

The Safety of Our Cities in the Future - the Subject of Education Today

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Abstract. The content of educational and professional standards in "Construction" and "Urban planning" is analyzed. The retrospective of educational reforms in civil engineering and urban planning at high educational institutes of Russia on multilayer basis is given. The scheme of modern educational model realisation in field of civil engineers and urban planners teaching is suggested in the article. This model takes to count requirement of professional and educational standards and harmonizes competencies set and labor functions of construction branch specialists. The analysis and assessment of realising model efficiency on the basis of general paradigm and principles of city transformation to biosphere-compatible environment, that develops a person, is given. It is shown that purposes of civil engineers and urban planners teaching at professional and educational standards are not always unified by the general idea of territory development program creating, that would counts technical, social, environmental and economic factors. It is emphasized that modern educational and professional standards don't reflect the paradigm of biosphere-compatible technology creating. The insufficient level of professional teaching of civil engineers and urban planners is the main reason of many education and construction branch problems. One of the direction to increase specialists teaching efficiency is observed in integration of scientific, educational and innovational potentials of educational and scientific institutes.

1. Introduction

«Education is what remains when all memorize is forgotten» D. A. Granin

The recent history of the transformation of educational standards of higher professional education of Russia shows, that in these standards in almost all areas of training contains the environmental component and there is a kind of concept system approach. At the same time in real life, a complex system of socio - bio - technosphere, the human environment is constantly changing, and in modern conditions of new global security challenges are becoming more prominent in the information environment of society, when the erroneous behavior and environmental degradation of the picture of life people get used, and his subconscious at the level of conscience has long been sounding the alarm [1-5,9-11]. In studies performed in the last decades in the Russian Academy of architecture and



construction Sciences (RAASN) a team of scientists under the leadership of academician V. I. Il'ichev shown that all the problems of the modern city are between the two extremes of the separation of nature and degradation of human development level. Therefore, the most important task of ensuring environmental security and global security as a whole is possible through the achievement of biosphere compatibility of man and nature. The principle of the symbiosis of city and nature becomes uncontested for human survival, and the principles of transformation of the city into biosphere compatible and developing the person [1,7] are a priority to increase the educational level of human potential as indicators of the intellectual community. The need to solve this problem requires adequate changes in human consciousness that brings to the fore problems of ecological education, upbringing and enlightenment.

In Russia vocational education are educational standards of higher professional education of the so-called Phosy transformation which in the last two decades is of a permanent character. A famous proverb says: want to know something, to pay to its origins, the first principle - where it comes from [12].

Over the last two decades in the field of environmental education hastily changed the approaches and principles of the outer shell educational standards. From fundamental education, these principles drifted from "know how to know" or the so-called competent approach to the spread of the reality in many areas of Russian life that in the educational sphere destroys the education and fundamental scientific schools of Russian engineering education. Knowledge is not a substitute for competence, and competence is knowledge [13]. The declaring principles of the Bologna process - a single educational space and free movement of trainees in the landscape of the country's educational space or even abroad, in fact became impossible in principle for the overwhelming number of trainees. Curriculum for each institution is allowed to develop independently. To ensure the same competencies, textbooks have become different, the methodology for transferring knowledge and the content of this knowledge has been built on a different conceptual, methodological and content basis. And the test and rating forms of knowledge control used in some universities finally destroyed the basis for fundamental training of specialists, including environmental specialists in the architectural, construction and urban development spheres.

If we take as a basis the main thesis voiced at the fifth international scientific congress "Globalistics-2017": global ecology and sustainable development [14] that "ensuring global security is the achievement of biosphere compatibility of man and nature", then environmental education is the basis for solving this problems should also be built on the principles of biosphere compatibility. From these positions, we turn to the educational standards of higher education in the architectural and construction field and, using the principles of biosphere-compatible technologies, we will analyze the requirements of standards in the field of environmental safety. Let's start with the terminology used in the GSSN. The overwhelming number of teachers and sensible people do not support the idea that education is a service. The term "educational service" used in educational standards destroys the very concept of education, i.e. an effective millennial practice of transferring buildings from teacher to student: the student becomes a purchaser of the service, and the educator is the seller of this very specific service. It is difficult to imagine that such a form of education in the form of a service provides a good level of knowledge. It is possible to cite other terms used by the compilers of standards that do not mean anything in relation to education.

