

## Development of Ecological Competence for Future Professions

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The purpose of this work is to study the problems of ecological education under the conditions of the transition to a green economy. The new economic reform changes the labor market. There is a huge gap between the demand of the labor market and the higher education system. The transition to a green economy requires new work places, new professions, new competencies and green skills. In Kazakhstan there are a number of problems for the transition to a green economy, conditioned by a deficit of competence, skills and specialists. The education system is actively developing ecological competence of future specialists. The need for a professional individuality of the future specialists with high ecological competence, professional competence, able to solve ecological problems independently expresses the actuality of the problem of finding a solution.

**Key words:** Green economy, Green Skills, Ecological competence.

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The concept of transition of the Republic of Kazakhstan to a “green economy” lays the foundation for deep systemic changes in order to transit to the economy of a new formation by raising the living standards, the lifequality of the population of Kazakhstan and entering the country to the 30 most developed countries of the world within minimization of the impact on the environment and degradation of natural resources.

European Strategy 2020 recognizes that the central role of the transition to a green economy isto achieve a progressive, stable development (COM, 2009; COM SWD, 2013).

Rapid changes, taking place in Kazakhstan, are even more fundamental under the conditions of the country. The fundamental concepts of education and economy are being

changed. Potentially ecological competence has great importance in the process of changes. They are an inseparable component in the educational standards of higher education.

The transition to a green economy will lead to the formation of ecological competencies and green skills. The work Canadian economist Peter Victor, quoted in “Prosperity Without Growth”, of the innovative report of the Commission on Stable Development, suggests that the economy, which is not approved with growth, can be stable, if the total and the average working time is reduced. As it was mentioned in his work, you can avoid unemployment, if you distribute the work among the population more equally. Less working hours means less pay, but growing number of more general green skills – do it yourself, gardening, cooking, animal industry, will vary with its neighbors through timebanks or Local Exchange Trading schemes (LETS) will balance our budgets, and even help us to save it.

Green skills rely on education, and to

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transitsuccessfullyto a green economy it is necessary to provide an opportunity for workersto fulfill this transition.

In 2013 and 2014, the annual review growth underlined the potential for works' creation ofthe ecologically oriented economy and the need to develop the strategic structures, in which the labor market and the professional policy are playing an active role in supporting works' creation.

In addition, as stated in the 7-th Program of actions of the Environment it was revealed that the full growth and the potential of jobs of the ecologically oriented economy depends on improving of the ecological integration and strategic sequence so, that the sector policy in the Union and on thelevel ofthe state member was developed.

In 2014, European Resource Efficiency Platform (EREP) also emphasized the need to develop a broad strategy for landscaping jobs, skills and education, and called for the EU to integrate the goals ofstability, to identify the tools of the labor market, to accompany the transition, to mobilize the EU funding, to support the exchange of useful experience, to contribute to raising awareness and commitments.

According to the provisions of UNESCO, concerning the stable development of society, its main resources are knowledge and the social and moral values of its professional personnel. In this case, higher education has a crucial role in the development of these qualities in the future specialist. Ecological education in nowadays is trying to solvecomprehensively a number of important tasks such as: ecological education, biosphere protection, protection against ecological hazards, prevention of ecological disasters, human survival, formation of ecocentric personality.

Formation of ecological competence of students of high school is a continuous process of gradual inclusion in ecological activities through the acquisition of experience of participation in practical affairs to preserve and improve the environment, ecologically significant personal qualities, such as humanity, empathy, thrift, their own health status, responsibility for the results their ecological activity through the use of active learning techniques that promote the acquisition of a set of knowledge about the natural environment as the most important value, about the nature of

impact and the norms of human interaction with the environment and skills to solve ecological challenges creatively (Dlimbetova and Aliyeva, 2014).

In connection with the transition to the global development of a "green economy" education for stable development becomes its inseparable part. (Dlimbetova and Alieva, 2014).

Consequently, the learning of things that become known in the context of universities as "knowledge in stability" is a task that can not be neglected by universities (Murga-Menoyo, & Novo, 2014).

In the UK parliamentary report it was stated that "the transition to a green economy requires a 'greening' of the whole economy. Also, all jobs have to be "green".

What are the challenges that Kazakhstan isfacing in the transition to a green economy? How can you solve them and what is the role of higher education in this transition?

