

Advanced Development of Engineering Education in Russia

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The article deals with modern conditions of the education in Russia including engineering education and its development perspectives. The design of the best in the World Russian education completely free at all levels with restoration of a Teacher's status has been suggested for improving the unity and advanced development of Russia. The finite purpose is to increase the living quality of Russian people by modernization of the country.

Key words: problems of training, staff training, systems training, skills, higher educational institution, engineer.



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Development of engineering education is one of the main bases of modernization in our country focused on unity and progressive development of Russia.

In due course the President of Russia D.A. Medvedev called modernization «an issue of survival of our country in the modern World». He pointed out: *“We need to modernize our production, our industry, we should introduce new technology, use new materials, involve specialists, teach our engineers better, search for foreign specialists who would assist in modernization”*. (Newspaper «Izvestia», 2010, №169, p.3 of 13, September)

The necessity of modernization in our country is conditioned by many objective causes: run-out of Soviet economy reconstruction, necessity of renewal and creation of new efficient economy for advanced development of the country, transition to the civilized way of development without criminality, corruption, based on single Laws for every citizen, further development

of democratization, formation of leading World country from Russia etc. In general the finite goal of the country's modernization is to increase in life quality of every Russian [1-3].

By modernization of the country Russians mean different points: equality of all before law (41%), tough corruption fighting (38%), social justice (31%), efficient innovative economy (24%), force and mighty of the country (21%), revival of the Russian traditions (14%), new opportunities for commercial activity and competition (12%) and democracy enhancement (7%). In general, they are all right since modernization involves renewal of all spheres of society. Therefore, the country's modernization is vital.

Modernization is characterized by the level of education and technological level.

According to the level of education before 1991, in terms of UNO data, Soviet education made the top three educations in the world, but after adoption of English-American two-level

education system with USE our country took the 66-th place in the world in 2011 – dropped approximately 30 times and continues to decrease.

In terms of engineering level according to the data of UNO, our country took the 62-nd place in the world in 2011 (between Costa-Rica and Pakistan) [1].

In the given period progressive development of our country is performed in two types of modernization: following and advanced [4]¹, properties of which are the following:

1. Following modernization – using contemporary foreign technologies characterized by yesterday level of development passed off as “new”.

- liquidation of great Soviet education, completely free at all levels and introduction instead of it expensive English-American system of education with its USE crossword solution system and degrees: Master, Bachelor, and Specialist;
- application of international standards for the following economy;
- low development of domestic technologies with «enhanced» standard indicators;
- introduction of market-kickback economy with money paradigm (money at all costs, getting money from everything);
- absence of progressive tax system focused on the efficient development of our country;
- outpouring of money into foreign «saving fund» and offshore that will never return to Russia but remain abroad through the bank bankruptcy;
- insufficient development level of engineering education and reluctance of engineers to be hired by employers who need neither

education nor science, but only money.

As a result they consider that one need not develop new technologies, but it is cheaper to buy them abroad with kickback. Such a following modernization presents only temporary «patches» on the engineering development of our country. Therefore, Russia needs the advanced modernization.

2. Advanced modernization means creation of newest high technologies advancing the contemporary level of country’s development and directed at integrity and progressive development of Russia:

- creation of the world best education in Russia based on the domestic and foreign experience, fully free at all levels;
- rebirth of the distinguished title of a Russian engineer – a base for advanced modernization, combining efficiently engineering and humanitarian disciplines with awareness and intellect higher than foreign masters, bachelors and engineers;
- development of Russian standards, indicators of which exceed the international standards necessary for advanced modernization;
- introduction of efficient plan-market economy with progressive tax system and replacement of money paradigm into intelligent paradigm – all for unity and progressive development of Russia;
- investment of finance not aboard, but only to the Central Bank of Russia for progressive development of the country.

As a result it is necessary to create a harmonic unity of education-science-engineering:

- strengthening of unity of the Russian Science Academy subordinate directly only to the

¹ Note: The word «industrialization» in the article [5] is likely to be replaced by the word “modernization” in the given work, as it suggests renewal of the whole country in its progressive development. To modernize means to make modern, change in terms of contemporary requirements absolutely everything: technologies, equipment, agriculture, life-style, thinking etc.

President of the country and not accessible for different official clerks who are very far from education and science with money paradigm;

- restoration of branch science involved in introduction of academic science and performing the advanced modernization at the patent level;
- moral and finance stimulation of development and introduction of latest technologies with high degree of customer's use.

It is just advanced modernization of the country that would provide its strength and progressive development.

As a result one needs to assist the President of Russia in increasing the life quality of Russians, but not opposing and consolidating stupidly wasting time and nerves absolutely uselessly.

Modernization begins with education including increase in the level of engineering education that means increase in the level of knowledge and intelligence [3]. Therefore, it means formation of harmonic combination of engineering and humanitarian knowledge at all levels of education.

