TATIANA GOUNKO

9. REVIVING RUSSIAN SCIENCE AND ACADEMIA

In October 2010, the Royal Swedish Academy of Science announced the laureates of the Nobel Prize in physics. Andre Geim and Konstantin Novoselov jointly received this award for groundbreaking experiments regarding the two-dimensional material called graphene, which, according to science experts, will have a wide range of practical applications in the future. The research duo has been working together for over a decade. Born in 1974, Dr. Novoselov is the youngest scientist to be awarded the prestigious Nobel Prize since 1973. He first worked as a Ph.D. student with Dr. Andre Geim in the Netherlands and subsequently joined him in the United Kingdom. Both scientists are currently conducting their research at the University of Manchester. Needless to say, the University of Manchester administration expressed its delight with the news by calling the prize "a truly tremendous achievement" and "a testimony to the quality of research that is being carried out in Physics and more broadly across the University" (University of Manchester, 2010, p. 1).

Most of the press releases and on-line publications devoted to the prize-winning duo briefly mentioned that Drs. Geim and Novoselov were Russian-trained researchers. Dr. Geim, who had received his doctorate at the age of 29 and worked for a number of years as a researcher at the Institute for Microelectronics Technology in Chernogolovka (Russia), left the country in 1994 to continue his research career in the Netherlands and later in the United Kingdom. Dr. Novoselov graduated from the Moscow Physical-Technical University in 1997 and joined Dr. Geim in 1999 at the University of Nijmegen, the Netherlands, where he received his doctorate in 2004.

As the news about the Nobel Prize winners was spread across the international media, Russia cheered but also recognized its losses from a devastating brain drain after the demise of the Soviet Union and subsequent economic crises, which forced many scientists to leave the country. Russian President Dmitry Medvedev said that he was pleased that Russian-born scientists had won the Nobel Prize in physics, but regretted that the laureates were currently working abroad. Mr. Medvedev criticized the government for failing to improve research facilities and to provide attractive conditions for scientists to work in the country after graduation. According to Antonova (2010), hundreds of young scientists, especially those working in applied fields that require expensive equipment and experiments, have left Russia and continue to leave in order to continue their scientific work. Dr. Novoselov, the youngest Russian national to ever win the Nobel Prize, also holds a British passport. Dr. Geim has not worked in Russia since the early 1990s and is now a citizen of the Netherlands. President Medvedev said that, Russia was offering "decent grants" to

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scientists but was still struggling to maintain the quality of its research facilities. Most laboratory facilities have not been improved in recent years and are critically outdated.

Russian scientists, thrilled about their former colleagues' achievement, also acknowledged the pitiful state of Russian science, which suffers from a lack of financing, archaic research facilities, bureaucracy, misguided funding, as well as the scientists' "living and working misery" ("Nobel Prize Win," 2010). The announcement of the Nobel Prize winners restarted the debate about the state of Russia's research and higher education system and the need to modernize the system and to reverse the brain drain. While nobody knows exactly how many researchers have left Russia during the past two decades, the government estimated that since the 1990s, over 35,000 scientists have left Russia and that approximately the same number, although officially affiliated with Russian institutions, are permanently working abroad. According to another official report, between 1990 and 2005, the number of researchers dropped by 58 per cent, so that Russian science lost more than one million people to internal and external brain drains. The emigration of scientific personnel (even of a small number of scientists) was recognized as a grave loss for the country. Some scientists moved abroad not only to improve their material conditions, but also to have a chance at self-realization. The exodus of scientists is greatly affecting the quality of Russia's intellectual capital and will have a dramatic impact on the future development of the nation ("Brain drain issues," 1994).

Despite two decades of social and economic reforms and a number of positive developments in the education sector and sciences, the Russian government has not been able to reverse the negative situation in research and the sciences. While many projects have been introduced to restructure Russia's science sector, scientists are still expressing their concerns about the on-going brain drain and the "looming collapse" of science in the country (*RIA Novosti*, 2009). Research institutions and universities are struggling to preserve the traditional strengths of the academic system while trying to adapt to the requirements of the new order. The deteriorating situation of academia is caused primarily by the lack of appropriate financing that has plagued Russian science and universities since the 1990s and by the absence of effective research structures. These issues are directly connected to the recruitment of a new generation of scholars and are likely to have long-lasting effects on Russian higher education and science.

