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SOME CHALLENGES OF SCIENCE AND EDUCATION INTEGRATION IN RUSSIA

The article deals with the peculiarities of modern education development in Russia including the integration of education and science during the after-crisis period as well as state financing of innovation structures in Higher Education Institutions. The article compares the prospects of innovative development of education in Russia with other countries. The author also discusses problems faced by higher education in general and the ways to achieve innovative development in Russia.

"Learning is a great help to virtue and wisdom, but without them it produces only the more foolish or worse men".
John Locke

Starting from 2000 and up to the period of the economic crisis, even despite the positive economic indicators on a national level, there was no steady rising of high tech industry in Russia. Especially the field of nanotechnology experienced negative tendencies. The innovative development strategy still remains marginal for the majority of Russian enterprises.Nevertheless, it should be noted that 25–30 percent of innovation production is exported and the main supplier, as during the USSR as well, is still the defense industry. Most of the high tech export is airspace industry products (60–70 percent), followed by telecommunications equipment, optical instruments, and medical equipment. However, the amount of high tech services export in general is very low. For example, consulting services in the information technology sphere account for 0.3–0.5 percent of the total amount of the exported goods and services [Karaharovsky, 2010].

Many countries passed on to developed industrial society phase in 1970s and currently their specific weight of industry is high enough. As an example, 29 percent of the GDP in Germany, 32 percent of the GDP in Japan, almost 45 percent of the GDP in China, and about 12.5 percent of the GDP in the USA is coming from industry [Inozemtsev, 2010]. Financing in the USA amounts to hundreds of million dollars and is allocated at a wide scale of federal agencies. The latter started investing in nanotechnology scientific research for the Ministry of Defense, for power, justice, transport, environmental agency, NASA, National Institute of Health, and the National Institute of Standards and Technologies.

In addition to the listed bodies there are a number of government agencies that also participate in such kind of research. 3.7 billion USD was allotted to establish the administration for coordination of nanotechnology research and financing nanotechnology programs by the Federal Government in 2005–2008 [Zul'fugazade, 2011].

Much attention was paid to the development of science in the USSR. Many engineers and doctors from former socialist camp were educated in the former Soviet Union. In 1990s many scientists emigrated from Russia and national scientific schools were close to destruction.

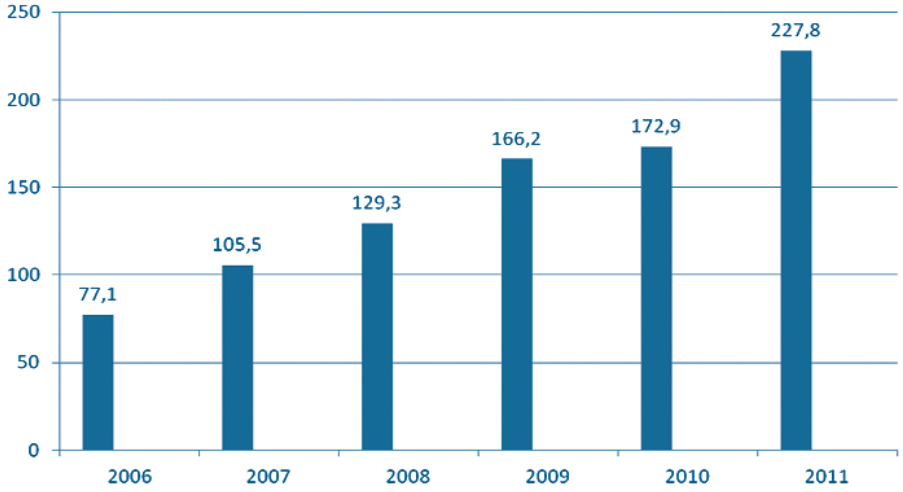
Table 1: Most inventive countries in the world, top 10

Country	2002–2006	2007–2011
Japan	1	1
Switzerland	2	2
USA	3	3
Sweden	4	4
Finland	5	7
Germany	6	5
Denmark	7	9
Taiwan	8	6
Holland	9	13
Israel	10	8
Russia	37	36

Source: The Economist intelligence Unit (2011).

Many challenges facing the government required immediate attention. It was crucial to identify the scale of rational financial support for science and education and also the processes of their integration. It is necessary to note insufficient participation of universities in R&D. They have only 6 percent of the total amount of R&D and less than 10 percent of fundamental research in Russia.

Taking into account this status quo in Russia a number of activities for the integration of science and education were developed within the framework of priority project "Education". The increase in expenses on R&D is represented in *Figure 1.*



Source: Ministry for Defense (2011).

Figure 1: Amount of federal budget expenses on R&D of civil importance in Russia, bln. rub.

