

REFERENCES

1. Sukharev, O.S. Choice of state priorities in research-engineering development / O.S. Sukharev, S.O. Sukharev // South Russian State Polytechnic Un-ty press. – 2012. – № 6. – PP. 44-76.
2. Bases of the Russian Federation policy in the sphere of science and technology development over the period up to 2010 and further perspective (approved by the President of the Russian Federation V.V. Putin 30.03.2002). [Electronic resource] // Nano news net: official site. – [2009-2015]. – URL: <http://www.nanonewsnet.ru/node/3266> free. – Title from the screen (date of reference: 23.03.20015).
3. Branskiy, V.P. Social synergetics and acmeology / V.P. Branskiy, S.D. Pozharskiy. – Saint Petersburg: Polytechnika, 2001. – 159 p.
4. Al'tshuller, G.S. Creativity as an accurate science / G.S. Al'tshuller. – Moscow: Sovetskoye radio, 1979. – 175 p.
5. Inventions in the USSR in 1919-1989. – Moscow: All-Russain Research Institute of Patent Information press, 1989. – 439 p.
6. Mamardashvili, M.K. Psychological topology of a way / M.K. Mamardashvili. – Saint Petersburg: Russian Christian State University press, 1997. – 572 p.
7. Knapper, C.K. Lifelong learning in higher education / C.K. Knapper, A.J. Cropley. – L.: Kogan Page, 2000. – 233 p.
8. Saprykin, D.L. Engineering education in Russia: history, concept, perspectives // Vysheye Obrazovaniye v Rossii. – 2012. – № 1. – PP.125-137.
9. Subetto, A.I. Intellectualization of education as a problem of the XXI century [Electronic resource] // Academia Trinitarisma: – Moscow, 2002-2015. – URL: <http://www.trinitas.ru/rus/doc/0012/001a/00120061.htm>, free. – Title from the screen (date of reference: 23.03.2015).
10. Likholetov, V.V. Professional education: humanization and creative technologies: monograph / V.V. Likholetov. – Moscow: Moscow State Industrial University press, 2001. – 230 p.
11. Likholetov, V.V. Development of creative imagination: manual / V.V. Likholetov. – Chelyabinsk: South Ural State University press, 2008. – 165 p.
12. Contemporary conditions of TRIZ-education: analysis and perspectives of development / G.V. Terekhova, A.A. Nesterenko. – Saarbruecken: LAP, 2012. – 200 p.
13. Timoshenko, S.P. Engineering education in Russia / S.P. Timoshenko. – Lyubertsy: VINITI, 1996. – 82 p.
14. Tenchurina, Kh.Sh. Establishment and development of professional pedagogical education (the last third of 19-th – beginning of the 1990's): abstract of dissertation / Tenchurina Khalidya Shakerovna. – Yekaterinburg, 2002. – 42 p.
15. Mukhin, Yu. Masters of folk idiotism [Electronic resource] // Mukhin Yuriy Ignatievich: official site. – [2009–2015]. – URL: <http://www.ymuhin.ru/node/324>, free. – Title from the screen (date of reference: 23.03.20015).
16. Likholetov, V.V. Mutually enriched transfer of theoretical technological achievements in natural science, engineering, and musical-artistic spheres // Innovatsii v sovremenom muzykal'no-khudozhestvennom obrazovanii. – Yekaterinburg: РГППУ, 2007. – PP.50-58.
17. Akhtyamov, M.K. TRIZ as a basis for knowledge transfer in business economy / M.K. Akhtyamov, V.V. Likholetov // Russian Journal of Entrepreneurship. 2009. – № 2. – PP. 59-63.
18. Betelin, V. We are engineers // Expert. – 2008. – № 46. – PP. 60-68.

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Environmental Training and Education

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Article highlights issues of environmental training in secondary and higher education. Authors suggest universal formula of progressive education, which is targeted at unity and progressive development of Russia by means of environmental training. Current article is of conceptual kind and comprises different areas of environment.

Key words: environmental education, environmental training in secondary and higher education, universal formula of progressive education and training.

In the modern world, education becomes an important process in development of social and economic progress. During ecological crisis the educational system is the source capable of forming human qualities such as love, kindness, respect, mercy, compassion for others and Nature. Such moral qualities of a person are needed to understand value of life, responsibility for life preservation and great «reverence» for life.