The purpose of this chapter is to analyze the current government initiatives designed to integrate research and teaching into Russian universities and to restructure the science and higher education sectors. This investigation is preliminary in that it addresses the current legislation and policies guiding these processes, thereby establishing the basis for the subsequent empirical work to examine the implementation of these policies and how Russian academics perceive them. As the process is still continuing, a final assessment of the results of these programs and initiatives cannot yet be written. My intent is to discuss recent government initiatives to establish national research universities and integrate research and teaching vis-à-vis the global context

in which top research universities are increasingly becoming an integral part of the global higher education environment. According to the World Bank tertiary education coordinator, Jamil Salmi (2009b), top research universities possess: (a) a high concentration of talent (faculty and students); (b) abundant resources for research and learning; and (c) favourable governance that encourages leadership, strategic vision, innovation, flexibility, and resource management without cumbersome bureaucracy. In reforming higher education and establishing research universities, many countries are invariably looking at successful research universities emulating an informal global research model, which is essentially based on the U.S. research university (Altbach & Salmi, 2011).

In discussing the current initiatives, I also draw on my personal experience in Russian and Canadian universities. For 10 years, from 1990 to 2000, I held tenure at a Russian university which I left in 2000 to pursue a doctoral degree in Canada. Since 2001, I have been engaged with Canadian universities, both as a graduate student and faculty member. My experiences allow me to appreciate the challenges associated with the integration of research and teaching in Russian universities and the problems facing academics during the implementation of the government programmes.

Publicly available policy documents provided the main data for this discussion. The examined policy documents include the *Research and Pedagogical Cadre for Innovative Russia* (2008), *the Law on Education* (1992), *the Federal Law on Higher and Post-Graduate Professional Education* (1996), and *the Strategy for the Development of Science and Innovation in the Russian Federation until 2015* (2006). Additional information was obtained from primary and secondary sources such as Russian government press releases, on-line communications, newspaper publications, and research articles related to science and research.

The legal basis of higher education in Russia lies in the country's federal laws on education and higher education, as well as the labor laws and the Constitution of the Russian Federation. During the past several decades, education legislation has been often amended to reflect new government initiatives in response to developments in the global economy and tertiary education.

THE STATE OF RUSSIAN SCIENCE AND RESEARCH

In order to appreciate the challenges facing Russian science today, one should be aware of its unique organization and structure. In the Soviet Union as well as in the present-day Russia, scientific research has been distributed among three so-called "pyramids": the university system, the academy of sciences system, and the industrial and defense system (Graham & Dezhina, 2008). Most fundamental research has been conducted by the Academy of Sciences, the most prestigious scientific institution in the country. Universities have had a narrower pedagogical mandate and carried out mostly applied research. This research organization is noticeably different from that found in many Western countries such as Canada and the United States, where universities perform most of the fundamental research.

In the Soviet Union, for decades, the central government and its ministries managed universities, which were fully subordinated to the state and had little autonomy in academic matters. The state determined student quotas, the number of academic positions, and the curriculum; it also set university budgets, and faculty and staff salaries. The centralization of power and prominence of the communist ideology significantly limited institutional self-governance and academic freedom. To receive an academic appointment, a candidate was often required to have a recommendation letter from a communist party organization at the higher education institution to which she or he was applying (Smolensteva, 2003). Under the state-centered model, which shaped higher education in the Soviet Union and Russia, universities have been considered state-operated institutions. According to Dobbins, Knill, and Vögtle (2011), universities in such systems are "subject to the formal administrative control of the state and granted relatively little autonomy" (p. 6).

ISSUES OF THE PAST AND THE PRESENT

During the Soviet period, the higher education system was uniform and centrally planned and governed. Before the 1990s, the country had approximately 40 classical universities and hundreds of polytechnic and specialized institutes offering undergraduate and graduate degrees. In the past two decades, many new types of institutions, both public and for-profit, have been opened in the Russian Federation. According to the Russian education statistics, in 2005, Russia had 328 state universities, 43 of which were members of the Association of Classical Universities. Since 2006, the government has attempted to consolidate state universities by establishing new categories of institutions such as "the national research university" and "the federal university." The state officials appoint the rectors of the federal universities. The government envisions that a new university model and new systems of management will be implemented throughout Russia. The federal universities will become integrated complexes of education, science and business, as well as centers of innovation, technological development and personnel training. By establishing these Russian 'ivy league' universities and concentrating its resources, the government hopes that Russian universities will be able to rival the world's best universities (Holdsworth, 2008).