The Interest to the issue of ecological education organizationexhibit both domestic and foreign researchers. At the present stage, extensive experience in the field of ecological education has been gained, however, global progress in this area is not enough available for the teaching community, as there is a lack of works on the ecological skills in ecological education.

Al FowehiHazaa Abdul Karem, Kamisah Osman, T. SubahanMohdMeerah conducted a study on the effectiveness of the curriculum and extra-curricular plan in the development of ecological skills and values. This study aimed to investigate the effectiveness of the module, based on the actions of the curriculum and extra-curriculum focusing in the development of ecological skills and values among secondary students (Al FowehiHazaa Abdul Karem, Kamisah Osman, &T. SubahanMohdMeerah, 2011). The curriculum in their current situation in Saudi Arabia does not achieve the goal of learning the fundamental concepts, related to the widened concept of the environment or the understanding of the relationship of interaction between man and the environment. The curriculum didn't also develop critical skills of students, as well as problem-solving skills that are highly needed in recognizing and solving ecological problems. This situation is acute in Saudi Arabia as a result of the

promotion of science and technology because of the growth of oil production. But the authors presented the results of an experimental study of determining the effectiveness of the ecological module to improve the ecological values of the Saudi students. In addition, it was determined the effect of gender on the formation of ecological values (Al FowehiHaza Abdul Karem, Kamisah Osman, & T. SubahanMohdMeerah, 2011).

Consequently, the current generation is losing traditions and customs that are underlined in love for the environment and nature and the importance of supporting their balance.

In Kazakhstan, a lot of ecological problems, associated with oil in the Caspian region. And traditional curricula in universities do not give results on the formation of ecological competence.

According to Olga Perfilova and Yulia Alizade's opinion, conditions of high social and cultural dynamics form a new vision of the educational role of the university as a mastering center of a high level of competence (Perfilova, & Alizade, 2011).

Bon-Gang Hwang, Wei Jian Ng studied the competence of project managers, under the conditions of a green building. They tried to identify the difficulties, which were faced by the project managers, who perform green building projects and to identify critical areas of knowledge and skills that are required to comply with such requirements (Bon-Gang Hwang, & Wei Jian Ng, 2013).

Gagarin A.V. believes that ecological competence in the structure of personality is directly related to its major entities such as ecological awareness, ecological culture, ecologically oriented outlook. Based on the correlation of the concepts of "ecological competence", "ecological awareness", "ecological culture", "ecologically oriented outlook", the following functions of ecological competence may be pointed out: ideological, methodological, ecological, value, predictive, social, cultural, professional (Gagarin, 2011).

The aim of our study is to analyze the state of ecological competence of students in the present time and identify the place of green skills in ecological education in Kazakhstan.

In modern times a growing interest in ecological competence. Interest in the identification

of the concept of ecological competence increased in connection with the understanding that the solution of global ecological problems existing in the modern world is impossible without qualitative changes in ecological culture and ecological competence.

From the point of view of the competence-based approach, the future specialist should not only have extensive and deep knowledge and skills in various fields of ecology, economics and other sciences, but have effective knowledge and skills, to want and to be able to apply them in life.

This representation in the formation of competence-based approach in ecological training of future specialists is complicated by a number of contradictions:

Between society's need for ecologically competent professionals capable of effective educational activities and lack efficiency of formation of ecological competence of future specialists.

#### **Methods**

We used the following methods in this paper: the material for the transition to a green economy in Kazakhstan was studied as well as theoretical and methodological analysis of scientific, psychological and pedagogical and courseware on the research topic; analysis of the curriculum, pedagogical experiment using the developed methods; diagnostic: conversation, questioning. The conducted analysis is a good prerequisite for the implementation of the work to improve the ecological training of students.

The assessment of the state of ecological competence of students is carried out by means of a questionnaire. As additional methods observations and interviews were used.

According to the results of theoretical analysis, ecological competence of a person the following evaluation criteria were identified.

High level. Inherent to: the presence of ecological knowledge, the estimating ability to identify humans as part of nature, the desire to receive ecological knowledge, to maintain the position of the positive interaction with nature, to observe and appreciate the ecological laws of nature, have an idea of nature as the supreme value.

Middle Level. Inherent: the presence ecologically oriented ideas about the nature, the ability to identify their characteristics and identify

their place in life, presence of own judgments about man and nature, but personality is influenced by people, readiness to receive ecological knowledge, the lack of its own position in relation to the nature, surface contact with them, readiness to mutually beneficial relationship with the nature.