First of all, there was a necessity to support innovative university programmes developed by particular universities. To enhance the innovative climate in Russia two business schools were established: the Graduate School of Management based on management faculty of Saint Petersburg State University and the Moscow "Skolkovo" School of Management. It should be noted that the establishment of "Skolkovo" is based on principles of public-private partnership at the expense of private investment (approximately 300 Million USD.). It is remarkable that Skolkovo will be the first University in the world to comprise education, research and entrepreneurial activities *(Table 2)*.

The concept of the funding of the "Education" national project adopted by the Federal Russian Government late in 2005 enabled tens of leading universities to enhance the modernization of education and research facilities, and provided considerable means for the development of education programs and resources, for upgrading of infrastructure.

Table 2: Activities aimed at integration of science and education within the priority national project "Education" (PNPE), million rub.

	2006	2007	2008	2009	2010	2011
Federal budget expenses on higher education (total)	161 660	228 252	280 022	334 796	364 480	365 381
PNPE activities as regards science and education integration	5 500	21 933	15 527	5 315	2 274	10 000
In percent to the total amount of federal budget expenses on higher education	3	10	6	2	1	3
Innovative university education programs	5 000	15 000	10 000	–	3 000	2 000
Development of a national universities network	350	6 384	4 796	4 221	1 274	9 000
Establishment of high level business schools (Graduate School of Management, St. Petersburg)	150	549	731	1 094	1 000	1 000

Source: Ministry for Education (2011).

According to the Federal Russian Government, only certain projects shall be supported, following these basic principles:

- first of all, the education system should provide people with knowledge and skills necessary the new technological challenges;
- any structural decisions should be realized through the development of universities and through certain activities including competitive tenders mechanisms which are supposed to support and introduce only the best projects;

The innovative education programs in universities aim to:

- introduce new and qualitatively modernized education programs into education practices;
- implement new information and education technologies;
- adopt progressive forms of education process management and active training methods, training materials tuned with modern international standards;

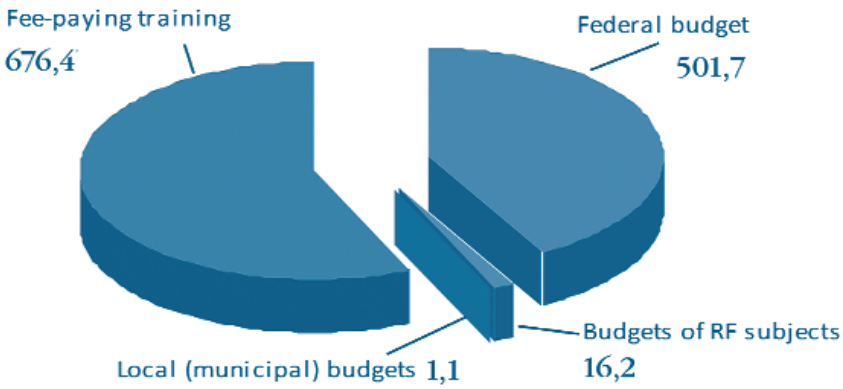
- provide high-quality education within the framework of up-to-date quality management systems;
- integrate education, science and innovative activity;
- form professional competences that makes the graduates competitive at the labor market.

Over more than two hundred year history the Ministry of Education of Russia has undergone many changes. In future it is planned to replace it with two administrative bodies which will be in charge of higher education & science, and school (preschool) education. Such reorganization will take place at the period of a complex demographic situation in Russia. As a result of the social system reconstruction in 1990s the birth rate dropped in Russia. Currently the number of school-age children is decreasing. For example, last year the average annual number of children aged 7–17 decreased by 2.1 percent. These tendencies automatically result in reduction of schools in Russia. It should be noted that currently the majority of schoolchildren decide on their future profession by the tenth year of education. They choose one of the alternatives: to go to a specialized school with advanced study of certain subjects, to get private classes in addition to school studies or to prepare for exams without assistance.

According to Rosstat (Information and publishing center Russian Federal State Statistics Service), the enrollment to state municipal institutions of professional higher education decreased by 134.2 thousand people (by 10.1 percent) in 2010, mainly on the account of full-time students (the reduction was 15 percent). The number of budget places was 438 for 1000 school-leavers as compared to 418 places in 2010 (Ministry for Education). It should be taken into account that the employers' dissatisfaction with the quality of higher education is rising. It is mainly orientated towards at state and the education itself as they pay for education services *(Fig.2)*. A distinctive feature of this period is a steep increase in the number of students of technical specialties. In 2011 the enrollment in the field of humanities decreased by 19 percent (by 7.5 thousand places).