The state standard (GEF) is today the main instrument of impact on trainees and trainees (Figure 1). The gradual reform, and in fact the shift of engineering education from the fundamental to the so-called liberal education with the competency approach to the evaluation of education does not contribute to its improvement, but leads to a colonial level [3-4]. Refusal from the principles of fundamental engineering education deprives future specialists of the main thing - engineering creativity and non-standard thinking. It always favorably distinguished the Soviet, and then the Russian engineering schools from all other engineering schools. The great Leonardo da Vinci wrote: "No human investigation can be called a true science unless it has passed through mathematical evidence. And if you say that the sciences that begin and end in thought have truth, then this can not

be agreed with you, but it should be rejected for many reasons, and primarily because in such purely mental reasonings experience does not participate, without which there is no certainty. " The newest educational standards (GEF 3 ++) for the training of engineers allows the use of virtual laboratories.

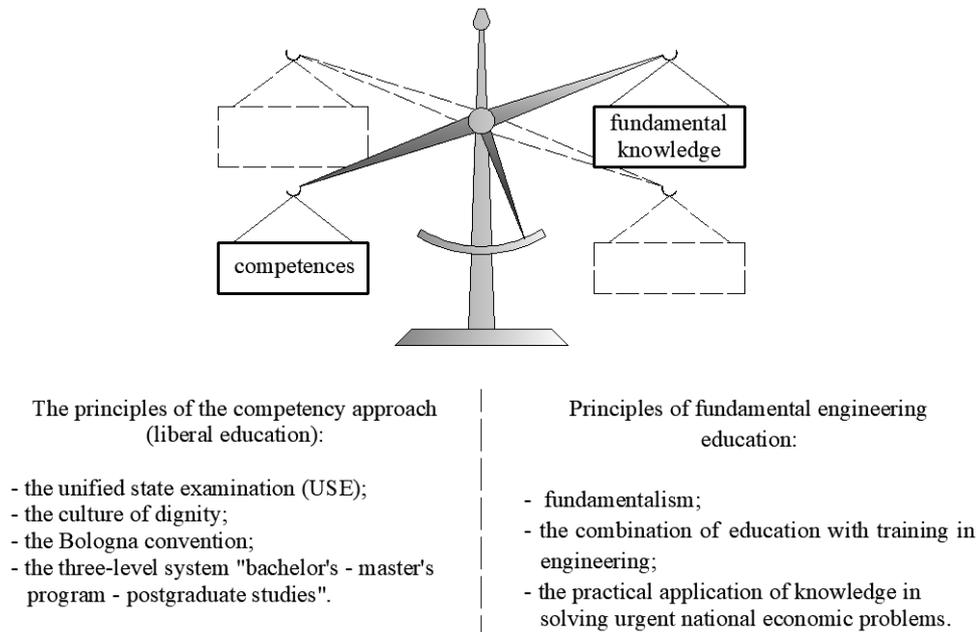


Figure 1. The scheme for reforming engineering education from the fundamental to the "competence"

The first principle, the unity of man and nature, constitutes the foundation of the biosphere - compatible safe and developing man of the city. The main vector of this principle is directed towards harmony of man and nature so brilliantly was demonstrated in the XIVth century on the fresco of the Italian artist Ambrogio Lorenzetti (Figure 2) and almost not reflected in the standards of education of the 21st century that the city and the surrounding nature is one-piece, stable and constantly changing system. In the city life is in full swing - construction is under way, shopkeepers are trading, in the fields are herds grazing and grapes are growing. At the entrance to the city gate an allegorical security figure: she is young, beautiful, but in her hand holds a small gallows with a hanged criminal - a warning to all those who can come to a thriving city with bad intentions.