Low level. Inherent: abstract, short assessments about the nature, the lack of evaluation of the relationship between man and nature, selfish attitude towards the nature, the lack of readiness to receive, seek and process information about the environment, the manifestation of negative behavior in interaction with nature, the lack of willingness and commitment to mutually beneficial cooperation with nature.

One of the important components in teaching ecology is an effective training program (Hus, 2010). The technique of formation of ecological competence included various forms of organization of educational process: lectures, laboratory practice, seminars, field workshops and other types of extracurricular work. Classes are conducted on a modular technology training. The module "Stable living in Kazakhstan" consists of three disciplines: ecology and stable development, the foundations of life safety and mother-tongue education. Disciplines of the module are interconnected within ecological development, security development and cultural development.

The study the module will enable students to acquire general competences in the field of theoretical, applied, communication skills, based on knowledge of the Kazakh language, to show respect for the ecological culture and traditions of the Kazakh people and other ethnic groups, living in Kazakhstan.

Students will be able to report about possible ways of solving problems to apply these messages directly to aspects of life situations, protect themselves properly.

The purpose of learning of module discipline "Current ecological problems of Kazakhstan" is the study of the ecological situation of the Republic of Kazakhstan. Identify the main causes and consequences of ecological problems of the state. Analysis of cross-border ecological problems and their solutions.

However, one of the main forms of organization of educational process was still lecture. Lectures were taught by three kinds. The

first kind is the introductory lecture, when students familiarize with the discipline of ecology and stable development, get more detailed information about the structure of studying the discipline within the module. The second type is the main lecture lectures on the following thematic topics: habitat, autecology, population ecology, community ecology, biosphere, actual ecological problems in Kazakhstan. The third type is a guest lecture, for its conduction well-known ecological scientists of Kazakhstan and scientists from foreign countries are invited.

Laboratory and practical classes with the use of learning technologies in collaboration also included two stages. Also, the students formed such a component of ecological competence as "student activities for the extraction of ecological knowledge" they acquired the ability for collection and analysis of information, obtained during the laboratory work.

An important role in the formation of ecological competence of students took directly "communion with nature". Of great importance in this case was a field trip on the environment. Education in the course of "Field practice in ecology" was carried out with the use of technology work in small groups.

The criterion of formedness of cognitive component of ecological competence is the actual application program modules by students the quality of ecological knowledge, which was determined by the results of a modular job.

At the end of the module study "Stable living in Kazakhstan" students acquire and demonstrate knowledge and understanding, associated with Bachelor's level and show originality in the development of the application of ideas, including in the framework of the research context, and are able to solve problems within the broader (multidisciplinary) contexts, related to their field of study, are able to draw conclusions clearly and consistently. Acquired individual skills allow them to continue their education on their own.

## RESULTS

The main base of empirical researches was Kazakh Humanitarian Law University. The students were asked to answer 12 questions, combined in the following groups:

1. Awareness of their involvement in the solution of ecological problems.
2. The criteria for determining the ecological competence:
3. Self-assessment of their level of competence.

Questioning was carried out among students in the control group, who did not study the discipline "Ecology and stable development" and among the experimental group of students, who are currently studying the discipline "Ecology and stable development". Previously, in the experimental group were enlisted students with high IQ, and in the experimental group students with low IQ. 100 students were interviewed. Age and sex structure of the respondents is as follows: 40% of men 60% of women. At the age of 16-19 years old, 95% and 5% represents the age group of 20-22 years old. Among the respondents, the main group is freshmen. It is at the first course students learn discipline "Ecology and stable development".

Distribution by departments: economics – 12%, law–27%, international law–29%,tourism – 8%, finance–17%, management –2%, psychology – 5%.

The question of how do you get information about ecological issues? Respondents in the control group responded as follows: 20% from the conversations with friends and acquaintances, 15% in the learning process in schools, 1% from the special literature, 12% from the internet, 47% from the television and radio. Students in the experimental group gave the following answers: 53% from the educational process, 23% from television and radio, 7.3% from the publications, 5.8% from the special literature, 8.8% from the conversations with friends.

Consequently, today's students receive basic information about ecological problems in the educational process from television and radio.

Students were asked: "How do you see their involvement in solving the ecological conditions You live under?" The experimental group gave the following answers: relocate–6.9%; possibly to be actively involved in community ecological activities – 68%; leave a solution for the competent authorities–25.5%; international organizations–16.2%. Respondents in the control group responded: relocate-0; possibly to be

actively involved in community ecological activities-56.2%; leave a solution to the competent authorities-22.9%; international organizations-12.5%; difficult to say-8.3%.