In Russia, the failure to fully fund higher education in the 1990s negatively affected academics, who often were not paid on time and were forced to look for additional employment outside of universities and, in some cases, to leave the country. In fact, the government's policy for wages and salaries was cited as one of the most important factors causing the intelligentsia to emigrate (Naumova, 2005; Naumova & Jones, 1998). Financial problems, insufficient and delayed payments, and uncertainties undermined the dedication of higher education staff to their institutions and profession. That higher education institutes continued to turn out high-quality graduates for some time was due largely to the dedication, professionalism, and ingenuity of the professorate. Russian academics have been

considered a major asset of the Russian higher education system (OECD, 1998). However, in order to survive, many professors had to seek employment outside their universities, supplementing their insufficient income by teaching courses in private institutions and tutoring prospective students. Researchers (e.g., Kastueva-Jean, 2006; Kniazev, 2002) pointed to the distressing situation in higher education where the wages of young professors were below the subsistence level. Consequently, those who are able to find better-paying jobs are leaving the state-funded universities. The low salaries paid to academics have already forced many to leave universities and may prevent future generations of scholars from choosing research and teaching careers. As some experts have argued, with such wage policies in place, the university system will inevitably experience a period of steady decline in its quality as well as decreasing control over key academic functions (Altbach, Reisber, & Rumbley, 2010; Naumova, 2005).

In the new millennium, the Russian government announced its return to funding education and promised to increase budget allocations for higher education and research. While the government has been constantly stressing the need to implement new mechanisms for the financing of higher education and science so that the system can better adapt to labor market demands, the problems of inadequate financing and low university wages still remain unresolved. Dr. Molodin, the Deputy Chair of the Siberian Branch of the Russian Academy of Sciences, stated that Russian teachers and professors had been working under such inadequate conditions that monuments ought to be raised to honor these educators. In his opinion, unless educators are fairly paid, no radical changes will ever take place (Shcherbakova, 2002). The 2004 sociological survey showed that the main reasons why Russian scientists and intellectuals were choosing to emigrate included low wages, the decline in the prestige of intellectual work, lack of opportunities for professional growth, absence of social safety nets, and concerns for their children's future (Ivakhnyuk, 2006).

Other serious issues affecting Russian universities include the aging academia and low internal mobility. According to the 1999 OECD report, at some universities, the average age for professors was 60 years, which is the official age of retirement for males in the Russian Federation; the females' retirement age is 55. Since 2002, the number of researchers between the ages of 30-49 has decreased significantly (Government of the RF, 2008), and the teaching cohort aged 35 to 50 is the cohort most likely to leave state educational institutions. Due to the existing salary level and working conditions, universities have difficulty attracting talented graduates to junior academic positions.

Although modeled after the French and German systems, the Soviet science and higher education establishment had unique institutional characteristics. The distinct structure was a result of the centrally planned economy and direct state control over education. University teaching, scientific research, and industrial production were institutionally separated, which later proved to be detrimental to research activities in these institutions and to Russia's research and development in general (Gounko, 2008). With rare exceptions, universities and various polytechnic institutes were

involved primarily in teaching. Most fundamental research was conducted in the specialised research institutes of the Academy of Sciences. For many years, national and international bodies criticized this situation. Specifically, in the 1999 OECD report, the review team noted that the quality of Russian higher education had been negatively affected by the absence of strong financial support for research, the limited infrastructure, and the intentional separation of research and teaching.

In the past two decades, the organization of Russian science, its integration into universities, and financing has been on the government agenda continuously. As a result, the governance system of higher education and science has been streamlined. In April 2004, Russia's Cabinet of Ministers established a new Ministry of Education and Science with four internal bodies: the Federal Agency of Education, the Federal Agency for Science and Innovation, the Federal Education and Science Supervision Service, and the Federal Service for Intellectual Property, Patents and Trademarks. The Ministry of Education and Science is responsible for developing state policy and drafting legislation, approving the budget, staffing, and performance indicators for subordinated units; the Federal Agency of Education deals with policy implementation, property management, budget disbursement, and student quotas. The Federal Education and Science Supervision Service monitors and controls reforms and outcomes. According to Timoshenko (2011), the merger of the education and science portfolios into a single Ministry of Education and Science was intended to facilitate the integration of research into universities. Among other measures to promote this integration, the government established research universities and university complexes to link research, innovations, and training. By incorporating various research and training organisations and industrial firms into leading research universities, the government hopes to create 'centres of excellence' that will transform Russian higher education and research into a world-class system.