Figure 2. Ambrogio Lorenzetti. Fruits of good governance. Copy of the fresco

This main target vector of environmental education is not present in modern educational standards. On the basis of this fundamental principle, strategic system planning for environmental education should be carried out-training in the fundamental principles of town-planning, developed in time and space, the mechanism for the functioning of a self-developing city, with an emphasis on the formation of a biosphere-compatible safe living environment in it. The second principle of biosphere-compatible technologies is based on the duality of the problem of "man and the biosphere". In environmental education, it is necessary to speak clearly about scientifically grounded directions for resolving the collision of degradation and gradational principles. On the one hand, it is the seizure of natural resources and the throwing of human waste into it. On the other hand, the negative impact of these wastes on nature and man as part of this nature. The resolution of the conflict can be made possible through training in the creation of new technologies for the city's livelihoods that reduce negative impacts on nature and contribute to the restoration of the biosphere's potential [17,8,10,15]. Almost the same content in all areas of higher professional education VPE environmental education, provided by the competence of educational standards, it is not possible to provide the level of environmental competence of a lawyer, economist or urban planner. The result of such "professional" knowledge is the ever-increasing consumption of natural resources and the ever increasing throw in the nature of human waste. The implementation of the third principle - the quantitative socio-natural-technical system that establishes harmonious proportions between the population and various parts of the biotechnosphere, including the availability and the list of seized resources in space and time, with their binding to the territory of a city or region is hardly possible with a reduction in the overall level of vocational training graduates of universities, their ability to set and solve complex system problems [11,13,17]. The attempts made in recent years in Russian engineering education to turn advanced engineers of a wide profile into good engineers did not lead the country to market ups. It is unlikely that technologies do not add knowledge, knowledge technologies embody. The dramatism of the current situation with engineering education is that the lifetime of the "competence" that the modern university is striving for has become shorter than the term of study at the university [13]. Technical calculations in practice are constantly changing, and their fundamental technical basis is preserved. The basic engineering ideas of the author of the Ostankino tower NV Nikitin for 50 years after its construction are not only obsolete, but also acquired a new meaning, for example, from the standpoint of the unique survivability of this structure, and the technology of designing and erecting this type of objects has changed many times. Principle 4 defines the legislative and normative consolidation of harmonious proportions of the humanitarian balance between different parts of the biotechnosphere. Its practical implementation is the quality of normative documents, it is possible only on the basis of the revival in the new standards of the extremely important principles of the triad of the Russian and then the Soviet system of engineering education: the fundamentality of education-the combination of education and engineering education-the practical application of knowledge in solving urgent national economic tasks. Principle 5- "Knowledge - as a prerequisite for programs for the development of the biosphere compatibility of the city provides for the existence of a high scientific and technical level of basic education that determines the quality of the intellectual and creative potential of the carriers of this education. This is a prerequisite for ensuring the development and implementation of programs for improving the living environment of the city, region and countries as a whole. The new development institutions should be based on professionalism, intelligence, reliable information, and innovation aimed at eliminating negative factors. For scientific and technical development it is not enough to copy and supplement the engineering competence of economic and legal. This is possible where lawyers and economists act as assistant talents rather than the evaluators and administrators of it. The creation of a harmonious social climate is a principle 6, or progress in the educational sphere on the basis of previous principles is possible only on the basis of the revival of the domestic engineering schools. Holding the managers from the formation of pompous events for innovation and, especially, the provision of educational "services", the task of quality education can not be solved. Scientific schools existed and can exist only in the constant creative dialogue between the teacher and the student. While from universities, under various pretexts, for example, the pretext of rejuvenation staff,

these most experienced teachers, trained in the Soviet era, who are carriers of highly professional knowledge, are gradually leaving.

No set of competences can replace the fundamental knowledge, without which there can be no engineer with a high engineering culture and culture in the broad sense of the word, which is the basis of all human life activity. The analysis of the Russian educational standards of the new generation in the field of town planning shows that they, as well as the previously applied standards, are not united by the common goal of preparing the fundamentals of biosphere-compatible technologies, because they are also based on a competence approach, these standards catch up rather than outstrip professional standards, and the applied knowledge received by graduates will, as already noted, grow old before the term of graduation by the graduate of the university. Educational standards [17,18] "remove the tracing paper" from the diseases of the modern city [13]. The competences formulated for them on environmental safety for different areas of training differ little in content. But can there be in principle the same competencies in the field of ecology from a lawyer, economist and urban planner? One should have a general idea of the problem and tasks of environmental safety, the other must have fundamental knowledge and be able to respond quickly to the constantly improving technologies for ensuring this security. The situation is further aggravated by the fact that the graduates of different universities required by the standards of competence are provided with the teaching of completely different professional disciplines defined by each institution independently for the sets of disparate specialists that they have. The lack of systematic and continuity of generations seriously hurts the training of engineering personnel.