Absence of such set of values prevents from application of modern clean technologies and environmental friendliness. What is needed is the review of all main types of relations: relations between man and nature, relationship between man and man. The process of training in the educational system acquires new tasks.

Education is inextricably, harmoniously connected with training that is to say that education and training are united. Therefore, universal formula of progressive education and training is as follows:

Progressive education and training form united harmoniously tightened process of formation of creative individuals with high level of knowledge, intelligence, patriotism and sports.

Therefore it is necessary to significantly accelerate the process of patriotic education in Russia; suppress any distortion of history;

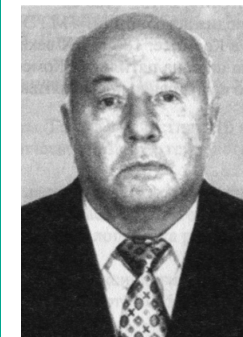
imply criminal responsibility for promotion of fascism and nationalism.

One of the main areas of patriotic training is the environmental training: love for the motherland, for our Nature, goodwill, mutual assistance, formation of ecological intelligence and many other positive qualities. All of them eventually should be targeted towards the ultimate goal – to strengthen unity and progressive development of Russia.

In Russia in 2009 Danilyuk A.Ya., Kondakov A.M. and Tishkov V.A. issued “Concept of spiritual and moral development and training of individuality of a Russian citizen”. This particular concept formulates core value milestones, moral norms, ethical standards, which can unite youth into a single historical, cultural and social community during tough times of the country development.

However, training of modern youth in the Russian educational system is almost untouched [2].

At schools, gymnasiums and lyceums training mostly stands for observing discipline. In educational institutions results of monitoring, ratings are considered as important parameter; families appreciate the results and achievements expressed in high grades. Main affords of teachers and parents are targeted towards successful results of Uniform state exam which is a



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step to successful start in career.

Besides, according to the research of Yasvin V.A. only 15% of biology teachers consider environmental training as their main pedagogical task, when 66% are convinced that they have to stick to formation of biological knowledge. [9].

The situation in institutes and universities is similar. Higher school requires rapid acquisition of knowledge from young people and ability to apply them successfully in professional activities. Ethical education of students is almost not paid attention to [7].

According to Baidenko V.I. higher education should put stronger emphasis on strengthening ethical and moral aspects. The new approach is needed, the one which will shape "human" personality, lead to creative actions and responsibility for decisions made, raise spiritual and moral personality. Modern graduate of a higher educational institution or a student should not only be able to adapt quickly to new working conditions, but should have strong moral position [1].

However, in day to day life we observe how modern man constantly puts himself in fierce competition chasing for profit. The priority of profit, consumer attitude to each other is not just a feature of a modern student but a feature of an adult.

Thus, we can conclude that systems of secondary and higher education systems are focused on high ratings, when no one pays attention on formation of highly spiritual personality, making it responsibility of a family. The ethical component of decisions made is not of the interest of majority.

Analysis of scientific sources (Novikova A.M., Stepanova P.V., Zimnyaya I.A., Yasvina V.A.) has reviled a number of complex and controversial issues in the aspect of training. According to Zimnyaya I.A. there is no training strategy in lifelong learning in Russia. It is currently under development. [3, p. 70-79]. Training aspect was studied by Babochkin P.I., Bondarevskaya E.V., Korotov V.M., Lisovskii V.T., Likhavch B.T., Novikova

I.I., Rozhkov M.I., Selivanova N.L., Talanchyuk N.M. and others [3,6].

We believe that ecology, which holds one of the most important positions in current educational system, can be the solution as it contains strong educational function. Teaching ecology aims to increase the level of moral rights, to create new world-view, form critical and reflective thinking in respect of life and any person and the World based on the principle of «Reverence for life» of A. Schweitzer and the «Earth ethic» of A. Leopold.

According to Totai A.V. the aim of the environmental training is in formation of responsible attitude towards environment, which is based on ecological conscienceness. It implies observance of moral and legal principles of management of natural resources and active actions focused on education and preservation of the local nature [8, p. 329].