Thus the students of the experimental and control groups responded that first of all in solving the ecological situation in the region, where they live they see their participation in social ecological activities.

What do you know about a green economy? Control group: I do not know anything answered 20% of respondents and 80% of the students were able to give their answers about what is a green economy.

Among the experimental group received the following answers: I do not know anything said–25% of respondents, gave their answers–42%, and difficult to answer–13%. Such data in the experimental group received before studying this topic. After studying the topic, we conducted another questioning we obtained the following results: 85% gave their answers and for 15% it was difficult to answer. Thus, students in the experimental group through the study of educational material were able to expand their knowledge in the field of a green economy, due to the fact that initially they did not own any information on a green economy in Kazakhstan.

"How would you rate your level of ecological competence?"

Experimental group: high, responded – 14.5%, rather higher than the low–18%, middle–33%, rather low than high–18.7%, low–6.2%, hard to answer–8.3%.

Students in the control group answered, high –7.6%, rather higher than low–5%, middle–56.4% rather low than high – 30.7%, lowest–0%, difficult to answer 5%.

Students of experimental and control groups believe in most cases they have an average level of ecological competence.

In the control group the number of students who said that the level of ecological competence rather low than high is dominated. Among the experimental group 6.2% of the students pointed the low level of ecological expertise.

What in your opinion is an integral component of ecological competence?

The control group gave the following

answers: knowledge–23.6%, the desire for ecological self-education–18.4% nonprogrmatic relationship to nature–14%, ecological skills–13%. Experimental group: knowledge–33%, the desire for ecological self-education–14.5%, personal experience with nature –20%, ecological skills–10.3%.

Students say that the ecological knowledge primarily determines the ecological competence, in the control group dominated answers about the fact that nonprogrmatic attitude to nature determines the level of ecological competence, and the students in the experimental group isolated personal experience with nature. Ecological skills are in the last place.

So students are aware of their involvement to solving ecological problems, it leads to the conclusion about the necessity of ecological education of students – the future experts in high school.

As a result of empirical studies it has been found that having evaluated your level of ecological competence as high, a real assessment of their ecological competence close to the average. It has been revealed that the level of ecological competence of students varies, depending on their specialty and training and depends on the ecological discipline.

## DISCUSSION

According to the results of theoretical and empirical studies there were identified factors, affecting the efficiency of formation of ecological competence of students: the level of ecological knowledge of students; students' attitude to ecological issues; interests and needs of students in ecological performance; practical experience in the ecological performance of students, etc.

Ecological competence covers a range of specific professions. But for each profession it is necessary to develop individual ecological competences. New and additional skills are necessary to train for each profession (e.g., literacy in carbon emissions), taking into account the industry and professional characteristics (e.g., transportation, construction, etc.) The transition to a green economy corresponds to the key priorities of Kazakhstan. However, it is possible that Kazakhstan will face a shortage of ecological skills

and competencies for green sectors.

The analysis of the references has shown, that despite of the fact that the integration of education, science and industry, the development of education, based on modern science and technology are one of the priorities of a green economy of Kazakhstan, there are several factors counteracting this process. Factors that limit the transition of formation of ecological competence and skills:

- 1) Insufficient number of design institutes and design bureaus delaying the transfer of technology into production. There is no mechanism of interaction of design institutes, design bureaus and production with universities.
- 2) Weak link between education, science, and industry. It is due to the following factors:
  - a) Interdepartmental barriers between universities and scientific organizations;
  - b) Inadequate funding of university science; excessive administration of the educational process, which does not allow flexibility to respond to advances in science and technology, to take into account the changing needs of industry;
  - c) Lack of economic stimuli of the private sector to invest in education, science and innovation activity;
  - d) The ineffectiveness of training programs on ecology (State program for development of education of the Republic of Kazakhstan for 2011-2020 from February 1, 2010).

But the transition to a green economy and innovative development of Kazakhstan in addition to the ecological competence needs new “green” skills. What are green skills? In modern times there is no precise definition. But the transition to a green economy in each country is carried out by an individual way, taking into account the characteristics of the country.

The current state of the economy, education, social development etc. Consequently, the “green” skills are determined, depending on the socio-economic development of the state and labor market needs.

