для каждого качественного образования, возможность получить новые профессиональные навыки в колледже и университете, развить исследовательские и творческие компетенции. Для высшего экологического образования наиболее актуальным является формирование у обучающегося культуры принятия экологически целесообразных практических решений, опыта личного участия в решении экологических проблем с целью улучшения качества окружающей среды. При этом экологическая компетентность как развивающееся личностное свойство может и должно стать показателем уровня сформированной эгоцентрического экологического сознания. В статье изложены практический опыт по созданию образовательной программы «Ecology» на английском языке по специальности 5B060800 – «Экология».

Ключевые слова: непрерывное образование, экологическое сознание, образовательная программа.

Modern society moves from industrial status to informational, in which information and knowledge become a key resource. The qualitative transformation of society inevitably leads to the same change in education. It is the educational system that can solve the main problems of 21st century society (The Message of the President, 2012: 5).

Head of State N.A. Nazarbayev stressed that knowledge and professional skills are key benchmarks of the modern system of education, training and retraining of personnel; we should in the near future build a maximally pragmatic strategy of transferring the technologies necessary for the country. Education is one of the three main subjective factors of the human development rating. Kazakhstan as an independent, sovereign and competitive state in the context of new challenges of a complex and dynamically developing world has all the priorities that contribute to ensuring the high quality of education and science (The Law of the Republic of Kazakhstan, 2007: 15; the State Program, 2006: 22).

The new stage of modernization of the Kazakhstani education and science system implies accessibility to each quality education, the opportunity to acquire new professional skills in college and university, to develop research and creative competences. The younger generation is the locomotive of the future of the Republic of Kazakhstan. Therefore improving and accessibility of the education system for younger generation is an integral part of the education issues. Kazakhstan is on the way to the implementation of its strategic objectives, which means that the country is ready to give our youth the best education and decent work (Sabden, 2013: 72; Kazakhstan, 2017: 6).

One of the important problems of ecological education in the conditions of higher education, which is very topical today, is the formation of a culture of making environmentally sound practical

solutions, the experience of personal participation in solving environmental problems in order to improve the quality of the environment. At the same time, ecological competence as a developing personal property can and should become the indicator of formation an eco-oriented personality level, such as eco-centric ecological consciousness.

Currently, universities have made the transition to the European education system in the framework of the Bologna process. In order to improve the quality of education, it is necessary to take an example from our Western colleagues not only and not so much in the form of realization of this education, as in its content (ECTS, 2009: 46; The Rules, 2011: 18).

In this regard, it is very important to study the experience of foreign higher education, its comparison with the existing teaching practice of Al-Farabi Kazakh National University, identifying the feasibility of adapting the best world achievements to the real educational system.

In accordance with the agreement with the Ministry of Education and Science of the Republic of Kazakhstan on the development of educational programs in English for universities, teachers of the UNESCO Department for Sustainable Development have prepared a version of the educational program in English for the specialty 5B060800 – «Ecology».

To create this program, a group was formed, including teachers from foreign universities and domestic educational institutions, representatives of employers and partner organizations, in particular: Middlesex University, UK, Polytechnic University of Valencia, Reading University, UK, Nazarbayev University, the Republican Scientific Production and Information Center «KazEcology» and a number of others.

Priority areas for the development of an educational program in the specialty «Ecology» are:

– programs in the framework of the President's Messages, including those voiced in the text of the message «The Third Modernization of Kazakhstan: Global Competitiveness» (The National Framework, 2016: 14):

- interdisciplinary programs;
- programs in the English language;
- Joint educational programs with foreign partner universities;
- professional programs commissioned by enterprises-employers;
- programs using distance learning technologies, including programs of additional education.

The educational program is focused on the training of highly qualified specialists in the field of ecology, possessing certain knowledge and competencies in demand in the labor market.

The objectives of the educational program are:

- formation of a national model of continuing education integrated into the world educational space by comparison with foreign educational programs that meets the needs of the individual and society in the specialty 5B060800 – Ecology
- creating conditions for the development of creative potential, initiative and innovation;
- obtaining knowledge of the fundamental disciplines of environmental science with the subsequent informed choice of professional elective disciplines;
- acquisition of practical skills required by a bachelor-ecologist during the period of training and work experience;
- formation of competitiveness of graduates in the labor market;
- acquisition of a complex of knowledge that forms the basis of this profession, skills and abilities to navigate the flow of information and obtain new knowledge for continuing education in the magistracy and training in doctoral PhD.

The educational program is designed to provide high quality vocational education in ecology in accordance with the modern academic standards in the global educational space. A feature of the educational program is the ability to build your own learning path through the choice of disciplines.

The following learning paths are possible:

- environmental management and sustainable development;
- ecology and sustainable development.

In particular, this program provides an opportunity for academic mobility in the direction of the University of the Shanghai Cooperation Organization in universities in Russia and China.

We carried out a comparative analysis of the

content and experience of teaching subjects in the field of ecology for bachelors.

For a comparative analysis of this program, a number of foreign and domestic top universities were taken: University of Brighton, University of East Anglia, Imperial College London, University of York, Middlesex University, UK, Polytechnic University of Valencia, Reading University, UK, Nazarbayev University, the Republican Scientific Production and Information Center «KazEcology» and others.