One of the ways to improve the quality of architectural and construction education in the framework of the paradigm of the biosphere - compatibility of the city of the developing person is seen in the revival of scientific schools, the integration of the scientific, educational and innovative potential of universities, academic structures and modern high-tech industries. Other modern fashionable "services" such as the newest technologies of Internet education, a set of competencies, a ballroom-rating system for assessing knowledge and pompous managers' activities "for innovation," the task can not be solved. I would like to hope that this understanding will sooner or later come to all participants of the educational process.

Reference

- [1] Il'ichev VA, Emelyanov SG, Kolchunov VI, Karimov AM, Gordon VA, Bakaeva NV 2014 The concept of biosphere compatibility as the basis for the doctrine of town planning and resettlement *Strategic priorities* vol. 1 pp.71-84.
- [2] Tethior, A.N. 2013 Urboecological Concept of Russia in Conditions of Crisis Development of the World *Housing construction* vol. 1 pp. 13-16.
- [3] Sadovnichy VA 2012 *Scenario and the prospect of Russia's development*. M.Uzd-in the URSS p. 320.
- [4] Malinetsky GG: *Do not lose the future - save Russia!* [Electronic resource] <http://ss69100.livejournal.com/2751329.html>
- [5] Meadows D.H. M42 *Limits of growth: 30 years later 2 nd ed.* (e.). Electron. text dan. (1 pdf file: 361 seconds)
- [6] Azarov V.N. 2010 *Ecology of the city* M.Volgograd: PrintTherra-Design p.816.
- [7] Ilyichev, V.A. 2011 *Biosphere compatibility: technologies for introducing innovations. Cities that develop a person* M. The book house "LIBROKOM" p. 240.
- [8] Ilyichev, V.A. 2010 Technique of forecasting the indicators of biosphere compatibility of urbanized territories *Urban Development* vol. 1 pp. 37-43.
- [9] Travush V. 2016 Mechanical Safety and Survivability of Buildings and Building Structures under Different Loading Types and Impacts *Procedia Engineering* vol. (164) pp. 416-424.
- [10] Rifkin J. 2008 *The Third Industrial Revolution How Lateral Power Is Transforming Energy the Economy and the World*. USA. Publisher: Palgrave Macmillan p.407.

- [11] Pryadko IP, Ivanova Z.I. 2017 Biosphere and social processes in the aspect of formation of the urban environment design *Industrial and civil construction* vol. 10 pp.12-17.
- [12] Enin A.E. 2012 The concept of experiment in architecture as an activity aimed at harmonizing the interrelation and mutual influence of the population and the environment of its life activity *Grado-construction* vol. 4 (20) pp. 22-29.
- [13] Ilyichev, V.A. 2014 *Principles of transforming a city into a biosphere-compatible and developing person: a scientific monograph* Kursk: FGBOU HPE "South-Western State University" p. 184.
- [14] Resolution of the Fifth International Scientific Congress "Globalistics-2017: Global Ecology and Sustainable Development" <http://fgp.msu.ru/kongress-globalistika/>
- [15] Ilyichev, V.A. 2016 On the concept and standards of reforming modern architectural and construction education *Strategic priorities* vol. 1 pp. 44-56.
- [16] Transformation of our world. *Agenda for sustainable development for the period until 2030*. URL: [https // sustaiablevelopment.un.org / post 2015](https://sustainabledevelopment.un.org/post2015)
- [17] Federal state educational standards for higher education (GEF VO) of the new generation [Electronic resource]: <http://www.edu.ru/abitur/act.82/index.php>
- [18] Register of professional standards (from 01.08.2016) [Electronic resource] <http://profstandart.rosmintrud.ru/obshchiy-informatsionnyy-blok/natsionalnyy-reestr-professionalnykh-standartov/reestr-professionalnykh-standartov>