Despite these continuous efforts to reform higher education and science, the government has lacked a clear strategy for higher education reform. The 2007 OECD report noted that Research and Development (R&D) in higher education institutions faced many unresolved problems including weak cooperation among science institutions, education institutions, and industry; lack of appropriate financing for R&D, and the business sector's low involvement in funding science and research in HEIs; inadequate research and development infrastructure; absence of a legal framework and an effective evaluation system for institutional research; and insufficient commercialization of the R&D activities conducted by HEIs.

CURRENT GOVERNMENT INITIATIVES

The long-term objective of integrating research and teaching was stipulated in the *Strategy for the Development of Science and Innovation in the Russian Federation until 2015* (adopted in 2006). According to this strategy, a number of specific initiatives would be implemented. These initiatives were designed to support research and teaching in HEIs; laboratory infrastructure improvement; research grants for

young scholars; research teams and students' research in HEIs in order to attract young scientists; the establishment of research-teaching centres and the integration of research, education and industry; and the development of Ph.D. (*aspirantura*) programmes and institutional management. By implementing specific measures to broaden research and innovation activities in universities, university centres, and HEIs, and to increase infrastructure development and improve research and teaching based on long-term contracts, the government hopes to raise leading universities' share in research and innovation to the level found in the major developed countries.

FEDERAL UNIVERSITIES AND NATIONAL RESEARCH UNIVERSITIES

In the beginning of the 2000s, the Russian government grew concerned about the large number (approximately 1000) of universities and other institutions that had been opened across the country. Some of these institutions were of questionable quality and were essentially "diploma mills." At the same time, the pressure to build world-class universities, which are considered essential for global competitiveness and economic growth, and the proliferation of international league tables in the past several years prompted many governments to provide additional funding for various "excellence initiatives" (Altbach & Salmi, 2011). According to Salmi (2009b), a government can follow three basic strategies to establish world-class universities: upgrade a small number of existing institutions (pick winners); merge and transform existing institutions into new universities (use the hybrid formula); and create new world-class universities from scratch (using the clean-slate approach).

Following these trends, in 2006, the Russian government started to consolidate higher education institutions by merging several institutions across the country, establishing new federal universities, and initiating a competition for federal funding among the existing universities. The government wanted to create a new university model that could be replicated throughout the country and to concentrate its resources on the top institutions that would climb up the league table of world universities (Holdsworth, 2008).

Since 2006, a Federal University has been established in each of the seven federal districts of Russia. The new universities are the Southern Federal University, the Siberian Federal University, the Northern (Arctic) Federal University, the Volga Federal University, the Urals Federal University, the Far Eastern Federal University, and the Northeastern Federal University. Moscow State University and Saint Petersburg State University, two of the oldest and most prestigious institutions, acquired Federal University status in 2007 (Timoshenko, 2011). The strategic mission assigned to a Federal University is to form and develop competitive human capital in the federal districts in accordance with the federal and regional programs of social and economic development.

In addition, through a government-held competition between existing universities, 27 institutions were granted the status of a National Research University. According to the National Training Foundation (2012), National Research Universities (NRU)

are expected to generate knowledge, train highly qualified specialists, develop new programs for life-long learning, conduct fundamental and applied research, and transfer knowledge into the national economy. The integration of teaching and research makes these universities central to the development of the knowledge economy and the human capital necessary for Russia to compete in the global economy.

Since federal and national research universities are crucial to integrating research and teaching and ensuring the competitiveness of the Russian economy, the government has pledged additional funding for them. Forrat (2012) suggested that the shift in the government funding policy in the second half of the 2000s may be explained by the concerns about the low quality of education and the inefficient use of public resources. Instead of wasting limited resources to support institutions providing a poor education, the government decided to fund a smaller number of leading universities which could carry out world-class research and teaching, contribute to the modernization of Russia's economy, and represent Russia internationally.

It is expected that the new university model will be adopted throughout the Russian regions. The universities will introduce new management systems and integrated complexes of education, science and business, and build centres of innovative technology and human capital development. According to the government forecast, within 5-6 years, a new university model will be adopted by at least 10 leading universities in Russia, and, by 2020, Russian universities should be among 100 best universities in the world (National Training Foundation, 2012).