The analysis showed that the disciplines of universities in the UK, like University of Brighton, University of East Anglia, Imperial College London, University of York, Reading University, UK are similar to the disciplines of our educational program, for example: Global environmental Issues, Human Evolution, Natural resources and Environmental, Health, Environment, Development, Society, Environment, Development, Society, Urban Ecology and the environment of the program are Global Challenges and Goals. Sustainable Development, Environment and People, Environmental Economics, Water resources management, Land management, Environment and sustainable development (Introduction to the profession), Industrial Ecology, Resource management, Environmental Chemistry, Biodiversity Conservation, Urban studies. As well as in leading foreign universities, the program provides for the inclusion of an innovative module «Applied Green Economy» with such disciplines as Renewable Energy, Green Technologies, which will change the students' thinking, provide conditions for independent creative work and strengthen the practical and technical focus of learning.

As in foreign universities, the presented educational program provides a fairly good knowledge base in fundamental disciplines. So, the educational specialty program is represented by cycles of disciplines – the cycle of general education disciplines (GED), the cycle of basic disciplines (BD), the cycle of major disciplines (MD).

General education disciplines are determined by the Model (main) curriculum (MC). They are mandatory for all students enrolled in the educational program.

The core and major disciplines are represented by a list of the required component and an optional component.

The obligatory component is defined by the MC. The component of choice is presented in the form of a list of academic disciplines in the Catalog of disciplines, recommended to students for the independent formation of an individual educational tra-

jectory (The model curriculum, 2013: 9; The Model curriculum, 2018: 6).

The component of choice is a list of academic disciplines offered by the university, agreed:

- with employers, which ensures the orientation of the training of specialists for a particular industry in accordance with the needs of the labor market;

- with graduate students, which allows us to take into account the assessment of the quality of the educational program as the basis of professional training for the main consumers of educational services.

The demand for graduates of educational institutions in the labor market is one of the most important indicators of the effectiveness of education. Close contacts have been established with potential graduate users at the regional and republican levels. The need for specialists in the field of ecology and environmental protection is experienced by industrial enterprises and production of different profiles, leading environmental protection activities and using natural resources (The state compulsory, 2016: 24).

In order to identify learning outcomes and graduates' competencies, an International Seminar was held to discuss the content of the modules of general education, basic, major elective disciplines, the development of a catalog of elective disciplines (CED), goals and objectives of the practice with the participation of foreign scientists: L. Landi – Dr., Prof. of Environmental Science, J. Quadrado – Dr., Prof., Vice President of the Porto Polytechnic Institute, Professor of the Hydraulic and Environmental Engineering department – Dr. Javier Rodrigo Ilarri a, A. Farino – PhD, Prof. of Environmental Science, Department of Basic and Applied Sciences, University of Urbino and others. Thus, based on the results of the discussion, the following innovative disciplines were proposed: Green Technologies, Waste Management Methods and Models, Sustainable Subsoil Use, Green Economy, and a number of others (Walsh, 2002: 64).

In teaching, it is proposed to use the best modern educational methods, including interactive teaching methods: business and role-playing games, trainings, discussions, round tables, debates involving a combination of individual and teamwork. Representatives of employers take an active part in the implementation of these forms of classes.

In accordance with ECTS Users Guide (2005) learning outcomes should be viewed as a statement of what is expected to know, understand and be able to demonstrate to the student after the learning process is completed.

Coordination of the project of competencies of the future graduate allowed defining qualification requirements in the format of learning outcomes. So, at the end of this program, it is expected that students will be able to: explain the basic patterns that determine the interaction of living organisms with the environment; modern concepts and strategies for the sustainability of human development; structure, subjects, dynamics of environmental change; the consequences of human activities on the environment; the main groups of pollutants, their migration, transformation and accumulation in ecosystems; chemical transformations of pollutants in the environment; identify the main hazards of the human environment; assess the risk of their implementation; justify the need for environmental monitoring and the use of environmental protection technologies; plan and manage environmental activities of enterprises; analyze the efficiency of environmental activities. In this case, the learning outcomes were used as a tool for developing a model of training programs (Walsh, 2002: 66).

Discussion of the Model (main) curriculum (MC) of the specialty and learning outcomes, the draft of the Ecology educational program allowed developing a passport and compiling an educational-methodical complex of disciplines of the Ecology educational program, which was approved by foreign and domestic experts.

Director of the Scientific Engineering Center of the National Engineering Academy of the Republic of Kazakhstan «Oil and Gas», Doctor of Chemical Sciences, Academician N.K. Nadirov stressed that the graduate of this educational program will receive a fairly good knowledge base in fundamental disciplines and suggested strengthening the module «Applied Green Economy» by including such disciplines as Renewable Energy, Green Technologies. He noted that it is necessary to change the thinking of students, to provide conditions for independent creative work, in connection with which the program should have a greater practical and technical orientation of training.

We believe that students with a bachelor's degree in environmental science will have a high level of English proficiency and will receive a very high level of understanding of the main environmental problems and are expected to be competitive in the job market for both private companies and public administration soon after leaving the university.

We believe that all innovative reforms of the strategic plan will further enhance the knowledge and improvement of professional skills among young people.

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