Nowadays post-graduate education is widely spread all over the world. The basis for business-education is an extremely prestigious educational programme, the MBA programs (Master of Business Administration). This additional program mainly depends on the activity of the students themselves and the training is focused on practical interactive classes.

In Russia these programs are becoming widespread since 2004. It was officially adopted at the legislative level as “Master of Business Administration”. The main value of the program lies in the fact that MBA degree gives a powerful incentive to the career development of middle and top managers. Currently this education sector has been formed in Russia and functions according to market rules. Very few experts are capable of identifying the total amount of the business-training market as the companies are reluctant to provide this data. There is an active development of competition support of university and high-tech enterprises cooperation in the sphere of applied research. 31 million RUBs were allotted in 2010–2012 to renew Russian scientific schools in the sphere of applied research and to invite leading scientists to Russian universities.



Source: Rosstat (2010)

Figure 2. Number of places in state and municipal universities financed from different sources in 2010, Russia, thousand units

In 2010 there were 480 applications submitted by 416 enterprises and 157 universities to a contest for cooperation of high school and industry. Moreover, despite the world wide recession and economic crises, more than 700 university-based innovative enterprises have been established in 2011. In 2011 the amount of federal budget means allocated for education was 496 billion RUB (Data of Ministry for Education, 2010).

Taking into account the remoteness of some regions from the center, long-distance learning is actively developing nowadays. However, the number of computers per citizen does not give a sufficient ground for mass introduction of distance learning technologies. One fourth of the world population (1.7 billion people) used internet in 2009. Of course the number of internet users in developed countries greatly exceeds this number. In developing countries four out of five people still do not have any opportunity to use on-line services (Shvetsov, 2010).

Nevertheless, about 20 billion RUB is assigned for IT-education from the national budget of Russia. Due to the dynamic development of the market, there is growing demand for highly qualified specialists. The University of Finances under the Government of the Russian Federation is currently a big training and methodological center of Russia. Since 1987, it hosts the "Training-and-methodical association" (TMA) of higher educational institutions of Russian Federation in the field of finance, accounting and world economics. It comprises more than 700 universities of Russia and CIS that train economists in different areas.

After the signature of the Bologna Convention by Russia, the education field has been expanded, Russian diplomas became recognized, and there is a shift to Bachelor-master system instead of five-year long training of specialists. These activities revealed the need for new education standards.

The European Association of Universities (EUA) is one of the leaders of the higher education domain in Europe. The Association represents the interests of many universities and is a consultant of the EU Commission. In 2011, the University of Finances became a member of EUA.

As a new practice, it has become customary to invite "visiting professors" to deliver lectures at universities in Russia. Amongst others, Noble Peace Prize laureate Muhammad Yunus, the well-known Polish politician, economist and scientist Grzegorz W. Kołodko, Director General of the oil-and-service company "Kungur Holding" Paul Ostling, German scientists P.-G. Schmidt, D. Haase, A. Pole, a Swiss banker Frener, and professors from leading Spanish, Italian, French, German universities. Together with partners from Bloomberg University (USA) and the University of North Umbria (Great Britain) a joint Bachelor education program for economists was designed. It meets the requirements of both Russian state education standard and the inspectorate in the sphere of education in the USA and Great Britain.

The Academic Council of the University under the chairmanship of the Rector, Professor M. A. Eskindarov, made a decision to provide training process in a trimestrial system. It is significantly different from the traditional training system in Russia as that is following a semester scheme.

On 25 October, 2010, a group of scientists from the University of Finances were given the award of the Government of the Russian Federation in the sphere of education for a series of scientific works, training-and-methodical and applied materials on establishing and developing continuous training in the field of finance.

The development program of the University of Finances designed for the period 2010–2015 claims that the strategic goal of the University, the main vector of its development is the establishment of innovative consulting and design center that could rank among the leading R&D and educational institutions in Russia. The program also aims for maximum facilitation of national economy modernization within the framework of educational, scientific and international programs in the sphere of training highly qualified finance and banking specialists.

The ongoing changes in the world and in Russia, unsolved old and new contradictions reveal the need for profound modernization and humanitarization not only in the training system but the educational system as well. It is a twofold process. At the same time modernization should not turn down the acquired traditions of educational work [Eskindarov et al, 2011].

The sphere of education in Russia experiences large-scale implementation of up-to-date high tech means of processing, dissemination and use of information. The former fellow citizens who successfully work abroad consider that their achievements owe to a high level of Soviet education.

It should be also noted that in the period of world economic crisis the state provided significant cash flow to the sphere of science and education which mostly influence the diversification of national economy in the aspect of innovative development. The adoption of the new law on education is supposed first of all to enrich the strategic goal of the country: to become one of the most competitive world powers due to innovations in society and economy.

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