ADDRESSING THE PROBLEM OF ACADEMIC PERSONNEL

The issue of academic personnel development is central to the improvement of the knowledge and economic potential of Russia. As Altbach and Salmi (2011) argue, world-class universities require well educated academics to perform their teaching and research responsibilities at the highest level. Since the 1990s, the problems of the aging academia and the brain drain have permanently figured in the Russian literature on science and higher education, but the Russian government waited until 2008 to adopt a specific program to attract a new generation of scientists to the nation's universities. Acknowledging the need to preserve research traditions in a wide range of disciplines and to avoid a "catastrophic" situation in science, the government proposed a series of measures to support research and innovation and increase the pool of talented academics.

The Ministry of Education and Science introduced a Federal Programme called the Research and Pedagogical Cadre for an Innovative Russia to promote the training of scientists and pedagogical personnel and to attract and retain promising young specialists in the sciences, education, and ICT. This programme complements another government initiative, the Strategy for the Development of Science and Innovation in the Russian Federation, which deals with reforms of the administrative,

organizational, and legislative structures of public research and higher education institutions. By allocating over 90 billion rubles (approximately 2.3 billion Euros) between 2009 and 2013 for the Federal Programme, the government expects to achieve the following results: (1) to raise the quality of research and teaching personnel, (2) to attract young talented researchers, (3) to increase the number of researchers and university professors with the highest qualifications (with Candidate of Sciences and Doctor of Sciences degrees), (4) to raise the quality of research publications, and (5) to increase the number of research and educational institutions implementing the methods of the international top research universities. Approved by the Russian government in July of 2008, the programme is expected to create the necessary conditions to promote the renewal of researchers and the professorate by attracting young specialists to the fields of science, education, and high technology. In the opening paragraphs of the document, the government acknowledges the grim situation in Russian science and higher education. Despite many previous initiatives to attract young people to academia, the government has not been successful in combating the external (to other countries) and internal (to other sectors of industry) brain drains and in making science and higher education more appealing to the new generation of researchers. As these issues cannot be resolved solely by market mechanisms, which the federal government once viewed as the only means to make education and science competitive in the global market, the current government argues for a comprehensive approach to the renewal of Russia's science and research.

In this regard, Minister of Education and Science, Andrei Fursenko, stated that in order to make higher education attractive to the new generation, the following priority issues should be addressed. First, researchers' and professors' salaries should be increased. Second, working conditions should be improved; modern research facilities and access to international research should be made available to young specialists to fulfill their professional aspirations. Third, opportunities for professional growth and career advancement should be provided. Finally, living conditions for young scientists and professors should be improved (Government of the RF, 2008). The success of the program will depend on addressing these issues, which Russian sociologists consider to be of the outmost importance for young researchers. Mr. Fursenko noted that the government was aware that salaries and conditions in science research and higher education needed to become comparable to those in the economically developed countries. Career progress should be based on clear procedures and reflect real professional achievements. New specialists should be able to acquire their chosen position via a fair competition.

One of the stated measures of the Programme involves the improvement of internal staff mobility in research and educational centers. The government proposed the development of comprehensive hiring and evaluation procedures in order to increase the number of young talented people in science and academia. Another important issue directly related to internal mobility is the availability of housing for novice researchers. The government pledged to provide funds for new facilities and halls of residence at 28 universities across the Russian Federation.

The proposed reforms support the overall socio-economic development of Russia "in response to the economic demands and science innovation policy" (Government of RF, 2008, p. 7). The government wants to foster effective cooperation between science and higher education and private sector organizations in order to bring the Russian economy in line with other knowledge-based economies. The active participation of scientists and university researchers, whose preparation and retention must accompany structural reforms, is considered a necessary requirement. In order to attract and retain young specialists in the fields of science, higher education, and technology, the authors of the programme proposed four sets of measures. The first set promotes research projects by teams that include senior and young researchers from university research centres; fosters researchers' mobility between institutions; invites international scientists to participate in research; and supports the retention and renewal of researchers and academics. The second set of measures, designed to develop an infrastructure for retaining young specialists, includes organizing national and international conferences and academic competitions among young scientists, sharing information about research and education, supplying leading research institutions with state-of-the-art equipment, and establishing core National Research Universities. The third set of measures is intended to ensure investments for training science and higher education specialists and for building appropriate housing (e.g., halls of residence). Finally, the fourth set of measures is intended to ensure the programme's implementation by providing technical information and analytical support for government grants and contracts (NTF, 2012).