Engineering education in Russia is more than 300 year old. At first Peter I established "The School of Mathematical and Navigation Sciences" supported by the state and focused on development of engineering education. Then in 1773 Ekaterina II founded the first in Russia higher engineering university in Saint-Petersburg (Mining Institute). Hereafter two universities were opened: Moscow State Technological University named after N.E. Bauman, the leading one in the Russian education and Tomsk Technological Institute – the first in the Asian part of Russia engineering institution, now National Research Tomsk Polytechnic University which is 110 year old now [5]. Engineering education in Russia was successfully developing especially in the Soviet period contributing greatly to the economy of our country.

Let us recall the history of our country. Thus, in 1917-18 when there was complete ruin in the country, the private property was appropriated in the economy, there was lack of food and clothes, and there was high illiteracy in the country, V.I. Lenin despite his numerous disadvantages, put forward two great decisive ideas:

1. "Learn, learn, and again learn".

That is it is necessary to start the progressive development of Russia with increase in education level – a sum of knowledge and intelligence. Education for everybody was introduced, schools, institutes, universities were built. Everyone understood that if the education of people was not extending, no progressive development of the country could be achieved.

Let us imagine that instead of V.I. Lenin some modern magnate would have come to power (people call them pushers, in old style – representatives of bourgeoisie) and have said to give up learning, and just earn money in any way. It is difficult to imagine what colony our country would have become.

2. The main force that had to develop industry and agriculture progressively was energy industry, namely, electromagnetic energy. Therefore, the plan GOELRO was adopted – a base of Russian development. Actually, only electrification of the entire country made Russia one of the leading countries in the world.

These two fundamental ideas – extension of education and development of energy industry were primary, urgent, and essential even in our time for successful progressive development of Russia. However, they are in sharp contradiction with the American concept of Russia's existence.

The developed «National Doctrine of Engineering Education of Russia» is certain to be the most important positive step on its way of progressive development, but it is characterized by the lack of juridical bases.

Hence, new "Law of Russian Education" is crucial nowadays that reflects

a sufficient increase in the level of engineering education in our country [6].

“Law of Russian Education” is expected to include the following statements.

1. It is necessary to rebirth the social status and prestige of Teachers, and the word Teacher should be written with capital letter with all that it implies. For this purpose, for example, one must increase sharply 2-5 times Teachers' salary, particularly, in rural area it should be more than in cities.

In our country Teachers are to be the richest people, because they give their lives to others; live for the sake of others, but not for the sake of accounts in offshore.

2. Education in Russia should be continuous and constant: from the lower level – infant school, smoothly transmitting to kindergarten, then – to school with division into work, vocational (colleges) and higher (universities). Further education for those who wish is post-graduate course, doctorate course, and academic course – in fact, limitless. Everybody has to learn including a Teacher at the modern refresher upgrade courses with involvement of Russian Academy of Sciences (RAS).

3. Continuous education should be a harmonic unity of learning and work. It is ultimately necessary to learn and work continuously in different combinations and volumes depending on the age of a person. Figuratively speaking, a person has to learn and work from the first to the last breath.

4. Study presents an increase in awareness of newest natural-engineering and humanitarian sciences in their harmonic unity. It is just unity of natural-engineering and humanitarian knowledge provides increase in human intellect – a base for progressive development of our country. Engineering knowledge is to be combined with the objective outlook – humanitarian knowledge.

Hence, engineering and humanitarian knowledge is the one whole.

5. Complete contemporary infrastructure of the entire education: computerization with use of artificial

intellect software, internet, up-to-date informatics, newest basic and optional manuals in engineering and humanitarian sciences, construction of modern infant schools, kindergartens, schools, colleges, universities and other educational institutions.

Russian education is based on information technologies.

6. Russian education at all levels from the bottom to the top is to be completely free, financed 50% from the state budget and 50% - from the local one, since fee-based education prevents from progressive development of our country and contradicts the RF constitution (Article 43).

In the newspaper «Nauka Urala» (Science of Ural) (2010, №16, p.3) it is pointed out: “The growth of fee-based education share leads to further differentiation of society and again – to retardation of knowledge and industry”. Hence, one needs liquidation of fee-based education.

7. University entrance is to be absolutely free – everyone who wishes can enter a university freely. The only criterion for one's entrance is his/her level of knowledge. Admission committee defines only an entrant's level of knowledge without taking into account his/her awards and achievements.

All entrant's awards and categories: medals, Olympiad prizes, special purpose entrants, magnate's children etc. are of no significance for admission committee – the only important fundamental criterion is an entrant's knowledge level. Entrant's achievements serve for him/her as a means for increasing the level of knowledge that is defined by the admission committee.