Teach students to see the beauty of Mother Nature, cherish and love it are the main tasks of any teacher. These are love and respect for the native land, small motherland which have been always a powerful resource, a reserve for development, for formation of spirituality and morality of a man. For many great writers, poets, composers, artists, scientists it is typical to show reverent attitude and praise the beauty of nature. It contributed to their spiritual formation and inspired them for many great works.

Thus, environmental education which lays the foundation of humane attitude towards nature has paramount importance in formation of highly moral attitude towards nature for the person [5]. In this particular aspect leading role is given to the natural science, as it has actual links with the study of nature, living organisms and man.

Department environmental geology was opened in the Ural State Mining University in 2010. It has the new for the region educational program "Management of the environment and natural resources". One of the top priorities of the department

is formation of moral principles and improvement of environmental culture of students. Manual "Environmental geology" and courseware "Study of biosphere", "Soils", "Social ecology" were published at the department. They all have elements of eco-axiological approach and based on original studies of eco-philosophers Vernadskii V.I., Schweitzer A.L., Chizhevskii A.L., Reimers N.F.

In line with the development of eco-axiological world-view of the youth field training "Biodiversity and general ecology with the elements of soil science" is held on the Nature Park "Bazhovskie mesta" in order to form respect for the nature of the Motherland. It includes studying of soils, flora, fauna, surface and underground hydrosphere.

Nature Park "Bazhovskie mesta" is the natural area of preferential protection of the regional level. According to the regulations, natural parks are environmental, ecological and educational and research institutions, their territory (water area) includes natural complexes and objects having special ecological, historical and aesthetic value, and they are intended for use in environmental, educational, scientific and cultural purposes.

Within the field training in order to study the environmental characteristics of the Nature Park students conducted research on biodiversity. Students became familiar with various methods of catching small mammals and insects (mowing method, trapping grooves), the collection of non-flying insects. During laboratory works students determined species and systematic affiliation as well as demographic characteristics of mammals, rodents, amphibians and made collections of insects. During each class you could observe how enthusiastic and inspired were both students and teachers learning something new about the nature and wildlife. But the most important and valuable observation about the students is the emergence of desire to know the nature of the native land.

In the suburbs of the Nature Park "Bazhovskie mesta" students have found population of gray heron. Students defined basic characteristics of the species, ecology, food and social activity. After long observation of birds they formulated a scope of measures needed for the preservation of the population: reduction of the penetration of urbanization, prohibition of logging in order to preserve habitats, promotion of the necessity to protect the species.

Further students proceeded with the study of the Talc Stone Lake. Students learned the history of the lake, notified its beauty, uniqueness of "Bazhovskie mesta". They studied characteristics of meadow, forest, floodplain and anthropogenic types of plants. Students learned how to collect medicinal herbs and properly make herbarium.

Large populations of rare species of plants were found in that area. Students studied, counted, measured and characterized rare species listed in the Red Book of the Sverdlovsk region [4]. Current activity helped to form individual responsibility of each student for preservation of each species.

With the understanding of the importance of research and educational practice students were more responsible in studying of nature (flora, fauna, chemical composition of soil types, surface and groundwater). Participants set the effect of anthropogenic load on the condition of natural complexes and studied reduction potential of wildlife.

Based on results of the research backed by the theoretical studies of Vernadskii V.I., Schweitzer A. et al. students could once again assure themselves in the complexity of interactions of all components of ecological systems in the Nature Park "Bazhovskie mesta", they perceived nature as integrated system with interdependency of all components.

In parallel with the study of methods, there were conditions favorable for formation of human features such as ethics, responsibility, caring and sensitive attitude

to nature and others, to any living creature. On the basis of the real facts students faced the revaluation of the abilities of nature and the place of a man. Moral interpretation of inextricable links with nature made all the participants feel responsibility for its preservation.

Educational field training in Nature Park "Bazhovskie mesta" has great potential and opportunities for educating a man cherishing nature of the native land.

Findings lead to understanding of the interdependence of man and all inhabitants of ecosystem. Man is a part of the complex system – the Nature. Such environmentally friendly world-view makes young people more responsible towards nature and any form of life.

Following these principles the course is

based on the concept that man and nature are interrelated elements of the Earth. Man acts primarily as a spiritual and moral being who is responsible for all further activities, attitude towards other people, animals and plants of his native land.