In April of 2010, the Russian government approved the allocation of 3 billion rubles (approx. 72 million Euros) from the federal budget, with an additional 5 billion to be allocated in 2011, and another 4 billion in 2012 for the program called the Measures to Attract Leading Scientists to Russian Educational Institutions. According to the official government press release, the program funds would be made available through a competitive grant process. Scientists of all nationalities and countries of residence would be eligible to apply. Upon the approval, the researchers would be expected to form a research team which would include members from a Russian host university who had advanced academic degrees, as well as graduate and undergraduate students. Applications would be peer- reviewed in accordance with international standards. The grant board consisting of internationally renowned Russian scholars would determine the priority research areas and evaluate the submitted proposals. The government officials stated that the program would provide up to 150 million rubles (approx. 3.7 million Euros) for each research project in 2010-2012, with opportunities to extend the research period by another 1-2 years (Ministry of Education and Science, 2010).

Since the beginning of the program in 2009, a number of research grants have been awarded to international scholars and teams of researchers. In October 2010, the Grant Council announced the first 40 winners, who had been given "mega-grants" through the open public competition which had received more than 500 applications. The selected winners, conducting research in chemistry, biology,

mathematics, physics and mathematics, were both Russian and foreign nationals. These researchers were leading investigation teams in various national universities. In 2011, the Grant Council awarded 39 grants to a second group of international scholars that included two Nobel Prize laureates.

The Grant Council identified the specific research fields that would receive government funding: astronomy and astrophysics, nuclear technology, biological sciences, ICTs, mathematics and engineering, medical sciences, nanotechnology, psychology, economics and sociology, physics and chemistry. The preference was given to the so-called "STEM" (science, technology, engineering and mathematics) fields.

In May 2012, in one of the first decrees signed by President Putin, the Russian government expressed its commitment to continue the current course of reforms. Issues addressed in this decree included the funding of science and higher education: they were to receive more federal funding to support research, and, by 2015, such funding would account for 1.77 per cent of the GDP. These measures were intended to increase research productivity and the number of publications in internationally recognized journals by 2.44 percent.

DISCUSSION AND IMPLICATIONS

Russia's economic instability and the erosion of the research and higher education resource base have negatively affected vital areas of the education system, institutions, and the people within their walls (Scott, 2002). Although the government guaranteed the financing of research and higher education, budget allocations steadily declined throughout the previous two decades. While during the last several years, the federal government has provided additional funds for institutions and scholars, an academic career in Russia rarely provides a quality of life compatible with that in Western countries. Regarding Russia's reform implementation, the World Bank (2004) stated that the fossilized governance system for higher education, at both the federal and the institutional levels, was closed to the external environment and to university insiders, and was a major barrier to the modernization process. Merely updating legal and regulatory frameworks is not enough to create a new research culture. New concepts and pronouncements will not change entrenched practices, which *could* be changed by sustained efforts and long-term commitment.

In Russia, the insufficient financing of higher education has led to a deteriorating infrastructure, "catastrophic" conditions, "historical and cultural trauma," and a brain drain. Researchers (e.g., Bain, 2001; Bucur & Eklof, 2003) noted that for more than a decade, at many Russian universities, the professors had been demoralized because most of the faculty had been paid minimal wages; peer reviews and merit-based competitions for research money were virtually unknown, and accounting procedures were laughable. In order to ensure the survival of their families, most able and talented faculty were forced to take on two or three jobs in addition to "the one that once used to pay their bread" (Neave, 2006, p. 282). In fact, to earn a

living, the majority of Russian academics had to work at several jobs. Inevitably, this situation undermined the quality of teaching and research in universities.

Despite the policies adopted to attract the leading researchers to Russian universities and, to encourage the return of those who have left, some experts (e.g., Abankina, 2010) argue that the current federal programme, like the previous ones, does not include strong mechanisms for implementation. According to Professor Abankina (2010), after the programme's introduction, faculty salaries at the leading universities did not increase even though low faculty compensation results in the most talented graduates leaving either academia or the country. The university administrators controlled most of the available resources and used them to improve the university infrastructure. While infrastructure spending is important, the retention of the leading academics, researchers and post-graduates is equally important for Russian universities. So far, no significant changes have taken place at the leading federal and research universities.