A green economy, green growth and green jobs were subjected to various definitions (Green growth knowledge platform (GGGI, OECD, UNEP, World Bank), 2013). We offer to give

possible following definition of green skills.

“The green skills” –personal qualities, skills, knowledge, abilities and activities, aimed at reducing of energy consumption, protecting ecosystems and biodiversity or minimization of emissions and waste.

The analysis of the references on a green economy shows that green skills are connected with technology and aimed to create green jobs. There is a need to create new knowledge and professions. In this case, the main task is reforming and modernization of the education system. Need to improve primary education, improve skills and retrain specialists in all areas within the training framework throughout life.

Since all jobs can and must become more ecological, it is necessary to develop a wide range of appropriate skills for “green jobs”. In such sectors as renewable energy, transportation, energy-saving technologies, agriculture, water management, energy, waste management etc. (European Training Foundation, 2012)

Green jobs dictate the implementation of new specialties in the field of education. These are new jobs with new skills and ecological competences, “green” skills.

Green jobs – an idea – using industrial policy to promote certain industries, while there were arguments in favor of industrial policy, in which companies and government is involved in strategic coordination to promote economic efficiency (Furchtgott-Roth, 2012).

“Green” jobs contribute to the preservation of the environment, providing the necessary wages, safe working conditions and workers’ rights. “Green” jobs cover a variety of sectors - industry, transport, energy, construction etc. It works to ensure the integrity of ecosystems; energy saving, rational resource management, conservation of water systems, reducing carbon emissions; reducing waste and pollution. (Organization for Economic Cooperation and Development, 2011)

While Kazakhstan just creates and implements ecological skills and extend them. Meanwhile, Europe is actively developing “green” skills and labor markets. Kazakhstan’s competitiveness will depend heavily on the innovative capacity of Europe and the availability of its skilled workers.

Consequently, in order to make the transition to a green economy, conscious citizens and consumers are needed, as well as professional experts, who are able to ensure the stable development of the state, as well as the need for new innovations.

Changes that occur in Kazakhstan dictate the introduction of new competences and skills in the educational process. The fundamental concepts of education and the economy change.

## CONCLUSION

The current ecological situation conditions inclusion in the decision of each ecological problem of the world and the formation of future specialist with ecological competencies is one of the goals of higher education. An important feature of the ecological competence is its application in practice, in a professional or in certain ecological situation (Erdyneeva and Kadashnikova, 2009; Yumasheva, Perfilova, Sokolov, 2012). To be ecologically competent is to act ecologically in any field. The new economy dictates new requirements for workers and working managers. They must constantly improve and adapt to production innovations. A base is needed and the possibility of acquiring new knowledge by workers within the frameworks of perspectives of learning throughout life. Of fundamental importance is a link between the labor market and green skills that higher education can provide for transition to a green economy.

In Kazakhstan institutional forms of support for innovative structures are not developed that perform development and providing bringing the results of research and development activities to their implementation.

It is obvious that there is a situation, when there is a big gap between basic skills, which the system of education are now implementing and green skills that are demanded in the labor market.

The current state characterizes the huge gap between them. Only their close relationship can provide the narrowing of this gap.

### Thus we can conclude that

- 1) Greening the economy is happening all over the world no matter what the level of development of the state is.
- 2) In connection with the transition to a “green

- economy”, significant changes occur in the field of education.
- 3) ESD and a “green economy” are resources, which help people to build a clean environment for life. Their implementation contributes to the development of new skills and competencies for both the employee and the consumer. The decisive factor for achieving a culture of stability is the university training of future professionals (Mercè Junyent \* & Geli de Ciurana, 2008).
  - 4) The transition to a green economy is changing the labor market.
  - 5) The labor market requires new levels of ecological competence, basic skills, and “green skills” for green jobs.
  - 6) Kazakhstan institutional forms of support of innovative structures are not developed that perform development and providing bringing the results of research and development activities to their implementation.
  - 7) While Kazakhstan is actively implementing only basic skills and expands them. Meanwhile, Europe is actively developing “green” skills and the labor markets. It can create economic dependence of Kazakhstan from European countries.
  - 8) Consequently, in the labor market there is a huge lack of skills and competencies and the huge gap between the requirements of the labor market and the education sector.
  - 9) Education for the future should make a concerted effort to regroup this scattered knowledge - from natural sciences to locate the human in the conditions of the world; from the social sciences, to shed light on human multidimensionality and complexity – and to join in this scientific knowledge invaluable contribution of the humanities (Morin, 1999).
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