Details: any entrant is to apply the documents for the university human resource department and is given an application certificate. He/she passes exams in admission committee with this certificate. Exam papers on each discipline are not kept away, but are put on the internet approximately a year before exam date (about 100 exam papers on each subject with systematic presentation of knowledge for everyone

to have access and prepare on his/her own. Entrant takes a ball from a rotating drum at admission committee, opens it and announces the paper number, takes a notebook, opens exam paper and prepares for exam. Admission committee has no problems with the exam papers. Content of papers is changed once a year after finishing student's acceptance. At the university entrance exams entrants should not have mobile phones. If admission committee finds out some cheating or an entrant goes out from the room under some pretext, his exam paper is changed into a new one – so, one need not spy entrants. In this case it is absolutely forbidden to blitz the entrants from exam, but change their papers that will allow committee to achieve the main goal – to assess every entrant's knowledge objectively.

Assessment of knowledge level at all stages is made using 5-point scale, which reflects it in the most objective way. 10-point, 100-point scales etc. of knowledge assessment are not reasonable, as it is the same as to measure the distance from the Earth to the Moon in millimeters.

Such a free entrance system in universities is the most efficient one, not requiring capital inputs, simple, entirely excluding corruption, and, as a result, permitting for students' acceptance to university only with high knowledge level which is necessary for universities.

One must abandon compulsory university graduate's assignment, particularly special-purpose students. During the first year study students are to find several future positions by themselves. It would permit them to learn purposefully, besides common core universities are to stimulate student's attendance extra lectures, courses, practical classes in their university and other. Because in future education will be completely free, that will permit for intensification of engineering education additionally.

8. Engineering universities of our country would train, as it was before, highly qualified Russian engineers with harmonic unity of engineering and humanitarian knowledge, since only

Russian engineers are a base for modernization of our country's economy.

The number of engineers, technicians, and workers is determined not by employers, but modernization demands. It is conditioned by the fact that in our country only forced modernization with the help of government is possible by means of introducing progressive tax system, but voluntary modernization is virtually unlikely.

Country's modernization is necessary to start with modernization of conscious (mind) and only after that one can turn to modernization of economy.

It is impossible to cover all numerous issues of "The Law of Russian Education". Therefore, the order of its design and adoption is given below.

1. First, special software «The Law of Russian Education» is to be developed that includes all positive points achieved in the education of our country and abroad with their objective analysis and necessary calculations.

2. Based on the software the project «The Law of Russian Education» is to be designed and written in a clear, simple language understandable to everyone.

3. The project of the law is brought up for discussion to introduce corrections and additions. Only after this the first draft of the law is developed that is given to the President and government for discussion, follow-on revision, adoption in its finite version.

4. Supervisor and designer of "The Law of Russian Education" is the Russian Education Committee with participation of the Russian Academy of Sciences.

Such an order of design and adoption of the law is grounded and efficient.

It is necessary to warn that development and adoption of «The Law of Russian Education» will stir up the opposition and get a negative feedback on the part of strongly formed joint: clerks, KGB, magnates, criminals, and an army of "buy-sell" dealers. Since the given law contradicts the American concept of Russia's development, President, government, and discussion of the law by people are our white hope.

It should be repeated that “the Euro-repair in education” with its two-level system and USE are sure to be abandoned, the loss to be calculated including legislative one and one needs to transfer to the Russian education – the highest and best in the world. Such an education is a base for successful development of Russia.

The finite goal of the Russian engineering education is formation of a Human being with a capital letter, progressively developing and living in harmony with the Nature, society, and himself. Russian engineers are a ground for modernization of our country and its progressive development.

Conclusions

1. It is necessary to increase the level of education in Russia and occupy again one of the leading places in the world in this sphere.

2. To increase the education level one must stop «the euro-repair in education» and start the development and adoption of “The Law of Russian Education” including all positive experience both in the country and abroad.

3. The order of development and adoption of the Law is the following: first the Law software is developed, then

the Law project is designed, brought up for discussion, reviewed and given to the President and government.

4. “The Law of Russian Education” is developed by the Russian Education Committee with participation of the Russian Academy of Sciences.

5. “The Law of Russian Education” is necessary and urgent for successful progressive development of Russia. Such a Law will be just, objective, and fully correspond to the basic statements of materialistic dialectics, i.e. scientifically grounded [1].

Thus, progressive development of engineering education in Russia is based on training of highly educated engineers with harmonic unity of engineering and humanitarian sciences, high level of knowledge and intellect. The sense of engineers consists in learning unknown and creation of uncreated on the basis of intellect paradigm – all is for strengthening the unity and progressive development of Russia.

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Ask any Russian: “Would you like your children to get free education at all levels, the best in the world Russian education?” 100% answer “YES” is guaranteed – Then “Law of Russian Education” should be adopted. This is a base of the truth.

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