The OECD (2007) report stated that the impact of the socio-economic changes and reforms on the human resources in the HEIs appeared to be negative. The evidence for this conclusion was the decline in the professors' prestige, primarily due to low wages, the decrease in young teachers and, as a result, the aging teaching staff, heavy teaching loads, and inadequate resources, which seriously inhibit the pursuit of research in many university departments. The decline in incomes and the quality of living has also led to a sharp increase in the teaching loads of Russian academics, who often have several jobs. Their teaching loads remain high compared to those in Western research universities where professors have modest teaching responsibilities and enough time to undertake and publish research. Altbach and Salmi (2011) pointed out that where teaching loads are relatively high, as is the case in many developing countries, research commitment and productivity tend to be relatively low. According to Froumin (2011), some leading Russian universities with close contacts with the Academy of Sciences have been able to attract researchers from the Academy to become part-time professors and engage graduate students in research activities. However, such cases are exceptions, as in most Russian universities, the integration of teaching and research is slow due to the existing barriers.

According to the OECD (1999), the teaching loads of university teachers should be at the average level in an international context, in order to reduce teaching responsibilities and provide time for research and independent work. Presently, the Russian education laws stipulate a high teaching load for academics, up to 900 hours per annum. The teaching load in Russian universities is calculated based on the amount of time spent on course preparation and actual teaching hours including those for lectures, seminars, and student advising. Approximately two-thirds of this load is comprised of actual time spent in classes. In my personal experience at Yakutsk State University, which has become a Federal University (and is currently called the Northeastern Federal University), my teaching responsibilities left no time for research and professional development. Moreover, the university did not have

separate professors' offices, which professors need to prepare for classes and conduct research. Offices were allocated for deans and department chairs, while instructors had to share a common office where they could leave their class materials. Unlike the institutes of the Academy of Sciences, most universities have limited research space for professors and students.

Since the 1990s, universities have been giving faculty five-year employment contracts, which also inhibit the current attempts to attract and retain talented faculty. As department chairs in Russian universities have considerable influence in hiring and promotion, cases of power abuse have occurred. At the same time, a critical factor in the Russian system is that competition for positions is generally conducted internally, whereas North American universities place their advertisements and hire professors internationally. Traditionally, Russian universities hire their own graduates and, thus, reproduce themselves and protect internal norms. Hiring for administrative positions is also done similarly. Due to internal recruitment and regional disparities, faculty mobility in Russia remains rather limited. According to Stromquist et al. (2007), in Russia, the labour market is more regional than national, and the mobility of academics across regions is limited. The low supply in the academic labour market can also contribute to the relative homogeneity of academic staff, because the absence of competition imposes no pressure on the profession and thus does not foster change. Policy makers believed that the present system, which grants no permanent contracts or academic tenure, would create an open competition to enhance effectiveness, renewal, and accountability. However, not only has this practice changed virtually nothing, it has made academic jobs even less attractive to the younger generation due to the lack of job security and the threat of losing an existing position if one's opinion differs from that of the administration.

Academic mobility is also limited in Russia because of the traditional distribution of higher educational institutions (most of them are in the central part of Russia, in Moscow and St. Petersburg), patterns of migration, difficulties with finding accommodation, and the culture of inbreeding (defined as hiring faculty with degrees from the local institution), which is widely accepted in Russian universities. While extensive empirical evidence suggests that inbreeding negatively affects faculty promotion, academic productivity and professional recognition, it is rarely discussed in Russian universities. According to Yudkevich and Sivak (2012), not only is inbreeding considered a normal practice in Russian universities, but 62 percent of department chairs, who usually influence employment politics, believe that universities should hire their own graduates. These institutional practices have been in place for many decades and are likely to continue due to the existing hiring policies.

Altbach and Salmi (2011) argued that for a research university to be successful, "the academics must enjoy conditions of employment that will permit them to do their best work" (p. 19). These conditions include full-time employment with adequate salaries to support themselves and their families and reasonable security

of tenure. Currently, tenure contracts are not permitted under the Russian legislation (Froumin, 2011). According to the OECD (2007), the low prestige of research and university teaching, the weak regulatory environment for individual contracts, and the gaps in pension legislation adversely affect university staffing in Russia (OECD, 2007). These conditions make the task of attracting and retaining talented academics and the implementation of current government initiatives extremely difficult.