Prospects of further actions should be targeted at:

1. Expending quality and quantity of environmental studies.
2. Enhancing environmental training in educational systems.
3. Creating environmental brigades at the universities and schools with the view to the acting construction brigades. Particular attention should be paid to stimulation of environmental intelligence.
4. Forming a man with the "reverence" for life.

REFERENCES

1. Baidenko, V.I. Identification of set of competencies of graduates as necessary stage of designing a new generation SES of HPE: method book / Baidenko V.I. – Moscow: Research center of specialist preparation issues, 2006. – P. 72.
2. Daniyuk A.Ya. Concept of spiritual and moral development and training of individuality of a Russian citizen / Daniyuk A.Ya., Kondakov A.M., Tishkov V.A. – Moscow: Prosvyashenie, 2009. – P. 28.
3. Zimnyaya I.A. Strategy of training: opportunities and reality// Knowledge. Understanding. Abilities – 2006. – № 1. – P. 67-74.
4. Red Book of the Sverdlovsk region: animals, plants, fungi / chef-editor Koritin N.S. – Yekaterinburg: Basco, 2008. – P. 256.
5. Losev A.V. Social ecology: course book for universities / Losev A.V., Provadkin G.G.; edited by Zhukova V.I. – Moscow: VLADOS, 1998. – P. 312.
6. Stepanov P.V. Diagnostics, analysis and planning of the school training process/ Stepanov P.V., Stepanova I.V. – Moscow: Pedagogical search, 2007. – P. 67.
7. Shterenberg M.I. Crisis and issues of education// Issues of philosophy – 2010. – № 4. – P. 158-167.
8. Totai A.V. Ecology: course book / Totai A.V. at all; edited by Totai A.V. – Moscow: Uright, 2012. – P. 407.
9. Yasvin V.A. Psychology of attitude towards nature/ Yasvin V.A. – Moscow: Smisl, 2000. – 456 p.

Learning Factories: The Way to Create World Class Graduates Through Engineering Education

The Private High School of Engineering and Technologies Tunis, Tunisia
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The learning factory can be defined as a type of university – factory (or professional institution or company) that aims to produce better generations of students and make them more ready to market. This paper describes a model of learning factory made at Esprit School of Engineering, Tunis, Tunisia. This paper shows also the specifications of this experience as it is held at in an institution already facing major changes in its curriculum due to following active learning educational approach.

Key words: active learning, learning factory, educational programs modernization, education engineering, software engineering.

I. THE IDEA

Esprit School of Engineering follows the PBL approach: Project/Problem Based Learning in its courses for its different fields. The main aim of this adopting this student-centered education approach is to guarantee a better results of employability shaping a ready-to-market engineer profiles. The idea came to follow the Learning Factory model at several universities in the world to be the next step after the basic three years of Project Based Learning: Esprit learning factory saw the light in late 2014 to be a space where the student lives the transition from his university to the professional world. Esprit learning factory is acknowledged after analyzing the trending and similar experiences aiming to provide the best transitional environment for the graduate students with the supervision of IT companies and partners.

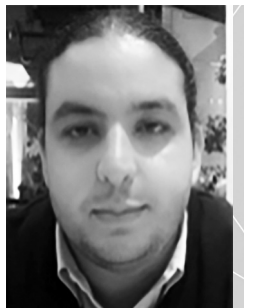
This paper will mainly present this educational experience as a new experience for the educational and professional field in Tunisia. It specifies this experience and the main basis with a first analysis of the industry and faculty needs and expectations.

II. THE CONTEXT

As the main objectives of a learning factory at Esprit are essentially about

shaping ready-to-market engineer profiles in relation with the main project about adopting the active learning pedagogic approach, the need of understanding the context of such an experience remains vital to determine the way of establishing a learning factory. It is essential to know about the needs from the viewpoint of the industry and of the faculty.

- The industry seeks to raise its profits by accelerating the integration of newly hired engineers. The industry seeks for the engineer who applies the fundamentals and integrates the industry to be a productive. In addition, the specific case of IT, implies to be adapted to the new markets and technologies as soon as it appears.
- □ The Faculty, in the other hand, in interested in the measurement of its quality of students, professors and its curriculum simultaneously to shape the perfect profile for national and international accreditation, and therefore distinction. Adopting an active learning pedagogic approach aims to make the faculty more and more active following a student-centered approach implying an active educative environment (updated



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