Regarding the current initiatives, Fedyukin and Froumin (2010) noted that no government document clearly states the goals and performance indicators for federal and national research universities. Two years after establishing the first two federal universities, the Ministry of Education and Science provided a vague description of the federal university programme, and the Ministry did not write specific development programmes for the first two federal universities until *after* granting them their new status and funds. Moreover, Fedyukin and Froumin argued that the choice of national research universities lacked transparent criteria and procedures. Although the extra resources that the universities received were supposed to improve teaching and research, there is evidence that the universities did not spend their new funds on faculty and graduate students. In evaluating the implementation of the latest government initiatives, Professor Abankina (2010) suggested that the performance of the universities was rather disappointing as they had not implemented any structural changes or new management approaches, and also had failed to invest in human resources. These failures clearly indicated a gap between the policy goals and the policies' actual implementation. To eliminate this gap, universities would need to adapt modern resource management, develop their research capacity, change the faculty compensation system, and focus on attracting leading researchers and young academics.

Despite the generous government spending on research grants for international scholars, the mega-grant recipients expressed their concerns about a number of issues including visa applications, endless paperwork, spending restrictions, lack of equipment and qualified staff and administrative support, issues related to copyright and application of their research in Russia, and uncertainty about schedules (Krainova, 2011). For example, as many as eight researchers gave up their grant and did not begin working at the laboratory of algebraic economics at the Higher School of Economics because they "were unable to cope with … filling out endless papers" (p. 2). While everybody agrees that the general idea of the grant programme is necessary for the development of Russia's research potential, old legislative frameworks and red tape make this programmme's implementation grueling. This problem brings to mind the words of the Russian- born 2010 Nobel Laureats, Andrey Geim and Konstantin Novoselov, who described the education received in the Soviet Union as "one of the best in the world," but also publicly refused an invitation to work in Russia, saying that they were happy with their well-oiled research laboratory in Britain. Specifically, Dr. Geim noted that Russia had "neither the facilities nor the conditions" for research, and that Russia's "bureaucracy, corruption and idiocracy" were unacceptable (*Moscow News*, 2010). These poignant remarks indicate the

amount of work still required in order to make Russian science attractive to leading international researchers.

CONCLUSION

At the turn of the new millennium, the Russian government introduced a number of initiatives meant to align Russian higher education and science with worldwide trends including "the relentless logic of the global knowledge economy" (Altbach & Salmi, 2011, p. 14), the expansion, internationalization and competitiveness of higher education, the growing academic mobility, and the dominance of the research university model. Specifically, the government merged its education and science portfolios into the Ministry of Education and Science in order to integrate education and research and foster economic innovation and competitiveness. In responding to the rising competition among world-class universities, the government has established new categories of leading universities, Federal Universities and National Research Universities, which are receiving the targeted support. In addition, the government has introduced competitive grants to attract international scholars and raise the profile of science and research, and has adopted a set of policies to revive Russian academia.

While it is still too early to evaluate the full impact of these programmes, one can appreciate the efforts required and the barriers to their implementation. One of the significant barriers to Russia's modernization process, noted by the World Bank (2004), is the fossilized governance system of higher education, both at the federal and institutional levels. Further reforms in funding, management, organization and governance are still needed, especially in merging teaching and research and continuing efforts to develop leading research universities, where both STEMs and social sciences are treated as equally important (Graham & Dezhina, 2008).

Because the academic community is central to any research university, creating the necessary conditions for attracting and retaining talented specialists is a work in progress that involves a long-term commitment at the national and institutional levels. This commitment is especially important in an environment where university professors often collaborate with colleagues from different countries and are becoming increasingly internationally mobile. Research examining the challenges associated with the implementation of the new government initiatives and their implications for institutions and academics will be particularly valuable for assessing the impact of the reforms.

For the time being, the government must continue its work in this direction as the cultivation of Russian scientists and academics cannot be left to the market. The revival of Russian science and academy calls for a comprehensive approach and the participation of all stakeholders. If the professional and living conditions of Russian academics are not comparable to those of the academics in leading international universities, Russia will neither be able to reverse the loss of its intellectual potential, nor will she dream of having its own Nobel Prize laureates.

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